1992

Tiger Team Assessment of the Naval Petroleum and Oil Shale Reserves Colorado, Utah, and Wyoming

United States Department of Energy

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Environment, Safety and Health

Tiger Team Assessment
of the
Naval Petroleum and Oil Shale Reserves
Colorado, Utah, and Wyoming

July 1992

COMPLETED
DATE: September 9, 1992
REPLY TO: EH-5; Gilbertson: 6-2398
ATTN OF: SUBJECT: Preparation of the Final Corrective Action Plan for the NPOSR-CUW Tiger Team Assessment

TO: James Randolph
Assistant Secretary for Fossil Energy

Attached is the Final Report for the NPOSR-CUW Tiger Team Assessment and the EH-1 summary to me on major problem areas. Please prepare a final corrective action plan addressing the findings, concerns, and root causes in the report. The plan shall be forwarded to me after receiving the concurrence of the Assistant Secretary for Environment, Safety and Health by no later than twelve weeks from submission of the draft action plan to EH-1, whereupon I will authorize you to implement the response actions.

The final corrective action plan will include a strategy for meeting with the regulators to review and address areas of noncompliance. The final corrective action plan shall also include the planned or current corrective action proposed or underway, the schedule for implementation and completion of each corrective action, and resource budgetary requirements. You should highlight those corrective actions that are not currently accounted for in the Five-Year Plan. If you are unable to determine an appropriate response action for a particular finding or concern, clearly indicate the reasons.

Attachment

cc: Paul L. Ziemer, EH-1
Leo P. Duffy, EM-1
Captain K. Meeks, FE-60
Ray Williams, FE-66
This report documents the Tiger Team Assessment of the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW). NPOSR-CUW consists of Naval Petroleum Reserve Number 3 (NPR-3) located near Casper, Wyoming; Naval Oil Shale Reserve Number 1 (NOSR-1) and Naval Oil Shale Reserve Number 3 (NOSR-3) located near Rifle, Colorado; and Naval Oil Shale Reserve Number 2 (NOSR-2) located near Vernal, Utah, which was not examined as part of this assessment.

The U.S. Department of Energy's (DOE's) Office of Fossil Energy (FE) is the program organization responsible for NPOSR-CUW, and the responsible Field Office is the DOE/NPOSR-CUW Office. John Brown Engineers & Constructors Inc. (JBEI) is the operating contractor at NPOSR-CUW. The Tiger Team Assessment was conducted from June 15 to July 20, 1992, under the auspices of DOE's Office of Special Projects (OSP) under the Assistant Secretary for Environment, Safety and Health (EH-1).

The assessment was comprehensive, encompassing environment, safety, and health (ES&H) and quality assurance (QA) disciplines; site remediation; facilities management; and waste management operations. Compliance with applicable Federal, state, and local regulations; applicable DOE Orders; best management practices; and internal NPOSR-CUW requirements was assessed. In addition, an evaluation of the adequacy and effectiveness of FE, DOE/NPOSR-CUW, and JBEI management of the ES&H/QA programs was conducted.

The content of this report has been reviewed for factual accuracy by DOE Headquarters program secretarial officers including ones from FE, the Office of Environment, Safety and Health, and the Office of General Counsel; DOE/NPOSR-CUW; and JBEI management and personnel. The report has also been reviewed by Federal, state, and local regulators.

The NPOSR-CUW Tiger Team Assessment is part of a larger, comprehensive DOE Tiger Team Independent Assessment Program planned for DOE facilities. The assessment program is part of a 10-point initiative announced by the Secretary of Energy, Admiral James D. Watkins, USN (Ret.), on June 27, 1989, to conduct independent compliance oversight and management assessments of ES&H/QA programs and waste management operations at DOE facilities. The objective of the initiative is to provide the Secretary with information on the compliance status of DOE facilities with regard to ES&H requirements, root causes for noncompliance, adequacy of DOE and contractor ES&H management programs, response actions to address the identified problem areas, and DOE-wide ES&H compliance trends and root causes.

July 1992
Washington, DC
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**GLOSSARY OF ACRONYMS AND ABBREVIATIONS**
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<td>Award Fee Determination Plan</td>
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<td>AOP</td>
<td>Annual Operating Plan</td>
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<td>API</td>
<td>American Petroleum Institute</td>
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<td>ASME</td>
<td>American Society of Mechanical Engineers</td>
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<td>BLM</td>
<td>Bureau of Land Management</td>
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<td>BMPF</td>
<td>Best Management Practice Finding</td>
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<td>BSSW</td>
<td>Basic Sludge and Water</td>
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<td>CATTSS</td>
<td>Corrective Action Tracking and Trending System</td>
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<td>COLE</td>
<td>Colorado Department of Labor and Employment</td>
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<td>CEQ</td>
<td>Council on Environmental Quality</td>
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<td>CERCLA</td>
<td>Comprehensive Environmental Response, Compensation, and Liability Act</td>
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<td>CF</td>
<td>Compliance Finding</td>
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<td>CFR</td>
<td>Code of Federal Regulations</td>
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<td>Corrective Maintenance</td>
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<td>Contracting Officer's Technical Representative</td>
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<td>CPAF</td>
<td>Cost Plus Award Fee</td>
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<td>Cardiovascular Pulmonary Resuscitation</td>
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<td>Decibel</td>
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<td>DMR</td>
<td>Discharge Monitoring Report</td>
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<td>DOC</td>
<td>U.S. Department of Commerce</td>
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<td>DOE</td>
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<td>EA</td>
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<td>EAL</td>
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<td>Employee Assistance Program</td>
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<td>DOE Office of Environment, Safety and Health</td>
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<td>EIS</td>
<td>Environmental Impact Statement</td>
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<td>EM</td>
<td>DOE Office of Environmental Restoration and Waste Management</td>
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<td>EMA</td>
<td>Emergency Management Agency</td>
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<td>EMT</td>
<td>Emergency Medical Technician</td>
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<td>Emergency Operations Center</td>
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<td>U.S. Environmental Protection Agency</td>
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<td>EPAP</td>
<td>Emergency Plan Administrative Procedure</td>
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<td>Emergency Planning and Community Right-to-Know Act</td>
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<td>EPIP</td>
<td>Emergency Plan Implementing Procedure</td>
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<td>ERT</td>
<td>Emergency Response Team</td>
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<td>ES&amp;H</td>
<td>Environment, Safety, and Health</td>
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<td>ESD</td>
<td>Emergency Shutdown</td>
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<td>FAA</td>
<td>Federal Aviation Administration</td>
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<td>DOE Office of Fossil Energy</td>
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<td>FTE</td>
<td>Full-Time Equivalent</td>
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<td>Groundwater Protection Management Program Plan</td>
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<td>GM</td>
<td>Groundwater</td>
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<td>HAZMAT</td>
<td>Hazardous Material</td>
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<td>HEPA</td>
<td>High-Efficiency Particulate Absorber</td>
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<td>IDLH</td>
<td>Immediately Dangerous to Life or Health</td>
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<td>Inactive Waste Sites</td>
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<td>JBEI</td>
<td>John Brown Engineers and Constructors Inc.</td>
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<td>LACT</td>
<td>Lease Automatic Custody Transfer</td>
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<td>Low Temperature Separation (Gas Plant)</td>
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<td>M&amp;D</td>
<td>Management and Operating (Contractor)</td>
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<td>MER</td>
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<td>NPDES</td>
<td>National Pollutant Discharge Elimination System</td>
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<td>Naval Petroleum and Oil Shale Reserves (also FE-60)</td>
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<td>U.S. Nuclear Regulatory Commission</td>
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<td>OP</td>
<td>Operation Procedure</td>
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<td>Occurrence Reporting and Processing System</td>
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<td>U.S. Occupational Safety and Health Act/Administration Office of Solid Waste and Emergency Response</td>
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<td>P&amp;O</td>
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<td>Polychlorinated Biphenyl</td>
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<td>PM</td>
<td>Preventive Maintenance</td>
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<td>POC</td>
<td>Performance Objective and Criterion</td>
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<tr>
<td>PPAPP</td>
<td>Pollution Prevention Awareness Program Plan</td>
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<td>PPE</td>
<td>Personal Protective Equipment</td>
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<tr>
<td>ppm</td>
<td>Parts Per Million</td>
</tr>
<tr>
<td>PSD</td>
<td>Prevention of Significant Deterioration</td>
</tr>
<tr>
<td>psi</td>
<td>Pounds Per Square Inch</td>
</tr>
<tr>
<td>psig</td>
<td>Pounds Per Square Inch Gauge</td>
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EXECUTIVE SUMMARY

This report presents the results of the U.S. Department of Energy (DOE) Tiger Team Assessment of the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOS-CUW). The Tiger Team Assessments are intended to provide the Department with information on the compliance status of the facilities with regard to ES&H requirements, adequacy of the contractor and DOE management of ES&H programs, the root causes of any problems, and actions needed to address identified problem areas.

The NPOS-CUW consists of three major sites. The Naval Petroleum Reserve Number 3 (NPR-3) is located about 35 miles north of Casper, Wyoming. The NPR-3 is a Federally-owned oil field consisting of 9,481 acres currently operated for the production and sale of oil and associated gas liquids. The second site consists of the 40,760-acre Naval Oil Shale Reserve Number 1 (NOSR-1) and the contiguous 14,120-acre Naval Oil Shale Reserve Number 3 (NOSR-3), which are located five miles northwest of Rifle, Colorado. Experimental oil shale mining and retorting was conducted on NOSR-1 and NOSR-3 from the 1920s through the early 1980s. There are natural gas resources on the NOSR-1 and NOSR-3, and gas is produced from 17 wells to protect against the loss of the gas resource from drainage by adjacent privately-owned wells. The third site is the Naval Oil Shale Reserve Number 2 (NOSR-2), a 90,000 acre-site located in Utah about 50 miles southwest of Vernal, Utah. There is currently no activity at NOSR-2.

Management of the sites is under the direction of the DOE Assistant Secretary for Fossil Energy (FE-1). Local oversight and direction is provided by a DOE office located in Casper, Wyoming. John Brown Engineers and Constructors Inc. (JBEC) operates the facilities under contract to the DOE. The main office of the operating contractor is also located in Casper, Wyoming. The operating contract with JBEC will expire on September 30, 1992, and a new contractor, Fluor Daniel Services, Inc., has been selected to replace the existing contractor.

The Tiger Team, which was comprised of about 35 professionals from DOE, contractors, and consultants, conducted the assessment from June 15, 1992 through July 20, 1992. Teams visited NPR-3, NOSR-1, and NOSR-3 and reviewed the programs and practices of both DOE and the operating contractor.

Summary of Results

The primary results of the assessment of the NPOS-CUW environmental, safety, and health programs can be summarized as follows:

- The DOE does not provide adequate direction and oversight of the operating contractor's programs;
- There is a lack of formal ES&H program plans, and, therefore, consistent and complete implementation of programs is lacking;
- There is insufficient ES&H expertise and training at both the operating contractor and DOE;
- Support functions do not provide sufficient assistance to the operations and maintenance organizations;
- Waste management practices and environmental monitoring do not comply with all DOE and regulatory requirements; and
- Certain facilities and equipment are not operated in a safe and reliable manner.

Root Cause

The consolidation of the concerns, findings, and causal factors results in a single integrated root cause:

"The continuing emphasis on program mission orientation has inhibited DOE and the operating contractor from establishing a fully effective environmental, safety, and health program and from achieving DOE's overall goal of ES&H excellence."

This root cause is allowed to exist largely due to the organizational belief by FE and NPOS that their operations are "unique" within DOE, and a perception that DOE direction and ES&H initiatives form "legalistic" requirements that often do not apply to operations at NPOS-CUW. In addition, the NPOS-CUW operation is perceived as profit and production-based with their ES&H program relating more closely to that which would be found in the commercial sector rather than to the DOE emphasis of a commitment to excellence characterized by the vigorous pursuit of formality and discipline, and sufficient funding, staffing, and training.

Environment

There were 62 findings identified in the environmental area, none of which presents either an immediate risk to public health or to the environment, or which warrants an immediate cessation of operations. Taken together, however, they represent a seriously deficient environmental protection program at the NPOS-CUW. Fifty-nine of these findings reflect noncompliance with requirements of Federal, state, or local laws and regulations; DOE Orders or directives; or the operating contractor directives and procedures. This is a significantly higher percentage than normally found at DOE facilities. The key findings are as follows:

- NPOS-CUW lacks a formalized environmental management program with policies, plans, procedures, and training sufficient to ensure compliance with all environmental laws, regulations, and DOE Orders;
- Environmental quality assurance programs have not been implemented by NPOS-CUW;
- Many of the environmental monitoring and protection programs at NPOS-CUW have fundamental deficiencies; and
NPOSR-CUII has not developed a waste management program that defines roles and responsibilities, procedures, and training and qualifications.

Safety and Health

There is a heightened awareness of safety throughout the NPOSR-CUII site, and much improvement in the safety and health program is evident over the last 6 to 12 months. However, the operating contractor has still not fully communicated its expectations for safety improvement and has not provided sufficient leadership, resources, and training to assist the employees in achieving an excellent safety program. The operating contractor and DOE management have not developed the necessary tools, such as safety and health (S&H) plans, goals, performance standards, and a quality assurance program.

DOE Orders and requirements have not been effectively transmitted to the operating contractor. DOE has not provided sufficient oversight of the operating contractor’s safety and health programs and associated activities. These deficiencies have resulted in the failure to develop an S&H program appropriate for the site’s risks.

There were 110 concerns identified in the safety and health program. There were no concerns which identified hazards that required immediate shutdown of any facilities or operations. There were, however, 11 concerns that represent a significant risk to people or property or substantial noncompliance with DOE Orders and which will require immediate attention.

The four key concerns developed are the following:

- The DOE Site Office has not provided the guidance, support, and oversight to the operating contractor necessary for the implementation of effective safety and health related programs;
- The operating contractor’s management has not organized and coordinated its operational and technical support functions for the development and implementation of safety and health plans, programs, and requirements;
- The operating contractor has not properly identified, evaluated, controlled and corrected many safety and health hazards in the work place; and
- The operating contractor does not ensure that operations, maintenance, and technical staff have the necessary safety, health, and qualification training required by DOE Orders.

Management

The primary mission of the NPOSR-CUII has been to produce oil from the NPR-3 in accordance with legislation enacted in 1916, which directed production at the maximum efficient rate. Economic production is still the primary driving force in operation of the site today. The DOE and its operating contractor recognize the importance of enhanced safety and environmental programs and are making a sincere effort to improve their S&H programs. However, S&H programs are still not perceived as a no more than equal in status with production and profitability. There are a number of deficiencies in the management approach of both the DOE and the operating contractor. These are reflected in the following key findings:

- DOE (FE/NPOSR/NPOSR-CUII) and the operating contractor have not developed an effective, self-initiated, strategic or operational planning process to ensure that proposed courses of action to implement a comprehensive S&H program can realistically be accomplished and integrated with operating objectives;
- DOE (FE/NPOSR/NPOSR-CUII) and the operating contractor have not implemented an effective environment, safety, and health training program; and
- DOE (FE/NPOSR/NPOSR-CUII) and the operating contractor S&H oversight activities have been inadequate to ensure the development and effective implementation of good S&H programs.

Self-Assessment Program

FE has made significant progress in their self-assessment program. This includes development of a self-assessment approach that flows through the entire line organization, from FE-1 to the operating contractor. Although FE has taken an aggressive approach to their self-assessment program, program elements have not been developed and instituted in a timely fashion. Field organizations and the operating contractor have not received timely guidance and direction for the development and conduct of self-assessment activities. Self-assessments that have been done by the site do not yet provide a sufficient level of detail. While progress has been made, much remains to be done to ensure that an institutionalized, comprehensive self-assessment program is fully implemented throughout the FE organization.
INTRODUCTION

On June 27, 1989, Secretary of Energy, Admiral James D. Watkins, USN (Retired), announced a 10-point initiative to strengthen environment, safety, and health (ES&H) programs and waste management operations in the U.S. Department of Energy (DOE). One of the initiatives involved conducting independent Tiger Team Assessments at DOE operating facilities. The DOE Office of Special Projects (OSP) in the DOE Office of Environment, Safety and Health (ES&H) has the responsibility to conduct Tiger Team Assessments for the Secretary of Energy. This report presents the assessment of the buildings, facilities, and activities at the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW). NPOSR-CUW consists of Naval Petroleum Reserve Number 3 (NPR-3) near Casper, Wyoming; Naval Oil Shale Reserve Number 1 (NOSR-1) and Naval Oil Shale Reserve Number 3 (NOSR-3) near Rifle, Colorado; and Naval Oil Shale Reserve Number 2 (NOSR-2) near Vernal, Utah. NPR-3, NOSR-1, and NOSR-3 were examined as part of the assessment. As there has never been any significant activity at NOSR-2, it was not examined as part of the assessment. NPOSR-CUW is the thirty-fifth DOE site to be reviewed by a Tiger Team. NPOSR-CUW are large oil, gas, and oil shale reserves which have been used as an instrument of strategic insurance, national security policy, and sources of revenue. DOE’s Office of Fossil Energy (FE) is the program organization responsible for NPOSR-CUW, and the responsible Field Office is the DOE/NPOSR-CUW office. John Brown Engineers & Constructors Inc. (JBEC) is the operating Contractors for NPOSR-CUW.

PURPOSE

The purpose of the NPOSR-CUW Tiger Team Assessment is to provide the Secretary of Energy with concise information on the following:

- current ES&H compliance status at the site and the vulnerabilities associated with that compliance status,
- root causes for noncompliance,
- adequacy of DOE/NPOSR-CUW and JBEC ES&H management programs, and
- adequacy of response actions needed to address identified problem areas.

This information will assist DOE in determining patterns and trends in ES&H compliance and probable root causes, and will provide guidance for management to take needed corrective actions.
1.2 SCOPE
The scope of the NPOSR-CUW Tiger Team Assessment is comprehensive and includes an evaluation of applicable site management systems, facilities, and operations in the context of ES&H. The ES&H areas reviewed included, but were not limited to the following:

- compliance with applicable Federal, state, and local regulations, requirements, permits, agreements, and enforcement actions;
- compliance with DOE ES&H Orders;
- compliance with the Occupational Safety and Health Administration (OSHA) regulations and standards;
- adequacy of DOE/NPOSR-CUW and JBEC ES&H management programs, including policy and procedures, internal oversight, planning and budgeting, organization, resources, training, and quality assurance;
- conformance with applicable "best" or "accepted industry practices";
- identification of root causes;
- identification of noteworthy practices; and
- adequacy of the self-assessment process to identify, track, and resolve significant ES&H issues.

1.3 APPROACH
The Tiger Team Assessment at NPOSR-CUW was conducted in accordance with the Tiger Team Guidance Manual (February 1990), the "Performance Objectives and Criteria for Technical Safety Appraisals at DOE Facilities and Sites" (June 1990), and generally accepted techniques. A team of specialists from various DOE offices and support contractors conducted the assessment. The Tiger Team was managed by a senior DOE official, and three experienced Subteam Leaders, one for each of the three disciplines of Environment, Safety and Health, and Management. Team members, with their areas of responsibility and work-related experience, are identified in Appendix A.

The Tiger Team Assessment reviewed all major production and support facilities and operations at NPR-3, NOSR-1, and NOSR-3. Major Production Facilities and operations examined include, but were not limited to, the Low Temperature Separation (LTS) Gas Plant, Steam Generator Units, and drilling operations. The principal support facilities include product transfer and transport systems, road systems, fresh water and wastewater treatment and disposal systems, sewage systems, and fire water systems.

The Environmental Subteam performed its assessment consistent with the Environmental Audit Manual (January 1990). This document was used as a tool in preparing for the assessment and was supplemented with current regulations, regulatory guidance documents, and references applicable to identifying best management practices. The objective was to assess the site's current environmental compliance status with regard to Federal, state, and local regulations; DOE Orders; agreements; permits, and applicable permits. The environmental assessment examined site performance against best or accepted industry practices, and evaluated the adequacy of DOE and contractor environmental program management and resources.

The Safety and Health Subteam, which conducted a separate Technical Safety Appraisal (TSA) under the leadership of an experienced Subteam Leader, reviewed all major facilities at NPR-3, NOSR-1, and NOSR-3 using TSA protocols, as delineated in DOE 5482.1B, "Environment, Safety, and Health Appraisal Program", and the "Performance Objectives and Criteria for Technical Safety Appraisals at DOE Facility and Sites" (June 1990). Performance objectives used for the appraisal making up the safety and health assessment are derived from DOE Orders, Secretary of Energy Notices (SENs), other policy statements, and industry standards.

The objectives of the Management Subteam were to determine the effectiveness of DOE/NPOSR-CUW, and JBEC ES&H program management and to identify underlying probable root causes for observed weaknesses or deficiencies. The Management Subteam conducted its assessment in accordance with the draft "Management Performance Objectives and Criteria for Tiger Team Management Assessments" (August 15, 1991). The Management Subteam coordinated with the Environment and Safety and Health Subteams to share information and ideas on management issues identified during the course of the Tiger Team Assessment, as well as to identify management issues that were common to the findings of all of the subteams.

A Self-Assessment Task Group under the leadership of a member of the Management Subteam evaluated DOE/NPOSR-CUW, and JBEC self-assessment activities, compared results of self-assessments with the Tiger Team's findings, and reviewed the cognizant DOE, DOE/NPOSR-CUW, and JBEC self-assessment programs. The Task Group conducted its evaluation in accordance with SEN-60-91 and the Secretary's memorandum and attachments subject: "Guidance on Environment, Safety and Health (ES&H) Self-Assessment" (July 31, 1990).

As part of the Tiger Team Assessment at NPR-3, a review of the working level employees (i.e., hourly employees actually performing the operations, maintenance, well servicing, etc.) perceptions of that facility's health and safety program was conducted. This review was deemed necessary because these working level employees are not represented by a union or an employee organization. The review, entitled "Working Level Employee Perceptions of NPR-3 Health and Safety Program," can be found in Appendix I.

A systematic approach was implemented to analyze probable root causes. This approach began with the analysis and evaluation of detailed background information and assessment data by the individual subteams to develop their findings and concerns. These individual findings were integrated by the subteams through identification of probable causal factors. The last step in the process was a collective determination of a set of probable root causes, based on the identified causal factors, for the findings and concerns identified.
The Tiger Team Assessment process includes four distinct phases: pre-assessment and planning, onsite activities, reporting, and corrective action planning.

1.3.1 Preassessment Planning

Planning for the assessment included the issuance of an introduction and information request memorandum, a preassessment site visit, an initial review of the requested documentation provided to the Tiger Team by DOE/NPOSR-CUW, and development of an assessment agenda.

The preassessment site visit was conducted by the Tiger Team Leader; the Environmental, Safety and Health, and Management Subteam Leaders; and representatives from EH, OSP, and FE on April 28 through 30, 1992. The senior managers involved with NPOSR-CUW activities provided overviews of site operations and ES&H programs. The Tiger Team Leader and Subteam Leaders discussed the Tiger Team Assessment program and necessary support requirements for the onsite assessment. Federal and state regulators attended the preassessment activity.

1.3.2 Onsite Activities

Onsite activities for the assessment took place from June 15 through July 20, 1992. These activities included field observations; document reviews; observation of routine operations, emergency exercises, and the physical condition of the site and facilities; reviews of previous audits and assessments; and interviews with FE, DOE/NPOSR-CUW, and JBEC personnel, as well as personnel from Federal, state, and local regulatory agencies.

Using these sources of information, the Tiger Team developed issues that are reported as either findings (Environmental Assessment, Management Assessment, and Self-Assessment), or concerns (Safety and Health Assessment). Section 1.3.3 discusses this development process in more detail.

The Tiger Team process was conducted in an open manner for FE, DOE/NPOSR-CUW, and JBEC staff and management, and regulators in order to enhance communication with these groups and to ensure the accuracy of information and issues. During the process, all three subteams conducted daily debriefing sessions. In addition, the Tiger Team Leader held frequent meetings with senior DOE/NPOSR-CUW and JBEC managers to provide a summary overview of the Tiger Team's progress and to discuss major issues identified by the subteams. Prior to the closeout briefing, each subteam provided copies of draft findings and concerns to FE, DOE/NPOSR-CUW, and JBEC personnel and conducted factual accuracy reviews.

1.3.3 Reporting

The balance of this Tiger Team Assessment report contains five sections. Section 2.0 is an overall summary of the key Tiger Team Assessment findings, concerns, noteworthy practices, and probable root causes identified by all three subteams. Sections 3.0 through 5.0 contain the Environmental, Safety and Health, and Management Subteam findings and concerns, respectively. Section 6.0 addresses an evaluation of the FE, NPOSR-CUW, and JBEC self-assessment programs and reports.

For the Environmental Subteam, identified issues are categorized as either compliance findings (CFs), best management practice findings (BMPFs), or noteworthy practices. Compliance findings are conditions that, in the judgment of the subteam, may not satisfy applicable ES&H regulations. DOE Orders (including internal DOE memoranda where referenced and draft DOE Orders), internal ES&H site operating standards, enforcement actions, agreements with regulatory agencies, or permit conditions. Best management practice findings are derived from regulatory agency guidance, draft DOE Orders, accepted industry practices, and professional judgment. Noteworthy practices are actions or practices which are viewed as exceptional or commendable in meeting ES&H objectives. Other facilities are encouraged to adopt these practices when they apply to their operations.

A statement of an applicable performance objective prefaced each finding. Performance objectives for compliance findings are derived from promulgated regulations and final DOE Orders, consent orders, agreements, and permit conditions. Performance objectives for best management practice findings are derived from regulatory agency guidance, accepted industry practices, and professional judgment. Findings for the Environmental Subteam are not necessarily arranged in order of relative significance.

The Safety and Health Subteam employed a reporting format consistent with the TSA process. Each identified issue was developed into a concern, which is supported by findings, and has the characteristics of being explicit (stating the problem), measurable (auditable), and justifiable. A concern addresses a situation that, in the judgment of the subteam, meets one or more of the following criteria:

- reflecta less than full compliance with a DOE safety and health requirement or mandatory safety standard;
- threatens to compromise safe operations; and
- if properly addressed, would substantially enhance the excellence of that particular situation even though that part of the operation was judged to have a currently acceptable margin of safety.

Because of this last category addressing the excellence of the operation, more concerns are reported than would result from a strictly compliance-oriented assessment. Each concern is categorized by its seriousness, potential hazard consideration, and compliance consideration. Findings and concerns are prefaced by a statement of the performance objective in each discipline area.

The Management Subteam evaluated the effectiveness of management processes relative to ES&H programs to identify findings and further insights into probable root cause for ESP findings and concerns developed by the other subteams. The Management Subteam's findings were derived from analyses of key management areas that impact on ES&H activities, and considered DOE policy and Orders, generally accepted management principles, and industry standards. Each finding is supported by a summary and discussion which identifies further detail as to the background, factual basis, and, where appropriate, the management implications of the finding.
The Self-Assessment Task Group evaluated the effectiveness of the cognizant self-assessment activities and programs to identify problems, weaknesses, and vulnerabilities. The Task Group's findings resulted from evaluations based on the 11 elements, performance objectives and criteria in the Secretary's July 1990 memorandum, as well as a comparison of FE, DOE/NPOSR-CUM, and JBEC self-assessment findings to those of the Tiger Team. Each finding is supported by a discussion which provides detail and, where appropriate, any management implications of the finding.

The Tiger Team Assessment reflects conditions at a fixed point in time. Improvements in the ESH areas that were planned, but were not completed at the time of this assessment, are identified in the report to provide a complete and accurate picture of the condition of NPOSR-CUM from the onset of the assessment.

This Tiger Team report was transmitted to DOE Headquarters program secretarial officers, including ones from FE, the Office of Energy Research (ER), EH, and the Office of General Counsel; Federal, state, and local regulators; and DOE/NPOSR-CUM and JBEC management and personnel for technical and factual accuracy review.

1.3.4 Corrective Action Planning

The Assistant Secretary for Fossil Energy will be responsible for the preparation of a draft action plan that addresses the findings and concerns and probable root causes identified by the Tiger Team Assessment.

DOE/NPOSR-CUM, JBEC and Fluor Daniels Service, Inc. staff will participate in the action plan development. The Assistant Secretary for Environment, Safety and Health (EH-1) will review and comment on the draft plan. Following revisions to the draft action plan, the Secretary, through concurrence of EH-1, will approve the final action plan and will direct the Assistant Secretary for Fossil Energy to implement.

1.4 SITE DESCRIPTION

NPOSR-CUM consists of NPR-3, located near Casper, Wyoming; NOSR-1 and NOSR-3, located near Rifle, Colorado; and NOSR-2, located near Vernal, Utah.

NPR-3 covers 9,481 acres and is approximately 7 miles long by 3 miles wide. Ten oil zones have produced oil and gas at NPR-3 of which eight oil zones are still producing. The most significant production has occurred in the Second Wall Creek and Shannon formations. The Second Wall Creek is nearly depleted. The Shannon Steam Drive Project will be the primary source of production in the future.

NPR-3 has a site population of approximately 140 NPOSR-CUM personnel. About 50 DOE (less 14 DOE personnel) are based in Casper, and the remainder of the JBEC personnel are located at the site. The number of subcontractor personnel varies from 0 to 40 as they are needed. The nearest communities are Midwest and Edgerton, which are located about 5 miles north of the oil field, and Casper which is 35 miles southwest.

The land surface at NPR-3 is covered mainly by a very thin soil derived from weathered shale containing thin beds of bentonite. Alluvial deposits are present in the Teapot Creek and Little Teapot Creek drainages. These deposits may be up to 40 feet thick. These alluvial deposits also contain shallow groundwater that is intimately connected with the surface water system. Sulfate and chloride salts are abundant in the shale, residues derived from shale, alluvial deposits, and surface water. These salts cause surface waters to be naturally high in total dissolved solids and are unfit for human consumption.

The regional climate is generally semiarid to arid. Temperature extremes range from 100°F in July and August to -40°F in December and January.

No endangered species of plants or animals have been identified on NPR-3. The Wyoming Game and Fish Department has reported sighting Bald Eagles.

NOSR-1 and NOSR-3 are adjacent oil shale reserves of 40,760 and 14,130 acres in size, respectively, located in northwestern Colorado near the towns of Rifle and Parachute. NOSR-1 contains an oil shale resource estimated at 3.8 billion barrels of recoverable oil shale and is part of the oil shale rich Piceance Basin of Colorado, Wyoming, and Utah. NOSR-3 contains very little oil shale, since most of it lies below the outcrop. NOSR-1 and NOSR-3 contain natural gas resources in the Wasatch and Messasverde formations. Only one JBEC employee is assigned full-time to the NOSR-1 and NOSR-3 sites.

NOSR-1 and NOSR-3 lie within the Upper Colorado River drainage basin. They are drained by the eastern tributaries of Government Creek on the eastern side, and several streams and washes along their southern boundary all of which drain into the Colorado River. Surface water at NOSR-1 is of high quality. The groundwater system of NOSR-1 for the first 2,000 feet in depth contains very high quality water.

The climate is semiarid with temperatures ranging from -38°F to 101°F.

Surveys have found no listed endangered or candidate threatened or endangered species at NOSR-1 and NOSR-3, with the exception of the candidate species Colorado cutthroat trout and the Peregrine falcon.

Figure 1-1 depicts the location of NPR-3, NOSR-1, and NOSR-3 within the Wyoming, Colorado, Utah region. Figures 1-2 and 1-3 provide a more detailed display of NPR-3, NOSR-1, and NOSR-3 respectively.

NOSR-2 is an oil shale reserve of about 90,000 acres, located in northeastern Utah in Carbon and Uintah Counties, about 50 miles southwest of Vernal, Utah. NOSR-2 lies within the Hill Creek Extension of the Uintah-Ouray Indian Reservation. The size of the non-Indian portion of NOSR-2 is about 46,000 acres. No residences exist at NOSR-2, and no DOE facilities have been constructed. The only activities are commercial livestock grazing by the Ute Indian Tribe and by ranchers who lease grazing rights through the Bureau of Land Management (BLM). The Desolation Canyon of the Green River cuts across the northwestern corner of NOSR-2. It is used as a recreation area by private and commercial rafters.
NOSR-2 is situated in rugged dissected table land, characterized by flat-topped mesas and steep-walled canyons. Elevation ranges from 4,600 feet above sea level at the bottom of Desolation Canyon at the west boundary of NOSR-2 to 7,050 feet above sea level near the south boundary of NOSR-2.
1.5 OVERVIEW OF NPOS R ACTIVITIES

As the missions of NPR-3, NOSR-1, and NOSR-3 are different, they will be profiled separately.

NPR-3 was established by Executive Order in 1915, and was created by the U.S. Department of the Navy as an emergency source of liquid fuels. The reserves were transferred to the Department of the Interior in 1922, back to the Navy Department in 1928, and, subsequently, to DOE in 1977. In 1976, the U.S. Congress enacted Public Law 94-258, which allowed production for 6 years at the Maximum Efficiency Rate (MER). The President has extended production four times for 3-year periods; the current authorization has been extended until 1994.

The mission of NPR-3 is to produce oil and gas at the MER. This requires that drilling and production be done economically and that the oil field remain profitable.

Major production facilities on NPR-3 are the LTS Gas Plant, the four steam generators for the Shannon Steam Drive Project, the Water Treatment Facility, Water Disposal Facility, and the tank batteries and test satellites. The principal support facilities include road systems, freshwater and wastewater systems, sewage systems, landfill, and electrical power distribution system.

Prior to 1976, 235 wells had been drilled at NPR-3. Since 1976, an additional 877 wells have been drilled, 18 wells in 1991. In addition, Steam Generators 3 and 4 were installed in 1991, and injection into two well patterns was initiated. The Water Treatment Facility expansion was also completed in 1991 to supply softened water to generators, and Generator 5 was purchased with delivery and installation scheduled for 1992.

NOSR-1 and NOSR-3 were established in 1916 and 1924, respectively, by Executive Order, as a future source of field supplies for the U.S. Navy.

The mission of NOSR-1 and NOSR-3 is to prospect and explore for oil shale reserves while ensuring protection of the environment. Protection of the surface environment is effected through a Memorandum of Understanding with the Bureau of Land Management. DOE has drilled 17 natural gas wells to protect NOSR-3 from the loss of gas resources through drainage. The wells are operated by JBEC.

During 1991, DOE produced 1.7 billion cubic feet of natural gas from its ten 100-percent wells a NOSR-3, and 4.0 billion cubic feet of natural gas was produced from the 17 comminized wells in which DOE owns an interest.

JBEC is the management and operation contractor for NPR-3, NOSR-1, and NOSR-3 (as well as NOSR-2). (JBEC purchased Lawrence-Allison and Associates West, Inc., the previous contractor, and the contract was novated to JBEC in March 1989.) The term of the current JBEC contract is from October 1, 1986 to September 30, 1991; however, a 6-month extension with 2 additional 3-month extensions have been granted. As a result of a recent procurement decision, Fluor-Daniels Services, Inc. will become the management and operating contractor effective October 1, 1992.

2.0 KEY FINDINGS, ROOT CAUSES, AND NOTEWORTHY PRACTICES
2.0 KEY FINDINGS, ROOT CAUSES, AND NOTEWORTHY PRACTICES

2.1 ENVIRONMENTAL

The Environmental Subteam identified 62 findings as part of the Tiger Team Assessment. While none of the findings present an immediate risk to public health or the environment or warrant an immediate cessation of operations, taken together they represent a serious deficiency in the environmental protection program at the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW). Fifty-nine findings reflect situations that result from not meeting the requirements of Federal, state, or local laws and regulations; U.S. Department of Energy (DOE) Orders; and Naval Petroleum and Oil Shale Reserves (FE-60) or onsite contractors' directives or procedures. These findings reflect conditions where best management practices are not employed.

No noteworthy practices were identified as part of this assessment. A noteworthy practice is defined as a practice that, in the judgment of the assessment team, will have general application at other DOE facilities/operations. However, the lack of noteworthy practices is not an indication of a deficiency.

From these 62 findings, the Environmental Subteam identified the following 4 key findings. Each key finding is supported by a group of findings presented in Section 3.5 and represents an important program concern.

2.1.1 Key Findings

- Formality of Environmental Programs, Policies, Procedures, and Training. NPOSR-CUW lacks a formalized environmental management program with policies, plans, procedures, and training sufficient to ensure compliance with all environmental laws, regulations, and DOE Orders. Many of the environmental protection documents required by DOE 5400.1 either do not exist, or are not of sufficient quality or scope. These include the Waste Minimization Plan, the Pollution Prevention Awareness Plan, the Environmental Monitoring Plan, and the Groundwater Protection Management Plan. The implementation of the plans that have been written is deficient in many areas. Most of the environmental protection activities are done without formal procedures and training of personnel. This concern is prevalent across all of the environmental protection disciplines. Additionally, documentation related to environmental protection and compliance was found to be chronically deficient at NPOSR-CUW. The lack of formality of NPOSR-CUW's environmental activities is partially the result of the personnel assigned to implement and oversee the environmental protection programs; they are not of sufficient number and do not have adequate experience and training. The lack of formality in environmental programs has contributed to the slow progress since 1990 to resolve environmental protection issues. The 1988 DOE Environmental Survey and assessments conducted by subcontractors in 1990 and 1991 identified many findings, concerns, and issues that could have been addressed before the Tiger Team Assessment. There has been a failure to properly communicate DOE policies and requirements throughout NPOSR-CUW. Within DOE/NPOSR-CUW, not all DOE Orders have been reviewed for relevance at NPOSR-CUW and for those reviewed, guidance was less than adequate in some cases.

- Quality Assurance and Oversight. Environmental quality assurance (QA) programs have not been completely implemented by NPOSR-CUW. Environmental QA programs and plans have been prepared and submitted by DOE/NPOSR-CUW and John Brown Engineers and Constructors Inc. (JBEC) to the DOE Office of Fossil Energy (FE) for approval. However, the Environmental QA program for this program. Elements of an environmental QA program that have not been implemented include use of formal procedures, personnel training, audits/corrective actions, oversight of the contractor and subcontractors, data validation, and recordkeeping. Within DOE/NPOSR-CUW, the QA Officer does not have sufficient independence, is not allotted sufficient time to perform all of the elements of an environmental quality assurance program, and has limited quality assurance training. Within JBEC, the QA function has improved recently due to the hiring of a key specialist who will address quality issues on a full-time basis. The overall QA function, however, does not adequately address environmental QA. Audits and assessments have not been effectively implemented because of a lack of procedures and training. The lack of environmental QA at NPOSR-CUW is apparently caused by a lack of DOE/NPOSR-CUW and JBEC management recognition of this need.

- NPOSR-CUW lacks a basic overall understanding of QA oversight as a fundamental management tool to ensure that all environmental activities are performed in compliance with environmental laws, regulations, and DOE Orders. QA oversight is also essential to ensure that the data obtained from analytical support services are of known quality and are defensible. DOE/NPOSR-CUW and JBEC have not instituted a formal program of oversight to ensure that plans and actions for QA are established, understood, and implemented.

- Environmental Monitoring and Protection Programs. Many of the environmental monitoring and protection programs at NPOSR-CUW have fundamental deficiencies. Deficiencies have been identified in the groundwater, air, and surface water programs, and the validity of monitoring data for all media is in question because of weaknesses in sampling practices. Groundwater protection management programs and sitewide hydrogeologic monitoring well networks have not been implemented. Inadequate plugging and abandonment practices for inactive and abandoned monitoring wells and cased boreholes present potential pathways for groundwater contamination. A formal air quality management program has not been developed to determine applicable Federal and state requirements and to assess compliance status. Air quality surveillance has not been performed to monitor the effects, if any, of NPOSR-CUW activities on onsite and offsite environmental and natural resources. There is no meteorological monitoring program to provide meteorological information in support of air management and emergency response activities. A complete source control and assessment program to quantify emissions, which is needed for evaluation of prevention of significant deterioration
source status, does not exist. A concern at NOSR-3 is the possible collapse of the shale pile and its potential impact on waters of the United States.

Many of the deficiencies at NPOSR-CUW can be attributed to a lack of qualified personnel, inadequate allocation of personnel resources, and a general lack of understanding of environmental laws, regulations, and DOE Orders. The roles, responsibilities, and authorities have not been clearly defined in DOE/NPOSR-CUW and JBEC, so that effective environmental programs can be implemented. The self-assessment program has not been institutionalized and a corrective action program has not been implemented.

Waste Management. NPOSR-CUW has not developed a waste management program that defines roles and responsibilities, procedures, and training and qualifications. The lack of a program has resulted in considerable deficiencies in the area of waste management. The critical waste management issue identified during the Tiger Team Assessment involved inadequate recordkeeping. NPOSR-CUW could not provide documentation to determine its RCRA generator status, which is necessary to establish applicable hazardous waste management requirements. Another significant issue is waste characterization. NPOSR-CUW does not have procedures to characterize both hazardous and nonhazardous wastes, resulting in several instances of noncompliance with Federal and state requirements. NPOSR-CUW’s management of waste accumulation, treatment, and disposal facilities is deficient as evidenced by a lack of required notifications to regulatory agencies, design inadequacies, and improper operations. These deficiencies can be attributed to a lack of oversight (by both JBEC and DOE/NPOSR-CUW) and a lack of procedures to ensure compliance with DOE, EPA, and state requirements. Interviews with employees responsible for the day-to-day conduct of waste management operations indicated a consistent lack of knowledge with respect to regulatory requirements. These employees have not been provided with training and formal operational guidance that would ensure compliance with regulatory requirements.

2.1.2 Causal Factors

The Environmental Subteam attempted to identify apparent causal factors that contributed to the occurrence of individual findings. Establishing the predominant causal factors assists management in the formulation of probable root causes. DOE/NPOSR-CUW and JBEC are expected to develop and implement corrective actions for individual causal factors identified in each finding, as well as for causal factors known by NPOSR-CUW to have contributed to the finding.

Thirteen causal factors were identified as contributing to the occurrence of the Environmental Subteam findings. In many instances, more than one causal factor is identified for each finding. A summary of individual causal factors identified for each finding is presented in Section 3.0 (see Table 3-2). Each of these causal factors is defined in Appendix G. The four causal factors that appear most frequently are policy implementation, procedures, training, and appraisals/audits/reviews.

A discussion of these four causal factors follows:

- Policy implementation appeared in 65 percent of the findings. Federal, state, and local laws and regulations or DOE Orders were not implemented or fully implemented. This causal factor was evident in all of the environmental disciplines assessed.
- Procedures appeared in 47 percent of the findings. NPOSR-CUW has not developed and implemented procedures to ensure environmental compliance. This causal factor was evident in all environmental disciplines assessed except radiation.
- Training appeared in 37 percent of the findings. NPOSR-CUW does not have an adequate personnel training program to implement DOE Orders and applicable Federal, state, and local laws and regulations. This causal factor was evident in all environmental disciplines assessed except radiation and waste management. However, several deficiencies in waste management training are presented in QA/CF-5.
- Appraisals/audits/reviews, a secondary causal factor, appeared in 35 percent of the findings. NPOSR-CUW has failed to identify inaccuracies and program deficiencies because it has not implemented a formal and comprehensive program of audits, surveillance, and work product review for environmental activities. This causal factor was evident in all environmental disciplines assessed except quality assurance.

2.2 SAFETY AND HEALTH

In the 13 technical areas examined by the Safety and Health Subteam, all applicable performance objectives were evaluated. The Safety and Health Subteam identified a total of 110 concerns in the 13 technical areas. The most significant concerns, based on the level of hazard potential and noncompliance with DOE requirements, are in the areas of Organization and Administration, Maintenance, Worker Safety and Health, Occupational Safety, and Fire Protection. Category II concerns were identified that addressed lack of enforcement of the provisions of the DOE-JBEC operating contract, lack of DOE/NPOSR-CUW direction and oversight of JBEC, the presence of equipment and facility safety hazards, JBEC noncompliance with Occupational Safety and Health Administration (OSHA) standards, JBEC lack of hazard evaluation and control, and JBEC failure to protect facilities against excessive property losses for a maximum credible fire.

2.2.1 Key Concerns

Key concerns were formulated based on the potential impact on the safety of activities conducted at NPOSR-CUW, and are as follows:

- The DOE/NPOSR-CUW Site Office has not provided the guidance, support, and oversight to the operating contractor necessary for the implementation of effective safety and health-related programs. The lack of site office guidance, support, and
oversight has resulted in serious deficiencies or lack of JBEC programs in training, emergency preparedness, packaging and transportation, occupational safety and health, radiation protection, medical services, and quality assurance. The site office has not enforced the safety and health and quality assurance provisions of the DOE operating contract with JBEC. The Site Office has not conducted functional appraisals of JBEC to ensure safety and health coverage, has not conducted safety and health program assessments, has not ensured the development of a Safety Analysis Report, and has not provided surveillance and oversight of the JBEC internal safety review system.

- The operating contractor's management has not organized and coordinated its operational and technical support functions for the development and implementation of safety and health plans, programs, and requirements. JBEC has not prepared safety and health plans as required by DOE Orders and the operating contract to integrate the efforts of key groups. The Packaging and Transportation Program has not been organized or properly coordinated. Responsibility and authority for shipment of hazardous materials has not been established. The JBEC Safety Review Committee does not have a charter specifying responsibility, authority, and reporting requirements. JBEC Operations and Maintenance groups do not effectively interface with Engineering to ensure sound safety principles in the selection, installation, operation, and maintenance of components and equipment. JBEC does not effectively coordinate electrical and mechanical engineering support with operations and maintenance activities. JBEC does not effectively incorporate safety in the engineering design and installation of facilities and equipment. JBEC does not formally require safety and health review of new and revised policy and procedure documents. The JBEC Safety and Health Section does not provide all necessary support and oversight to the line organization.

- The operating contractor has not properly identified, evaluated, controlled, and corrected many safety and health hazards in the workplace. JBEC Operations personnel do not effectively monitor the safe operating condition of equipment. Certain facilities and drilling equipment are not operated and maintained in a safe and reliable manner. The Maintenance organization does not ensure safe and effective conduct and control of maintenance activities. The Maintenance organization has not maintained the condition of components and equipment in a manner to prevent hazardous conditions caused by non-code installations, improper operation, and deterioration. A Safety Analysis Report has not been developed to define the administrative safety control limits for operations. JBEC does not require independent safety and health reviews. JBEC does not ensure comprehensive review of major items important to safe operations, does not perform periodic safety appraisals, and has not conducted triennial safety appraisals of its safety review system. JBEC does not comply with numerous OSHA standards, including Walking and Working Surfaces, Machinery and Machine Guarding, Electrical, Control of Hazardous Energy (Lockout/Tagout), Excavations, and Hazard Communication, among others. JBEC has not identified confined space entry hazards and does not properly control confined space entries. JBEC has not properly identified and controlled the hydrogen sulfide hazard. JBEC does not conduct an effective hazard surveillance and exposure monitoring program. Hazards from handling of chemicals have not been fully evaluated, and basic safety equipment such as eyewash stations have not been properly provided. Job safety analyses have not been conducted for many operations. Hazards of working alone have not been evaluated, and a corresponding work alone policy has not been developed. Electrical safety hazards have not been evaluated, and personal protective equipment has not been specified and provided.

- The operating contractor does not ensure that operations, maintenance, and technical staff have the necessary safety, health, and qualification training required by DOE Orders. JBEC has not implemented a formal training program to ensure that operations, maintenance, and technical staff have required safety, health, and qualification training. Formal on-the-job training has not been developed for field operations and maintenance personnel. JBEC has not ensured that all subcontractors working onsite satisfy safety and health training requirements. Not all JBEC employees have received occupational safety and health training appropriate to job needs. Emergency preparedness training, hazardous materials emergency response training, and personal protective equipment training have not been conducted. There is no training program for personnel involved in hazardous materials packaging and transportation operations. Competent person training, as required by OSHA, has not been provided. Hazard communication training has not been provided as required by the OSHA standard. Confined space training for those authorizing entry is not sufficient to qualify them for this responsibility.

2.2.2 Causal Factors

The Safety and Health Subteam made an effort to identify the causal factors that contributed most directly to each concern. These causal factors have been highlighted for ease of identification and are noted below.

- The DOE/NPOSS-CUW Site Office has not provided direction for the implementation of DOE Orders and requirements at the Naval Petroleum Reserve Number 3 (NPR-3). DOE Orders and requirements have not been formally transmitted to the contractor in a timely manner by DOE/NPOSS-CUW due to the lack of a formal directives system. The site office has not provided sufficient information to assist JBEC in interpreting and implementing DOE Orders. Recent directives from the site office to JBEC requested implementation of Orders that had been in effect for some period of time. Many of these directives lacked sufficient guidance to assist JBEC. The delays in receiving clear guidance and direction have resulted in significant deficiencies in JBEC safety and health-related programs which include quality assurance, emergency preparedness, packaging and transportation, fire protection, and medical services.
The operating contractor management has not developed and communicated a strategy for its safety and health programs at NPR-3. JBEC management has not developed safety and health program plans defining responsibilities, program needs and priorities, and implementation schedules. Management staffing plans have not been prepared to support safety and health program plans and to anticipate and manage impacts resulting from potential funding changes, attrition, and programmatic direction. Contractor management has not established a means to develop and communicate its expectations and standards for safety and health programs. Position descriptions do not provide clear documentation of safety responsibilities. Clearly defined safety performance standards have not been established as part of the performance appraisal process to provide accountability and communicate direction to employees. Annual safety and health goals have neither been established by JBEC management nor has a process been developed to communicate such goals and direction to all levels of the organization. JBEC has not properly developed and applied the necessary management systems and tools to bring the NPR-3 safety and health program into a single coherent strategy. The lack of such a strategy has resulted in numerous program deficiencies in the areas of planning, emergency preparedness, packaging and transportation, fire protection, medical services, quality assurance, and certain elements of occupational safety and health.

2.3 MANAGEMENT AND ORGANIZATION

2.3.1 Key Findings

Historically, the primary mission of DOE/NPOSR-CWIN has been to produce oil from NPR-3 in accordance with Public Law (P.L.) 94-258 enacted in 1976, which directed the Secretary of the Navy to produce NPR-3 at the maximum efficient rate. This instruction has been further interpreted to mean that the reserves must be profitable and gross revenues must exceed gross outlays of appropriated funds. It is for these reasons that production and profitability have been the driving forces that have strongly influenced nearly all management strategies and decisions of the organization, from those concerning planning, budgeting, and scheduling to allocation of resources. The Management Subteam believes production and profitability are still the primary controlling forces, since the alternative is to cease operations and close the field if it were to become a financial burden to the taxpayers. DOE and the contractor organization also recognize the importance of the requirement for an enhanced environment, safety, and health (ES&H) program to achieve the Secretary of Energy's stated objectives. Although DOE/NPOSR-CWIN and their operating contractor seem to be making a sincere effort to fulfill their responsibilities and obligations, ES&H is still not perceived as a mission equal in status with production and profitability.

The inherent risks associated with the operation of a natural gas or oil field, coupled with a marginally effective ES&H program and capabilities, have the potential to produce an unacceptable risk to the environment as well as to the safety and health of workers and to the public. This potential is even greater when the primary motivation is production and profitability. The interpretation of the legislative mandate, which is believed to be beyond the power of DOE Headquarters or the field organization to change, potentially represents a significant barrier to the achievement of the level of ES&H excellence expected by the Secretary.

The Management Subteam identified 30 findings (including 6 self-assessment findings in Section 6.0) that pertain to both DOE's and the operating contractor's approach to achievement of ES&H objectives. These 30 findings have been distilled into 3 key findings which have a significant impact on all other areas examined by the Management Subteam: planning, training, and oversight. These findings heavily influence the ES&H functions and operations at the field organization, as well as DOE Headquarters, and represents the framework through which production and ES&H objectives are established and prioritized. Training is particularly important in the field organization due to the absence of technical expertise in several areas critical to the implementation of ES&H requirements. Even more importantly, the DOE and contractor organizations are attempting to design and implement a cohesive ES&H program without a thorough knowledge of DOE Orders and directives. Oversight is the process of ensuring and verifying that production and ES&H objectives are being achieved, and is critical to the success of both field operations and the implementation of an effective ES&H program. For these reasons, planning, training, and oversight are addressed as key findings.

• DOE (FE, DOE/NPOSR, DOE/NPOSR-CWIN) and the operating contractor have not developed an effective, self-initiated, strategic or operational planning process to ensure that proposed courses of action to implement a comprehensive ES&H program can realistically be accomplished and integrated with operating objectives. A significant increase in funding allocation is not likely to provide the means to accomplish ES&H objectives within NPOSR-CWIN, since outlay expenditures are constrained by the legislative mandate to maintain production and profitability. Therefore, difficult decisions must be made to divert funding and staffing resources from operations activities to support the formulation and implementation of an ES&H program that will fully comply with DOE Orders and directives. Planning and budgeting activities, at the DOE Headquarters and field levels, have neither reflected these difficult decisions nor charted a clear course as to how those ES&H objectives are to be accomplished in the near term.

Strategic plans generated by DOE Headquarters should establish important goals and objectives at the macro level. However, they are not a substitute for self-generated strategic and operational planning at the field level. DOE/NPOSR-CWIN has made no visible effort to develop plans or strategies to examine alternatives or fallback options under the prevailing legislative mandate for production and profitable operations. This type of planning should provide the basic framework for well reasoned decisions regarding trade-offs between production and ES&H considerations. It should also provide a means of prioritizing and scheduling specific actions to be taken and the resources required to support those actions. Strategic and operational planning also establish the mechanism to analyze the potential downstream consequences of those decisions in order to minimize unexpected events during implementation.

2.3.2 Annual Safety and Health Goals

Although the Secretary of Energy has neither established clear safety and health performance standards for DOE's field operations, nor have DOE/NPOSR-CWIN and its contractors established specific goals and direct it to all levels of the organization. DOE/NPOSR-CWIN and its contractors have neither been distillated into 3 key findings which have a significant impact on all other areas examined by the Management Subteam: planning, training, and oversight. These findings heavily influence the ES&H functions and operations of the field organization, as well as DOE Headquarters, and represents the framework through which production and ES&H objectives are established and prioritized. Training is particularly important in the field organization due to the absence of technical expertise in several areas critical to the implementation of ES&H requirements. Even more importantly, the DOE and contractor organizations are attempting to design and implement a cohesive ES&H program without a thorough knowledge of DOE Orders and directives. Oversight is the process of ensuring and verifying that production and ES&H objectives are being achieved, and is critical to the success of both field operations and the implementation of an effective ES&H program. For these reasons, planning, training, and oversight are addressed as key findings.

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2-7
commitment tracking systems) have either not been developed or are informal and inadequate. Formal assessment and review activities have been minimal at all levels, and oversight of several ES&H functional areas has been nonexistent. The assessment process involves little planning, coordinating, scheduling, documenting of results, tracking findings to verify closure, or identifying and correcting root causes.

2.3.2 Root Causes
The Management Subteam reviewed concerns and findings, and the individual causal factor analyses of the Environmental and Safety and Health Subteams, as well as those of its own to determine the most probable overall root cause. Root cause is defined as that most basic deficiency that, if corrected, will prevent recurrence of the problem.

The following root cause was determined to have contributed most directly to the deficiencies identified by the NPOSR-CUW Tiger Team.

- The continuing emphasis on program mission orientation has inhibited DOE (FE/NPOSR/NPOSR-CUW) and the operating contractor from establishing a fully effective environment, safety, and health program and from achieving DOE's overall goal of ES&H excellence. The commercial oil field style and philosophy of management and operations, that is centered around production and profitability, is a legacy of the more than 70 year history of NPR-3. Although the stewardship of NPR-3 is has progressed through several Federal agencies, the oil field mentality has prevailed, and today the primary focus of management attention is on production and profitability. As a result, the primary frame of reference or culture for NPOSR-CUW personnel with respect to ES&H needs is typical of that for commercial oil and gas operations. Contributing to this culture is the fact that FE: (1) is involved in program activities that are inherently ES&H-related (e.g., clean coal technology), (2) does not operate high risk nuclear sites, and (3) considers the risks associated with their operations to be lower than comparable commercial fossil energy facilities. Statements made by DOE management personnel in FE, NPOSR, and NPOSR-CUW indicate that these conditions have lead FE and NPOSR to consider their operations unique "legalistic" requirements that do not really apply to NPOSR-CUW operations. Consequently, this competitive, profit-driven, "we are unique" culture has instilled within management at all levels (i.e., FE through the operating contractor) a reluctance to fully accept the applicability, value, and need for a formal, dynamic ES&H program. The findings and concerns identified by this Tiger Team Assessment demonstrate the consequences of that reluctance.

Although the Secretary of Energy's stated ES&H initiatives have been a matter of record for more than 3 years, the philosophy and orientation described above, combined with a real possibility of declining budget and manpower allocations, has resulted in inadequate allocation of resources needed to develop and maintain

Management systems vital to the conduct of oversight (e.g., formal policies and procedures, directives, corrective action, and
an effective ES&H program. Typically, ES&H has been treated as an additional burden to be considered in, but not to interfere with, production responsibilities. Alternative vehicles to providing the needed ES&H expertise and program elements have not been adequately explored or exploited.

The NPOSR-CUW oilfield culture, coupled with FE's attitude of uniqueness, has resulted in an absence of rigor and formality in the management of ES&H programs, as cited in many Tiger Team Environmental, Safety and Health, and Management Subteam Findings, Concerns, and causal factors. There is an overall lack of formal ES&H policies, plans, and procedures and, generally, inadequate documentation of ES&H-related activities. An ES&H program strategy and associated staffing plan and many crucial ES&H management systems have not been fully developed or implemented.
3.0 ENVIRONMENTAL ASSESSMENT

3.1 PURPOSE

The purpose of the Environmental portion of the Tiger Team Assessment is to provide the Secretary of Energy with information on current environmental compliance status and associated vulnerabilities of each facility, root causes for noncompliance, adequacy of DOE and site contractor environmental management programs, and adequacy of response actions to address identified problem areas. The results of the assessment will aid in tracking DOE-wide environmental compliance trends.

3.2 SCOPE

The scope of the NPOSR-CUW environmental assessment was comprehensive, addressing all environmental media and applicable Federal, state, and local regulations and requirements, DOE Orders, and best management practices. The environmental disciplines addressed in this assessment include air; surface water; groundwater/soils, sediments, and biota; waste management; toxic and chemical materials; quality assurance; radiation; inactive waste sites; and the requirements of the National Environmental Policy Act (NEPA).

Field work was conducted at NOSR-1 and NOSR-3 in Colorado and NPR-3 in Wyoming. The disciplines that received the most intense review were groundwater, surface water, and inactive waste sites; however, the other disciplines were reviewed on a more limited basis during the field work in Colorado. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the assessment.

3.3 APPROACH

The Environmental Subteam assessment of NPOSR-CUW was conducted in accordance with the Tiger Team Guidance Manual (February 1990) and the DOE Environmental Audit Program Guidance (January 1992) and followed accepted assessment techniques. The assessment was conducted by a team managed by a Team Leader and two Deputy Team Leaders from the Office of Environmental Audit. The team consisted of a multidisciplinary group of technical specialists provided by a support contractor and by DOE’s Office of NEPA Oversight. The names, responsibilities, affiliations, and biographical data of the team leaders and specialists are provided in Appendix A-2.

The environmental assessment of NPOSR-CUW included three phases: planning and preparation, onsite activities, and reporting. During the planning and preparation phase, a letter was sent to NPOSR-CUW requesting information about the site. A preassessment site visit was conducted April 28-30, 1992. Information gathered from both the response to the information request letter and the preassessment site visit formed the basis for the Environmental Subteam’s Assessment Plan, provided in Appendix B, and onsite agenda. Once onsite, the subteam members modified the original agenda as more information was obtained and additional areas of interest were identified. The overall schedule and the daily agenda, which reflect the NPOSR-CUW areas addressed by the Environmental Subteam, is included as Appendix C.

The NPOSR-CUW Tiger Team Assessment officially began on June 22, 1992, and concluded on July 20, 1992. However, since the Environmental Subteam was
required to assess sites located in both Wyoming and Colorado, it was necessary to begin the environmental portion of the assessment field work on June 15, 1992. Field activities for the environmental portion of the assessment concluded on June 29, 1992. These activities included a review of internal documents and reports from previous audits and assessments; interviews with DOE and site contractor personnel and personnel from Federal and state regulatory agencies; and inspections and observations of facilities and operations. The Environmental Subteam held daily debriefs, which were open to DOE, site personnel, and regulatory agency representatives. During the debriefs, the audience was encouraged to provide the Environmental Subteam with additional information and clarification as appropriate. Using these sources of information, the Environmental Subteam developed findings as discussed in Sections 3.4 and 3.5. The findings development procedure included validation employing a formal Factual Accuracy Review process with DOE and site contractor personnel.

The Environmental Subteam identified findings in two categories: compliance findings (CFs) and best management practice findings (BMPFs). Compliance findings represent conditions which, in the judgment of the Environmental Subteam, may not satisfy the requirements of environmental regulations, DOE Orders (including internal DOE directive memoranda, where referenced), consent orders, and agreements with regulatory agencies, permit conditions, or site directives/procedures/action plans. Best management practice findings represent situations where, in the judgment of the Environmental Subteam, sound, accepted management practices are not being employed.

No noteworthy practices were identified as part of this assessment. A noteworthy practice is a finding which, in the judgment of the assessment team, will have general application at other DOE facilities/operations. However, the lack of noteworthy practices is not an indication of a deficiency.

3.4 ENVIRONMENTAL ASSESSMENT SUMMARY

The Environmental Subteam identified 62 findings and 1 special issue in the assessment of NPOSR-CUW. Table 3-1 presents the title of each finding. None of the findings represent situations that present an immediate threat to public health or the environment, or that require an immediate cessation of operations. Fifty-nine of the findings reflect problems that may not meet the requirements of Federal, state, or local regulations, DOE Orders, or NPOSR-CUW directives or procedures. Three findings represent conditions where best management practices have not been employed. A breakdown of environmental findings by technical discipline is presented graphically in Figure 3-1. The apparent causal factor(s) for each finding is based on the professional judgment of the Environmental Subteam specialist. A listing of the causal factors identified for each of the environmental findings is presented in Table 3-2. The frequency of occurrence for the identified causal factors is presented in Figure 3-2.
### TABLE 3-1
ENVIROMENTAL FINDINGS

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<tr>
<th>Page No.</th>
<th>Finding No.</th>
<th>Finding Title</th>
<th>DOE/NPOSR-CUM Self-Assessment</th>
<th>JBEF Self-Assessment</th>
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#### ENVIRONMENTAL FINDINGS

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<td>P</td>
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<td>3-172</td>
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<td>Status of Shale Pile at NOSR-3</td>
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<td>NEPA/CF-4</td>
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<td>3-185</td>
<td>NEPA/CF-5</td>
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F  Fully Identified
P  Partially Identified
N  Not Identified
NA Not Applicable
### Table 3-2

**Summary of Apparent Causal Factors Identified by Assessment Finding**

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<tr>
<td>A/CF-3</td>
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<tr>
<td>SW/CF-1</td>
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**SUMMARY OF APPARENT CAUSAL FACTORS IDENTIFIED BY ASSESSMENT FINDING**

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<td>✓ ✓ ✓</td>
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SUMMARY OF APPARENT CAUSAL FACTORS IDENTIFIED BY ASSESSMENT FINDING

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WASTE MANAGEMENT (WM)

<p>| WM/CF-1 | ✓ | ✓ | ✓ |
| WM/CF-2 | ✓ | ✓ |   |
| WM/CF-3 | ✓ |   |   |
| WM/CF-4 | ✓ | ✓ |   |
| WM/CF-5 | ✓ | ✓ | ✓ |
| WM/CF-6 | ✓ | ✓ |   |
| WM/CF-7 | ✓ |   | ✓ |
| WM/CF-8 | ✓ | ✓ |   |
| WM/CF-9 | ✓ |   | ✓ |
| WM/CF-10| ✓ | ✓ |   |
| WM/CF-11| ✓ |   | ✓ |</p>
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**TOXIC AND CHEMICAL MATERIALS (TCM)**
- TCM/CF-1: / / /
- TCM/CF-2: / / /
- TCM/CF-3: / / /
- TCM/CF-4: / / /

**QUALITY ASSURANCE (QA)**
- QA/CF-1: /
- QA/CF-2: /
- QA/CF-3: /
- QA/CF-4: /
- QA/CF-5: / / /
- QA/CF-6: / /
- QA/CF-7: /
- QA/CF-8: /

**QUALITY ASSURANCE (Continued)**
- QA/CF-9: / / /
- QA/CF-10: / / /

*TABLE 3-2 (Continued)*
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<tr>
<td>INACTIVE WASTE SITES (IWS)</td>
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ENVIRONMENTAL FINDINGS BY DISCIPLINE

**FIGURE 3-1**

- Compliance Findings
- Best Management Practice Findings

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<th>Best Management Practice Findings</th>
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<tr>
<td>NEPA</td>
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**ENVIRONMENTAL FINDINGS SUMMARY**

- 62 Findings
- 95%
- 5%
FIGURE 3-2
NUMBER OF FINDINGS PER CAUSAL FACTOR
As part of the environmental assessment of NPOSR-CUW, the Environmental Subteam reviewed recent reports related to environmental compliance. Most important among those were the Naval Petroleum and Oil Shale Reserves Colorado, Utah, and Wyoming Self Assessment Report (April 1992) and the John Brown E & C Naval Petroleum and Oil Shale Reserves Colorado, Utah, and Wyoming Environmental Self-Assessment (April 1992) (referred to as the DOE/NPOSR-CUW self-assessment (April 1992) and JBOC self-assessment (April 1992) throughout Section 3.0). The Environmental Subteam evaluated the effectiveness of these assessments and their implementation to the Tiger Team environmental assessment. Table 3-1 presents a summary of the results of the evaluation. Tiger Team findings are categorized as having been fully identified, partially identified, or not identified by the DOE/NPOSR-CUW and JBOC self-assessments. Of the 62 environmental findings identified by the Environmental Subteam, 31 percent were fully identified, 47 percent were partially identified, and 22 percent were not identified in the DOE/NPOSR-CUW self-assessment. Of the 60 findings which led to JBOC, 36 percent were fully identified, 42 percent were partially identified, and 22 percent were not identified in the JBOC Self-Assessment Report.

It should be noted, however, that the environmental portions of both self-assessments appeared to be completed primarily by comparing existing practices to DOE/EA-0229, "Performance Objectives and Criteria for Conducting DOE Environmental Audits." There is relatively little evidence that direct observation of specific noncompliances or environmental management activities contributed very often to development of the self-assessment findings. Thus, the findings were not well substantiated with specifics, nor were their impacts on DOE/NPOSR-CUW operations identified or documented. The self-assessment programs are further discussed in Section 6.0 of this report.

The Environmental Survey Preliminary Report, February 1989, identified 19 relevant findings. As of July 1992, seven of these findings have been completed. The other 12 findings, in the judgment of the Environmental Subteam, have not been completely resolved and are reflected in this assessment report.

Environmental Management Structure

DOE oversight is provided through the Director, NPOSR-CUW, who establishes the overall policy and guidance to be used for oversight. The Assistant Director, NPOSR-CUW, supervises DOE personnel and delegates primary oversight responsibility to the Environmental Protection Specialist. Secondary responsibility for oversight, observation, and information gathering is assigned to the Director of Engineering, his staff of engineers, and to the Director of Contract Surveillance and his staff of contract administrators. Although the secondary oversight personnel have limited training in environmental laws and regulations, they are not fully trained to provide specialized environmental oversight. They are, however, very familiar with operational issues and serve to provide information to the Environmental Protection Specialist when questionable situations are observed during field visits. The Environmental Protection Specialist can then evaluate the issue and provide the correct guidance.

Observations are brought to the attention of the Award Fee Performance Evaluation Committee on a monthly basis, discussed by the committee members, and reduced to a monthly report provided to the maintenance and operations (M&B) contractor, John Brown Engineers and Constructors Inc. (JBOC). At the end of the award fee period (6 months) the Award Fee Board considers the performance for the entire 6-month period.

Management oversight of the contractor environmental program at NPOSR-CUW is provided through the Facilities Manager and Environmental Manager, who reports to the General Manager. The responsibility for environmental programs lies with the Environmental Manager and is monitored by DOE/NPOSR-CUW through the award fee process.

Program execution is accomplished by operations personnel who receive guidance from the Environmental Department Manager and staff. Operations personnel are headed by the Field Operations Manager.

Funding for hazardous material tests and specialized equipment is budgeted through an Environmental Job Order, which is separate from Operations Budgets.

In 1990, the contractor's position of ESH Manager was eliminated by creating separate positions for Environmental Manager and for Safety and Health Manager. An Environmental Specialist was hired soon thereafter and a second Environmental Specialist was hired in 1992.

Performance of NPOSR-CUW Environmental Program

Overall, the performance of the NPOSR-CUW environmental program requires considerable improvement to fully comply with Federal, state, and local laws and regulations, and DOE Orders. Programmatic environmental issues at NPOSR-CUW are reasonably well understood, as demonstrated by the DOE and contractor's self-assessments. However, the self-assessments have not been institutionalized and the corrective action program has not been implemented. Historically, operations have been conducted with a lack of formality, and responsibilities for environmental compliance were fragmented across the site. There were some fundamental findings in the areas of formality of environmental programs, regulations, environmental monitoring, and quality assurance. Currently, the site lacks the necessary environmental expertise and resources to develop effective environmental protection programs and oversee line organizations' implementation of these programs. The implementation of the regulatory system in place to ensure full communications and implementation of regulatory requirements and DOE Orders. However, the personnel were cooperative and receptive to suggestions from the Tiger Team specialists.

Environmental Key Findings

- Formality of Environmental Programs, Policies, Procedures, and Training. NPOSR-CUW lacks a formalized environmental management program with policies, plans, procedures, and training sufficient to ensure compliance with all environmental laws, regulations, and DOE Orders. Many of the environmental protection documents required by DOE $400.1 either do not exist, or are not of sufficient quality or scope. These include the Waste Minimization Plan, the Pollution Prevention Awareness Plan, the Environmental Monitoring Plan, and the Groundwater Protection Management Plan.

The implementation of the plans that have been written is deficient in many areas. Most of the environmental protection activities are done without formal procedures and training of
personnel. This concern is prevalent across all of the environmental protection disciplines. Additionally, documentation related to environmental protection and compliance was found to be chronically deficient at NPOSR-CUW. The lack of formality of NPOSR-CUW’s environmental activities is partially the result of the personnel assigned to implement and oversee the environmental protection programs; they are not of sufficient number and do not have adequate experience and training. The lack of formality in environmental programs has contributed to the slow progress since 1989 to resolve environmental protection issues. The 1998 DOE Environmental Survey and assessments conducted by subcontractors in 1990 and 1991 identified many findings, concerns, and issues that could have been addressed before the Tiger Team Assessment. There has been a failure to properly communicate DOE policies and requirements throughout NPOSR-CUW. Within DOE/NPOSR-CUW, not all DOE Orders have been reviewed for relevance at NPOSR-CUW and for those reviewed, guidance was less than adequate in some cases.

- Quality Assurance and Oversight. Environmental quality assurance (QA) programs have not been completely implemented by NPOSR-CUW. Environmental QA program plans have been prepared and submitted by DOE/NPOSR-CUW and John Brown Engineers and Constructors Inc. (JBEC) to the DOE Office of Fossil Energy (FE) for approval. However, NPOSR-CUW has not allocated resources to implement this program. Elements of an environmental QA program that have not been implemented include use of formal procedures, personnel training, audits/corrective actions, oversight of the contractor and subcontractors, data validation, and recordkeeping. Within DOE/NPOSR-CUW, the QA Officer does not have sufficient independence, is not allotted sufficient time to perform all of the elements of an environmental QA program, and has limited quality assurance training. Within JBEC, the QA function has improved recently due to the hiring of a key specialist who will address quality issues on a full-time basis. The overall QA function, however, does not adequately address environmental QA. Audits and assessments have not been effectively implemented because of a lack of procedures and training. The lack of formal QA at NPOSR-CUW is apparently caused by a lack of DOE/NPOSR-CUW and JBEC management recognition of this need.

- NPOSR-CUW lacks a basic overall understanding of QA oversight as a fundamental management tool to ensure that all environmental activities are performed in compliance with environmental laws, regulations, and DOE Orders. QA oversight is also essential to ensure that the data obtained from analytical support services are of known quality and are defensible. DOE/NPOSR-CUW and JBEC have not implemented a formal program of oversight to ensure that plans and actions for QA are established, understood, and implemented.

- Environmental Monitoring and Protection Programs. Many of the environmental monitoring and protection programs at NPOSR-CUW have fundamental deficiencies. Deficiencies have been identified in the groundwater, air, and surface water programs, and the validity of monitoring data for all media is in question because of weaknesses in sampling practices. Groundwater injection management programs and sitewide hydrogeologic monitoring well networks have not been established. Inadequate plugging and abandonment practices for inactive and abandoned monitoring wells and cased boreholes present potential pathways for groundwater contamination. A formal air quality management program has not been developed to determine applicable Federal and state requirements and to address compliance status. Air quality surveillance has not been performed to monitor the effects, if any, of NPOSR-CUW activities on onsite and offsite environmental and natural resources. There is no meteorological monitoring program to provide meteorological information in support of air management and emergency response activities. A complete source control and assessment program to quantify emissions, which is needed for evaluation of prevention of significant deterioration source status, does not exist. A concern at NOSR-3 is the possible collapse of the shale pile and its potential impact on waters of the United States.

Many of the deficiencies at NPOSR-CUW can be attributed to a lack of qualified personnel, inadequate allocation of personnel resources, and a general lack of understanding of environmental laws, regulations, and DOE Orders. The roles, responsibilities, and authorities have not been clearly defined in DOE/NPOSR-CUW and JBEC, so that effective environmental programs can be implemented. The self-assessment program has not been institutionalized and a corrective action program has not been implemented.

- Waste Management. NPOSR-CUW has not developed a waste management program that defines roles and responsibilities, procedures, and training and qualifications. The lack of formal procedures has resulted in considerable deficiencies in the area of waste management. The critical waste management issue identified during the Tiger Team Assessment involved inadequate recordkeeping. NPOSR-CUW does not provide documentation to determine its RCRA generator status, which is necessary to establish applicable hazardous waste management requirements. Another significant issue is waste characterization. NPOSR-CUW does not have a program to characterize both hazardous and nonhazardous wastes, resulting in several instances of noncompliance with Federal and state requirements. NPOSR-CUW’s management of waste accumulation, treatment, and disposal facilities is deficient as evidenced by a lack of required notifications to regulatory agencies, design inadequacies, and improper operations. These deficiencies can be attributed to a lack of oversight (by both JBEC and DOE/NPOSR-CUW) and a lack of procedures to ensure compliance with DOE, U.S. Environmental Protection Act (EPA), and state requirements. Insufficient laws with employees responsible for the day-to-day conduct of waste management operations indicated a consistent lack of knowledge with respect to regulatory requirements. These employees have not been provided with training and formal operational guidance that would ensure compliance with regulatory requirements. Formality of Environmental Programs, Policies,
Procedures, and Training. NPOSR-CUW lacks a formalized environmental management program with policies, plans, procedures, and training sufficient to ensure compliance with all environmental laws, regulations, and DOE Orders. Many of the environmental protection documents required by DOE 5400.1 either do not exist, or are not of sufficient quality or scope. These include the Waste Minimization Plan, the Pollution Prevention Awareness Plan, the Environmental Monitoring Plan, and the Groundwater Protection Management Plan. The implementation of the plans that have been written is deficient in many areas. Most of the environmental protection activities are done without formal procedures and training of personnel. This concern is prevalent across all of the environmental protection disciplines. Additionally, documentation related to environmental protection and compliance was found to be chronically deficient at NPOSR-CUW.

3.5 ENVIRONMENTAL FINDINGS

The Environmental Subteam findings are presented in Sections 3.5.1 through 3.5.9. The findings are grouped by discipline and are preceded by an overview. The overview describes the following: the scope of the assessment, the approach taken by the technical specialist in conducting that portion of the assessment, a description of the NPOSR-CUW programs and activities related to that discipline, status of the 1988 Environmental Survey, an overall characterization of strengths and weaknesses of the NPOSR-CUW programs, and a brief summary of the findings.

Within each finding, references to other findings, interviews, and documents are presented parenthetically. An example of a referenced finding is (see Finding A/CF-1), where "A" represents the air discipline, "CF" represents a compliance finding, and "1" is the finding number. An example of a referenced interview is (I-SW-2), where "I" signifies interview, "SW" represents the Surface Water discipline, and "2" represents the interview number. An example of a referenced document is (WM-3), where "WM" represents the Waste Management discipline, and "3" represents the document number. Appendices D and E list the contacts/interviews and site documents, respectively, the Environmental Subteam used to develop its findings. In addition, causal factors are discussed in each finding, as summarized in Table 3-2. The definitions of the causal factors are presented in Appendix G.

3.5.1 Air

3.5.1.1 Overview

The air portion of the Environmental Subteam assessment at NPOSR-CUW evaluated current operating procedures and air quality programs with regard to requirements of U.S. Environmental Protection Agency (EPA) regulations, Wyoming Department of Environmental Quality (WYDEQ) Air Quality Standards and Regulations, WYDEQ air permits, Colorado Department of Health Air Quality Control Commission Regulations, DOE Orders, operating contractor policies and procedures, and best management practices. The regulations, requirements, and guidelines used in this assessment are presented in Table 3-3.

The primary focus of the air assessment was the activities at NPR-3. There was a review in Casper of NOSR-1 and NOSR-3 documents related to air quality compliance and decontamination and demolition activities, including asbestos abatement, and there was a limited assessment of air issues by a member of the Environmental Subteam during his field work at NOSR-1 and NOSR-3. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the scope of the air assessment.

The general approach to the NPOSR-CUW air assessment was to inspect facilities and operations, conduct interviews, and review documents related to air quality to determine: (1) the regulatory and organizational context of the sites, (2) the emission sources and the nature of the contaminants released, (3) the adequacy of programs for emission sources, controls, and permits, (4) the adequacy of programs for managing air quality compliance requirements, and (5) whether appropriate air quality and meteorological monitoring programs are in place.

The inspection of air emission sources, monitoring and control equipment, and standard operating practices during the assessment provided information about regulatory compliance status and conformance with DOE requirements. Site documents, records, programs, and procedures were reviewed for adequacy and to determine whether they contained appropriate air quality and meteorological information. The DOE/NPOSR-CUW and JEB personnel were interviewed to discuss their roles and responsibilities with regard to emission control and air quality management. Regulatory documents and agency correspondence were reviewed, and regulators were contacted to confirm interpretations and completeness of the various requirements known to apply at NPOSR-CUW.

NPR-3 is located in Natrona County, Wyoming. One of the public air quality monitoring stations for particulate is located in the city of Casper (Natrona County), and the WYDEQ Air Quality Division does not operate continuous monitors for other criteria pollutants anywhere in the state (I-A-38). However, the state is in attainment for all criteria pollutant: regulated under the Clean Air Act (I-A-35), with the sole exception of particulate in the Trona Industrial Area (Sweetwater County).
NPR-3 is subject to various general state and Federal air regulations and several air permits. Wyoming air inspectors have visited the site periodically (A-5), most recently at DOE’s request (I-A-25). The state has requested and received annual emission inventory reports from NPR-3 (A-7, A-9, and A-12) as well as information regarding air toxics (hazardous air pollutants (HAPs)) emitted.

NOSR-1 and NOSR-3 are located in Garfield County, Colorado, which is in attainment for all criteria pollutants. These sites are subject to the general Colorado and Federal air pollution regulations. There is an active permit for the Parachute Field Gas Compressor and a permit to vent nitrogen during stimulations of NOSR gas wells.

In the JPEC organization, environmental concerns at NPOS-CUW were officially the responsibility of the JPEC Safety and Environmental Manager. This position has been split so JPEC has a separate environmental manager who must cover air quality issues. An Environmental Specialist, who reports to the Environmental Manager, is officially assigned to monitor air quality permit compliance and prepare permits (A-137). Several other departments are involved in air compliance. The Technical Services Department provides facility design for most of the larger air emission sources and expanded production projects and contracts (I-A-8 and I-A-31), and the Administration Department conducts procurement and budgeting. Production and maintenance organizations at the field operate and maintain air emission sources.

DOE/NPOS-CUW created a full-time environmental position in 1991 with reporting responsibilities to the Assistant Director. The Contracting and Engineering offices performed many of the environmental oversight functions before that time and continue to support the environmental program today.

Air contaminants at NPR-3 are produced or emitted by four steam generators; vented wells; heaters at the Low Temperature Separation (LTS) Gas Plant, tank batteries, and test satellites; production tanks; leaks or releases in gas handling systems; the flare at the LTS Gas Plant; several maintenance and machine shops; pits for evaporating waste sludges; and storage of fuels and other volatile liquids. Road use, road maintenance, construction, WYDEQ and well drilling create emissions as well.

Air emissions include nitrogen oxides (NOₓ), particulate (PMₓ), and carbon monoxide (CO) which are emitted from the generators and heaters. Production and organics storage activities emit volatile organic compounds (VOC). PMₓ emissions are produced by drilling and road use. Wells, storage tanks, and pits emit methane, hydrogen sulfide (H₂S), and other volatile organic compounds. NOSR production, property control, warehouse, and the environmental operations all collect various kinds of information that relate to the types of air polluting equipment, operations, and emissions at NPOS-CUW. Several HAPs covered by the Clean Air Act Amendments (CAA) list are used at NPOS-CUW and may be emitted. These include methanol, ethylene glycol, ethylene thiourea, benzene, ethyl benzene, methylene chloride, naphthalene, chloroacetic acid, hexane, xylenes, bis-(2-ethylhexyl) phthalate, and hydrochloric acid (A-7).

H₂S and NOₓ emissions at NPR-3 were negligible prior to development of the enhanced oil recovery project. After evaluating recovery techniques, JPEC selected steam drive injection and designed and installed gas-fired steam...
generators, each capable of producing 50 MMBtu/hr of steam. These have increased the site's NOx emissions significantly, and steam injection has resulted in increased H2S emissions from vented wells, test satellites, and tank batteries.

JBEC has conducted some H2S emission source testing at tank batteries, test satellites, and some production wells, but to date there is no definitive data on emission rates and totals from all sources (A-77 and A-125).

Environmental staff are spot checking ambient H2S levels in designated "H2S Areas" (A-76) and are planning to monitor the three main crude oil storage areas in the Shannon Steam Drive Project, a multi-department project team is investigating emission control options (A-37 and A-44).

Air emission control equipment and techniques used at NPR-3 include a floating roof at the South Terminal Sales Tank, excess air controls on three of the four operating steam generators, and an iron sponge H2S unit and flare at the LTS Gatherplant. There are few procedures for operation, maintenance, and none include environmental performance measures. All sources at NPOSR-CUM are subject to Wyoming Air Quality Standards and Regulations (WYASQR), which limits visible air contaminants in any emission discharge to 40 percent opacity.

NPOSR-CUM has submitted many preconstruction applications for air permits from the WYDEQ for its Firefood Pilot Project, steam generators, Gas Plant, oil storage tanks, and heaters (A-86, 96, 127, 133, and 135). The application for a fifth steam generator was submitted in 1991, and the facility is now under construction. Each JBEC department makes its own determination of whether new production projects, materials, or facility modifications require air permits or notice to the WYDEQ Air Quality Division. Preliminary specifications for significant projects are sent to all JBEC department heads for review (A-131 and A-132).

The steam generator permits include emission limitations for NOx and particulate (A-85, 93, 104, 107, and 108). A smokeless flare for the produced gas emissions and quarterly reports were required by the permit for the in situ combustion pilot project (A-88 and A-91). Some of the original heater permits were modified or canceled either because of removal through maintenance, and none include environmental performance measures. All sources at NPR-3 partially addresses the Environmental Survey concern about release of friable asbestos, but it has not been carried out. The fourth air quality issue was related to the air monitoring program.

Generally, the site meets compliance levels. NPOSR-CUM has applied for appropriate air quality permits over the last 12 years and has submitted emission monitoring reports to WYDEQ each year as required. Some new generators were tested during startup, as required, and ambient and meteorological monitoring has been conducted. However, coherent and comprehensive oversight does not currently exist at NPR-3, and there is no formal air quality management program that would guide decisions on air quality compliance at any of the three sites. The lack of a program is reflected in some minor discrepancies and emissions on applications and the poor level of information about emission and impacts, as reflected in the unresolved issues for H2S emissions from the Shannon Steam Drive Project. The lack of a program could result in significant problems if emissions are inadvertently increased or more sources are added to this major prevention of significant deterioration (PSD) air quality source

The air assessment identified six compliance findings and one best management practice finding. The compliance findings relate to the absence of formal monitoring programs for ambient air surveillance and for meteorological information; deficiencies in operating procedures; the lack of an air quality management program; an inadequate source control and evaluation program; and an inadequate program to meet vehicle fuel requirements. The best management practice finding is related to the absence of an asbestos management program.

(A-5, 6, 7, 12, 49, 67, and 86). However, NPR-3 has no summary records of source sizes, aggregate characteristics, or inventory of its emission quantity (I-A-24, I-A-25, and I-A-34) to confirm and track this status.

NPR-3 facilities are relatively new and contain few, if any, asbestos-containing materials (I-A-18). NOSR-1 and NOSR-3 sites have a significant amount of friable and nonfriable asbestos containing materials, which poses a potential risk of release. Removal and abatement projects have been planned, and site NEPA documents indicate that safety and environmental regulations will be adhered to (I-A-8 and I-A-40).

NPOSR-CUM does not currently conduct meteorological monitoring, and ambient air quality surveillance and source emission monitoring activities are limited (I-A-11, 23, 24, and 55). However, there are several discrete sets of onsite air quality and meteorological data that have been collected over the past 10 years in conjunction with individual production enhancement projects. Meteorological data from the Casper weather service is used informally in conducting the ongoing H2S monitoring study (A-1-11).

The site has not resolved any of the four air-related issues cited in the 1988 Environmental Survey but has addressed, to some extent, the hydrocarbon emissions from wells, batteries, and satellites and the lack of operating permits. A project to remove asbestos-containing materials from buildings at NOSR-3 partially addresses the Environmental Survey concern about release of friable asbestos, but it has not been carried out. The fourth air quality issue was related to the air monitoring program.
3.5.1.2 Compliance Findings

FINDING A/CF-1: Air Quality Management Program

Performance Objectives

DOE 5400.1, "General Environmental Protection Program," states "it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards. In addition, DOE is committed to good environmental management of all its programs." Section S.6 requires that Heads of Field Organizations "ensure that all operations under their authority comply with applicable environmental protection laws and regulations."

DOE 5400.2A, Section 4.a, "Environmental Compliance Issue Coordination," defines Significant Environmental Compliance Issues to include "results of verification activities ... that reveal non-compliance issues" and requires that Heads of Field Elements shall "provide EH-23 information on all environmental permits."

40 CFR 52.21, "Prevention of Significant Deterioration of Air Quality," (PSD) defines the emission limits and capacity size of "major" sources subject to this program and provides threshold levels for emission increases and impacts of nitrogen oxides (NOx), hydrogen sulfide (H2S), and other pollutants that trigger PSD preconstruction permit review for facility modifications.

Wyoming Air Quality Standards and Regulations (WyAQS) Section 21, "Permit Requirements for Construction, Modification and Operation," requires a permit application for construction or modification of new or modified facilities, or for use of existing facilities that will emit contaminants or increase emissions into the air of the state. Wyoming Department of Environmental Quality (WDEQ) approvals of these applications are waived for minor sources which the Division of Air Quality's Administrator determines to be insignificant.

WyAQS, Section 9(a), "Hydrocarbons," requires that "hydrocarbon emissions shall be limited by all persons ... to prevent unnecessary emissions." Section 14, "Control of Particulate Emissions" requires that all persons must prevent unnecessary fugitive dust emissions exceeding ambient air standards by using oil or chemicals on roads and filters and enclosures for handling dusty materials. Section 13(b)(1), "Open burning restrictions," requires that applications be submitted to the WDEQ for training fires after they have been approved by local fire departments.

Finding

NPOS-CUW has not developed or implemented a formal program to determine the applicable Federal and state air program requirements and to assess compliance status, as required by DOE Orders.

Discussion

There is no air quality program in place at NPOS-CUW to determine what air requirements apply and whether the facilities are in compliance, to plan and provide guidance for new or modified facilities, to track permitted facilities and regulated activities, and to plan for compliance with upcoming requirements under Wyoming and Federal air programs.

NPOS-CUW has not conducted a formal overview of its emission source characteristics or aggregate inventory of its total emissions that would be sufficiently comprehensive to determine what requirements apply and whether the facilities are in compliance with source limits or ambient standards. The Environmental Subteam observed the following concerns:

NPOS-CUW and JBEC personnel (I-A-24, I-A-34, and I-A-36) are aware that PSD program emission thresholds have been exceeded, and any permitting for additional steam generators will likely be subject to PSD requirements, such as 1 year of preconstruction monitoring (A-6 and A-49). However, without a summary source list and emissions inventory, NPOSR has no documentation of their allowable or actual emissions nor records showing when the combined capacity of the generators became greater than 250 MMBtu/hr and, thus, defined the site as a "major" PSD source. All modifications at major sources that would increase emissions more than 10 tons/year of NOx or 40 tons/year of SO2 require PSD permits.

There is no procedure to include information on new emission sources and emissions (A-52, 53, 78, and 89; I-A-8, 10, 11, and 21) in the emission inventory or other environmental records.

Only limited ambient monitoring (A-42, 43, 44, and 60; I-A-25 and I-A-22) has been conducted to determine facility impacts at the NPOS-CUW sites (see Finding A/CF-2). NPOS-CUW has not evaluated these monitoring data (I-A-25 and I-A-36) nor performed impact assessment modeling (I-A-11) to assess air quality over appropriate periods of time to correspond with annual averages or daily, hourly, or half-hourly maxima established by ambient air quality standards. NPOS-CUW has not determined whether it can be exempted from air quality analysis for a PSD permit because it has not estimated the impact of expected emission changes to see if they are less than 10% per year. NPOSR has not determined the regulatory definition of ambient air quality at its facility (I-A-33), and, therefore, where H2S impacts should be evaluated.

Wyoming particulate control regulations apply to dust control on roads. Road maintenance practices required to control dust have been curtailed because the permit for oily sludge application has not been reissued (see Finding WM/CF-9).

There is no formal mechanism to determine whether future projects or changes in air emissions from facilities, production, or other practices would trigger new requirements or require permit applications. For example:

Modifications of tank uses are not reviewed for potential emission increases, or whether the tanks will still be used for petroleum liquids prior to custody transfer (A-135; I-A-8 and I-A-21).
Modifications to store other volatile liquids may require state permit applications and may subject these sources to performance specifications or emission limits (see Finding A/CF-4).

There is no formal process in place to ensure that all new sources or production activities that increase air emissions, such as the steam project expansion, are reviewed for environmental requirements (A-78 and A-89; I-A-8, 10, 11, 21, and 31) (see Finding NEPA/CF-4).

Currently, there is no formal review of purchase requisitions by the Environmental Department (I-A-1, I-A-29, and I-A-34); as a result, site personnel are able to bring equipment and/or materials onsite without an informed environmental review of emission impacts.

Contract specifications for a new generator did not reflect New Source Performance Standards or state permit environmental performance specifications (A-86).

The permit tracking system is not formal and recently, permit compliance has not been tracked. For example:

DOE/NPOSR-CUW relies on its contractor for compliance oversight at permitted facilities (I-A-25). While some documents summarize permits issued to NPR-3 (A-6) and a list was prepared for the Environmental Subteam information request, neither JBEC nor DOE/NPOSR-CUW currently have personnel specifically designated to track permits, determine whether other permits are needed, or monitor air permit compliance status.

There are no programs or procedures for air emission and source recordkeeping (see Finding A/CF-5) or reporting, although permits CT-850 and CT-937 have monitoring requirements.

DOE/NPOSR-CUW and JBEC have no systematic method of determining the impact of new regulations. For example, hazardous air pollutant (HAP) emissions have not been tallied in a comprehensive way (A-7), and it is not known whether more than 10 tons of any HAP or 25 tons in the aggregate are emitted from NPR-3 and whether it is a "major" HAP source that will have to meet Clean Air Act regulations to be promulgated in the near future. DOE EH-23 requested and received some data concerning HAPs from NPOSR-CUW in 1991, but there has been no further direction on implementing a program to prepare for regulatory changes.

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992) by generally stating that a management program was needed, and partially identified in the JBEC self-assessment (April 1992) because the assessment recommended programs for regulatory awareness and permit compliance, but did not address site source and emission tracking.

The apparent causal factors for this finding are a lack of policy implementation of DOE Orders with regard to oversight of compliance and development of management plans; a lack of procedures at NPOSR-CUW to ensure that new sources or emissions are evaluated to determine whether air permits or records are necessary; a change in site operations and organization addressing air quality concerns; and a lack of training for NPOSR-CUW personnel to implement laws and regulations. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews of existing projects and equipment at NPOSR-CUW to ensure that all the necessary air permits have been obtained.
FINDING A/CF-2: Ambient Air Surveillance Program

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 5.b(i), states "environmental surveillance shall be conducted to monitor the effects, if any, of DOE activities on onsite and offsite environmental and natural resources. An environmental surveillance screening program shall be undertaken ... to determine the need for a permanent program." It also requires that a surveillance program use "measurement, monitoring and calculation to determine the effects of the operations on the environment and public health."

Chapter IV, Section 8.b, states that air surveillance "monitoring programs should be designed to ... determine representative pollutant concentrations [impacts] at areas where public health and other concerns should be considered ... Where possible, background data should be gathered from existing State and Local Air Monitoring Stations (SLAMS) ...”

DOE 5500.3A, "Planning and Preparedness for Operational Emergencies," Section 2.b, states "For each potential Operational Emergency considered, the [hazard] assessment ... must address environmental transport and diffusion, and exposure considerations."

Finding

NPOSR-CUW has not developed an air quality surveillance program, undertaken a screening program to determine the need for a permanent program, nor evaluated whether the transport and diffusion of its emissions have the potential for causing significant pollutant concentrations or hazards, as required by DOE 5400.1, Chapter IV, and DOE 5500.3A.

Discussion

NPOSR-CUW has not developed and implemented a site-specific air surveillance program to measure or calculate the effects of its emissions (I-A-2 and I-A-11). No analysis of the potential air quality impacts from site releases has been performed, either to determine representative pollutant concentrations that may result or to define the highest concentrations ("hazards") and consequences of nonroutine releases (I-A-11, 16, 21, and 24).

No air quality monitoring has been conducted since 1989 (A-60; I-A-2, I-A-25, and I-A-33), and NPOSR-CUW has not formally evaluated its current needs for air quality monitoring at NPR-3, NOSR-1, or NOSR-3 (I-A-23 and I-A-34). Earlier monitoring studies have not been reviewed or integrated to determine whether data are of adequate quality and completeness or sufficiently representative (I-A-11 and I-A-22) for use in complying with Wyoming air quality standards; air permitting regulations, such as prevention of significant deterioration (PSD); and DOE Orders, or whether additional data will be needed.

Discussions to date to establish an onsite air quality monitoring program have not determined appropriate siting parameters nor determined which pollutants should be monitored (I-A-18, 22, 23, and 33). No air quality surveillance siting or monitoring plan has been prepared, and JBEC's proposal to DOE to activate a single monitoring station at NPR-3 during FY 1992 was not funded (I-A-3, 11, 33, and 34).

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992), but did not specifically refer to any ongoing or planned air contaminant monitoring. The finding was fully identified in the JBEC self-assessment (April 1992).

The apparent causal factors for this finding are a lack of policy implementation of the requirements of DOE 5400.1; inadequate resources devoted to planning and implementation; poor understanding of the risk of not having air quality surveillance information available; and inadequate training to understand and meet the requirements of the DOE Orders.
Finding A/CF-3: Meteorological Monitoring Program

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 6, requires DOE facilities to have a specific component of their monitoring programs that makes representative meteorological information available. These meteorological programs must be designed to characterize atmospheric transport and diffusion conditions, determine the impact of the site's routine and nonroutine air releases, and support environmental surveillance activities.

Finding

NPOSR-CUW has not developed or implemented a meteorological monitoring program, as required by DOE 5400.1.

Discussion

NPOSR-CUW does not have a formal meteorological monitoring program to provide meteorological information. The following deficiencies were observed related to the planning and implementation of a meteorological monitoring program:

- Representative locations to establish onsite meteorological monitoring stations at NPR-3, NOSR-1, and NOSR-3 have not been determined (I-A-18, 22, 23, and 33).
- A 1992 budget proposed by JBEC to reactivate the meteorological tower at NPR-3 was not funded (I-A-11, I-A-33, and I-A-34).
- NPOSR-CUW has not formally evaluated its current needs for meteorological information at NPR-3, NOSR-1, NOSR-2, and NOSR-3 (I-A-23 and I-A-34).
- Meteorological data were collected for discrete periods in conjunction with air quality monitoring for individual production enhancement projects, but meteorological monitoring equipment has not been operated since 1989 (A-60; I-A-22 through I-A-24). The data collected over the past 10 years have not been assessed to determine their quality or completeness, or whether they were representative (I-A-11 and I-A-22).
- NPOSR-CUW does not have appropriate or complete meteorological data available to use in modeling to determine the air quality impacts of new facilities or emission changes (I-A-22 and I-A-36). Upper air data are needed to meet monitoring data requirements for prevention of significant deterioration (PSD) permitting, for example, and would have to be obtained from another location that routinely collects this information.
- NPOSR-CUW does not have a formal program for obtaining meteorological monitoring data on a real-time basis during accidental releases, fires, or other weather sensitive events (I-A-33).

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992), but contained no detail on what was needed. It was partially identified in the JBEC self-assessment (April 1992), but JBEC did not address the need for meteorological information for emergency response nor the need for complete data to support permitting.

The apparent causal factors for this finding are a lack of policy implementation in that the requirements of DOE 5400.1 have not been implemented; resources have not been allocated for planning or monitoring activities; and personnel do not have adequate education and work experience to develop an acceptable program.
FINDING A/CF-4: Facility Air Effluent Control Programs

Performance Objectives

DOE 5400.1, "General Environmental Protection Programs," requires that DOE operations comply with environmental regulations and that the environmental programs must quantify pollutant releases, such as emissions, to support compliance decisions and understand the environmental effects of facility operations.

Secretary of Energy Notice (SEN)-29 requires that facilities monitor performance indicator trends, including air "effluent" releases (emissions).


Wyoming Air Quality Standards and Regulations (WYAQSR), Section 7, sets standards for allowable hydrogen sulfide (H$_2$S) concentrations in the ambient air. Section 21, "Permit requirements for construction, modification and operation," requires an application for construction of new facilities or modifications to existing facilities, or use of existing facilities, that will emit contaminants or increase emissions into the air of the state. Applications cannot be approved unless they show that the facility will not prevent attainment of any ambient standard.

Finding

NPOSRCUW does not have a complete source control and assessment program to quantify emissions and determine impacts and related compliance requirements.

Discussion

NPOSRCUW has no procedure or plan for ensuring that new or modified facilities, activities, emergencies, and emissions are evaluated for potential air impacts and that emission controls are designed which will comply with state and Federal requirements. There is no formal system to compile, quantify, control, and track source emissions generated by all the activities and sources at the site (see Finding A/CF-1).

Source emission increases have been addressed individually, and often without resolution. For example, a November 1990 Wyoming Department of Environmental Quality (WyDEQ) letter stated that a permit application should be submitted reflecting well vent emission increases from steam flood wells and that controls should be designed to meet best available control technology requirements (A-122). Records show that well vent analyses and H$_2$S emission information were submitted to the state in 1990 and 1991 (A-65, 121, 125, and 126), but the information provided was incomplete and relied on an inappropriate monitoring method to evaluate emission rates and quantities (A-125; I-A-6 and I-A-9). While there has been pilot testing of H$_2$S scavenger chemicals at tank batteries and test satellites (I-A-12), and JBEC has proposed to install flares (I-A-31), NPOSRCUW has not yet developed a plan to

Testing and investigation on H$_2$S sources and impacts has continued through at least late 1991 (A-124). This effort now appears to be intertwined with the recent H$_2$S health and environmental survey and control project (A-28, 29, 30, 31, 32, 35, 36, 37, 46, and 77). To date, NPSOR-CUW does not know the quantities of H$_2$S emitted from wells and tanks and has not conducted an adequate monitoring program or impact modeling to evaluate potential maximum impacts of the production enhancement project and whether it complies with Wyoming ambient standards for H$_2$S (I-A-10, 24, 32, and 34).

Some flares, vapor recovery systems, and other controls have been designed and purchased for projects (A-39, A-102, and A-103), but virtually none are in operation (I-A-28). Some are in storage and are being considered for reuse or in new applications (I-A-21 and I-A-31). These may require new design specifications under New Source Performance Standards or may require state permit applications when reactivated in ways that were not originally intended.

This finding was partially identified in the management section of the DOE/NPSOR-CUW self-assessment (April 1992), which contained no details on emission inventory or compliance needs. This finding was partially identified in the JBEC self-assessment (April 1992). JBEC did not address existing emission control techniques nor the need to incorporate emission estimates and review of control requirements for specified facilities and modifications into the early stages of project planning.

The apparent causal factors for this finding are inadequate policy implementation requiring source emissions monitoring/tracking and management programs; poor understanding of the risk of not controlling source emissions; and a lack of training. A secondary contributing factor for this finding is a lack of adequate appraisals/audits/reviews of projects and overall plans.

FINDING A/CF-5: Operating Procedures for Emission Control

Performance Objective

DOE 5400.1, "General Environmental Protection Program," states "it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards."

DOE 5400.19, "Conduct of Operations," Attachment I, Chapter II, requires that there be effective equipment monitoring to detect abnormal conditions. Chapter VIII requires that DOE equipment and systems be properly maintained and controlled. It also requires formal operating procedures and records to control site activities for consistent results in meeting objectives.

Wyoming Air Quality Standards and Regulations (WYAQSR), Section 14, "Control of particulate emissions," Subsection (b), requires that visible emissions from any source cannot be higher than 40 percent opacity. Subsection (f) requires that all persons must prevent fugitive dust emissions exceeding ambient air standards by using control techniques such as application of oil, water, or chemicals on roads.

Finding

Operating procedures at NPR-3 lack provisions to control emissions to ensure compliance with Wyoming air program requirements. In addition, there has been no formal system established for incorporating emission requirements into procedures or for operational recordkeeping that would support compliance determinations.

Discussion

General air program requirements in Wyoming and specific Wyoming Department of Environmental Quality (WDEQ) air permits issued for sources at NPR-3 include various requirements to reduce or limit emissions from NPR-3 (A-88, 91, 93, 104, 107 and 108) (see Finding A/CF-1). Personnel responsible for the operation of various types of potential air emission sources are often unaware of the activities that must be performed to comply with these requirements. The Environmental Subteam observed the following concerns:

Operators at the steam generators periodically monitor exhaust flue oxygen, but have not received guidance on how this relates to compliance with permit limits for NO$_x$ (I-A-5, I-A-7, and I-A-37).

While the gas burners used at the steam generators and heaters will rarely emit particulates (smoke), general plume opacity regulations apply to these sources and the LTS Gas Plant Flare. There are no procedures that direct operators to control and monitor combustion to ensure compliance with the opacity limit (I-A-5, I-A-6, and I-A-9).

No personnel have been formally designated as responsible for actions to limit air emissions, such as closing the parts degreaser lid and ensuring that thief hatches are closed, or for maintaining emission related records (I-A-7, I-A-9, and I-A-19).
Operating records, such as gas and oil analyses (A-52, A-62, and A-64) and steam generator logs (I-A-5 and I-A-37), are not in formats that support air emission inventory and permit compliance needs.

There is no formal program to ensure that problems causing excess emissions are corrected expeditiously or resolved in a manner that addresses environmental needs (I-A-16 and I-A-21) (see Finding A/CF-4).

There is no formal system for inspection and maintenance of emission sources and effluent control equipment, as required by DOE 5480.19. For example:

- A probe to monitor the oxygen content of steam generator exhaust had melted and was no longer sampling the appropriate area in the unrestricted exhaust stream (I-A-5).

- Formal procedures for maintaining the degreaser, vehicles and fuel pumps, LTS Gas Plant, and production tanks to minimize emissions have not been developed (I-A-19 and I-A-6).

- Equipment, such as the floating roof at the South Terminal, has been installed to limit emissions, but there is no program to check seals, gaskets, or valves for hydrocarbon leaks (I-A-4, I-A-6, and I-A-9). Oil was observed on top of the floating roof near the riser pipe opening (I-A-9).

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992). DOE did not identify the need for inspection and maintenance procedures or who would develop environmental criteria for operations. This finding was partially identified in the JBEC self-assessment (April 1992). JBEC did not clearly address existing sources and operating procedures.

The apparent causal factors for this finding are inadequate training to implement regulations, and incomplete procedures to effectively operate emission sources and air pollution control equipment.

FINDING A/CF-6: Gasoline Purchasing and Labeling

Performance Objective

40 CFR 80, "Regulation of Fuels and Fuel Additives," includes controls and prohibitions for wholesale purchaser-consumers of vehicle fuels with storage tanks of more than 550-gallon capacity.

40 CFR 80.27, "Controls and Prohibitions on Gasoline Volatility," requires that gasoline, dispensed in Wyoming during May through September by wholesale consumer-purchasers, have a Reid vapor pressure (RVP) of 9.0 pounds per square inch (psi) or less. When higher RVP ethanol blends are used, slightly higher volatility limits are allowed provided the ethanol content is documented and pumps are labeled properly.

Finding

NPOSR-CUW does not have a system in place to ensure compliance with the labeling and Reid vapor pressure provisions set forth in 40 CFR 80.

Discussion

Sites that dispense vehicle fuels must ensure compliance with EPA controls and prohibitions on vehicle fuels. Gasoline is dispensed at NPR-3 from tanks having a capacity greater than 550 gallons each; therefore, NPR-3 is classified as a wholesale purchaser-consumer subject to EPA fuel programs (A-139). There was no information available to document whether the RVP of the gasoline and ethanol blend used during the summer was under 9.0 psi (I-A-19).

The Purchasing Department was unaware of the EPA requirement limiting fuel volatility and had no documentation available concerning fuel specifications, in part because gasoline is purchased on a Department of Defense contract through a simple delivery order (I-A-27 and I-A-29).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) did not identify this finding.

The apparent causal factors for this finding are the absence of procedures to formalize a gasoline compliance program with designated review responsibilities, and the change in regulations and regulatory deadlines for compliance.
3.5.1.3 Best Management Practice Finding

FINDING A/BMPF-I: Management of Asbestos

Performance Objective

To ensure compliance with EPA regulations regarding demolition and renovation activities that might disturb asbestos fibers and requirements for the disposal of waste asbestos from these activities, best management practices suggest that formal procedures be in place and appropriately certified staff be available to manage asbestos abatement if and when it is discovered.

Finding

NPOSR-CUII has not developed or implemented an asbestos management program that would provide direction and procedures for removing, abating, or handling asbestos in a way that will prevent the release of asbestos to the environment.

Discussion

NPOSR-CUII has not established a formal asbestos management program. Roles and responsibilities for oversight of asbestos removal activities have not been formally defined, and no onsite personnel are certified to handle asbestos (I-A-15). There are no standard operating procedures to ensure that demolition and renovation activities meet the notification and work practice requirements of EPA’s National Emission Standards for Asbestos.

Occasionally asbestos-containing materials are found at NPR-3 (e.g., in transite thermal insulation behind a heater). Significant amounts are found at NOSR-1 and NOSR-3 (A-1, A-82, and A-83; I-A-4). Friable asbestos is found in pipe insulation and sheet rock in two of four buildings on the mine bench at NOSR-1 and in the water treatment plant at NOSR-3. Limited testing shows that non-friable asbestos-containing material was used in building siding, and an unknown amount of this material was disposed in a draw north of the Quonset Hut Warehouse at NOSR-3. The presence of these materials poses a continuing, potential risk of asbestos release to the environment. Historically, safety and health standards are used as guidance for asbestos handling at NPOSR-CUII, but there were no references to EPA requirements in recent contract specifications for work that might disturb asbestos at NOSR-3 (I-A-8 and I-A-15).

The DOE/NPOSR-CUII self-assessment (April 1992) and the JBEC self-assessment (April 1992) did not identify this finding.

The apparent causal factors for this finding are inadequate policy and procedures to establish a compliance program, and inadequate regulatory training for personnel. A secondary contributing factor for this finding is a lack of coordinated and comprehensive appraisals/audits/reviews of abatement project specifications among the Facilities Engineering, Environmental, and Health and Safety Departments.
3.5.2 Surface Water/Drinking Water

3.5.2.1 Overview

The surface water/drinking water portion of the Environmental Subteam assessment at NPOSR-CUW evaluated compliance with Federal, state, and local water pollution control requirements established for conformance with the Clean Water Act, as well as drinking water regulations promulgated as part of the Safe Drinking Water Act, and conformance with local sanitation, and local and state plumbing codes. In addition, the assessment evaluated compliance with DOE Orders, Secretary of Energy Notices (SEHs), and water pollution control practices in accordance with state and local requirements and industry-accepted best management practices. Table 3-4 lists the regulations and/or requirements used to assess surface water and drinking water compliance.

The scope of the surface water/drinking water assessment included document reviews, interviews with DOE/NPOSR-CUW and JBEC personnel, and inspection of facilities in both Colorado and Wyoming. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the surface water/drinking water assessment. Inspections in Colorado included the shale pile at NOSR-3, the potential direction for storm water runoff, and notation of the potential implications of storm water runoff. Observations were made of wastewater and groundwater sampling in and near West Sharrard Creek. Inspections in Wyoming included tanks and tank batteries, National Pollutant Discharge Elimination System (NPDES) outfalls, tank secondary containments, and spill control equipment. Reviews were made of the Spill Prevention Control and Countermeasure (SPCC) Plan, its implementing procedures, personnel spill control training records, calculation of secondary containment volumes, NPDES records, permit applications, Discharge Monitoring Report (DMR) submittals, and correspondence with state regulatory officials. Sampling for NPDES compliance was observed. The drinking water treatment and distribution system was inspected, documentation reviewed, and the potential need for treatment operator certification was assessed, as well as the need for installation of backflow prevention devices in the water distribution system. NPOSR-CUW manages 15 NPDES permits, issued by the State of Wyoming. The permits, available permit applications, the required sampling and analysis, and requisite data reporting were reviewed to determine compliance with regulatory requirements. As part of the surface water/drinking water portion of the assessment, interviews were coordinated with other Environmental Subteam specialists to ensure that all potential issues were addressed.

NPOSR-CUW purchases drinking water in bulk from the town of Midwest for use at NPR-3, adds sodium hypochlorite to the water on an "as determined needed basis" for additional purification, and softens the water by either passage through an ion exchange bed or through a reverse osmosis unit. The softened water is distributed through underground piping to buildings at NPR-3, as well as being supplied to various water coolers in the buildings in 5-gallon carboys filled at the outlet of the reverse osmosis unit.

NPOSR-CUW is awaiting response from state regulators in Wyoming (no permit is considered needed in Colorado) regarding how to proceed toward storm water permitting. The Wyoming Department of Environmental Quality (WYDEQ) is still in the process of determining how it will manage storm water permitting for...
TABLE 3-4

<table>
<thead>
<tr>
<th>Regulations/Requirements/Guidelines</th>
<th>Sections/Title</th>
<th>Authority</th>
</tr>
</thead>
<tbody>
<tr>
<td>WYDEQ Rules and Regulations, Chapter IV</td>
<td>Wyoming Oil and Hazardous Substances Spill Regulations</td>
<td>State of Wyoming</td>
</tr>
<tr>
<td>WYDEQ, WQ Division, Chapter V</td>
<td>Chapter V, Certification of Operators of Public Water and Public Wastewater Treatment Plants, Public Collection and Public Distribution Systems</td>
<td>State of Wyoming</td>
</tr>
<tr>
<td>WYDEQ, WQ Division, Chapter VII</td>
<td>Wyoming Effluent Guidelines and Standards for Oil and Gas</td>
<td>State of Wyoming</td>
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<tr>
<td>5 C.C.R. 1002-2</td>
<td>Colorado Discharge Permit System Regulations</td>
<td>State of Colorado</td>
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<tr>
<td>5 C.C.R. 1002-3 through 7</td>
<td>Colorado Water Quality Control Regulations</td>
<td>State of Colorado</td>
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<td>5 C.C.R. 1002-8</td>
<td>Colorado Water Quality Standards</td>
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<td>5 C.C.R. 1003-5</td>
<td>Colorado Primary Drinking Water Regulations</td>
<td>State of Colorado</td>
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<tr>
<td>25 C.R.S. Article 8</td>
<td>Colorado Water Quality Control Act</td>
<td>State of Colorado</td>
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The surface water/drinking water portion of the assessment identified seven compliance findings and one best management practice finding. No surface water/drinking water findings were identified regarding observations made during the Tiger Team’s visit to NOSR-1 and NOSR-3. Rather, information was provided to the quality assurance specialist for incorporation into a finding regarding the need for an Environmental Surveillance Plan and an Environmental Monitoring Plan at NOSR-1 and NOSR-3. The compliance findings address NPDES sampling; an unpermitted discharge; incorrect DMRs; secondary containment; the SPCC Plan, plan implementation, and secondary containment inadequacies; drinking water concerns regarding the need for the water treatment operator at NPR-3 to be state-certified; and the need for NPR-3 to install, maintain, and inspect backflow prevention devices on the potable water system. One best management practice finding addressed the need to prepare and implement a program to monitor for lead in the potable water system at NPR-3.

The approach understood to be currently favored is issuance of a general storm water discharge permit for the entire oil and gas industry in the state.

Fifteen NPDES permits have been issued to NPOSR-CWU by WYDEQ to manage wastewater discharges, primarily of produced water, from outfalls at NPR-3. Effluent limitations have been placed on the 15 discharges for oil and grease, specific conductivity, pH, and (in some cases) chemical oxygen demand. The majority of the discharges are intermittent, and only four outfalls are routinely sampled. One discharge is a mixture of produced water and subsurface water, the subsurface water being added to produce a discharge that will meet NPDES effluent limitations. DMRs for all permitted locations are required to be submitted to both WYDEQ and EPA Region VIII on a semi-annual basis. There are no NPDES permits for NOSR-1 and NOSR-3; however, a major concern at NOSR-3 is the possible collapse of the shale pile and its potential impact on waters of the United States.

Three Category IV findings were identified in the DOE 1988 Environmental Survey of NPOSR-CWU. These findings identified: (1) an NPDES DMR deficiency in which the number of NPDES samples taken at the site, the results of all analyses, and the number of exceedances were not being reported on the DMRs as required; (2) two minor unpermitted discharges identified during the survey at the LTS Gas Plant and at the condensate collection tank at Well 6B-26x26L; and (3) seepage observed adjacent to the B-1-28 pit. The second and third findings have been remediated and are considered closed; however, a review of the January through June 1991 DMRs for WY0028274 (B-Tp-10) indicated that 28 samples were taken and only 20 were reported on the DMR. Therefore, this finding is still an issue, and evidence of remedial action is not available.

Overall, assessment of the surface water/drinking water programs at NPOSR-CWU indicates the need for considerable effort to bring the programs into compliance. The apparent lack of procedures, coupled with the observed deficiencies in the SPCC Plan, underscore the need for the stated effort.

The approach understood to be currently favored is issuance of a general storm water discharge permit for the entire oil and gas industry in the state.
3.5.2.2 Compliance Findings

FINDING SW/CF-1: National Pollutant Discharge Elimination System (NPDES) Sampling

Performance Objective

40 CFR 122.1(b), "Scope of the NPDES permit requirement," requires National Pollutant Discharge Elimination System (NPDES) permits for the discharge of pollutants from any point source to waters of the United States. The State of Wyoming has been granted authority by the EPA to administer the NPDES program in the State of Wyoming.


JBEC Policy and Procedure No. 1.5-09, "NPDES Monitoring," Section B.1., states "Environmental Specialist or designee collects water samples in accordance with EPA sampling procedures . . . ."

Finding

Wastewater sampling at NPR-3 is not conducted in accordance with the State of Wyoming requirements (40 CFR 136); and JBEC Policy and Procedure No. 1.5-09.

Discussion

Fifteen NPDES discharge permits, issued by the State of Wyoming to DOE require DOE or its designee to sample, preserve, and analyze, or have analyzed in accordance with 40 CFR 136, its wastewater being discharged from the permitted point sources.

Neither the instrument calibration nor the sample collection observed by the Environmental Subteam were performed in accordance with 40 CFR 136. The Environmental Subteam observed the following: instrument electrodes for the measurement of pH and specific conductivity were not prerinsed with calibration liquids prior to calibration; calibration solutions were reused rather than being discarded after use; the same aliquot of sample was used for both pH and conductivity measurements; instrument calibrations were not verified after sample collection; and the sample collected for oil and grease was not collected from the surface of the outfall. Calibration of instruments and collection of samples in this manner will not consistently and accurately represent actual wastewater characteristics and may result in the reporting of inaccurate data.

This finding was partially identified in the DOE/NPDES-CMU self-assessment (April 1992) in that DOE identified the need for training, but did not address adequacy of procedures or lack of appraisals/audits/reviews. This finding was partially identified in the JBEC self-assessment (April 1992) in that JBEC identified the lack of a formalized sampling plan, but stated that sampling procedures have been written and "are performed in the field in a manner representative of the monitored activity." Sampling at two locations by two individuals was not performed in accordance with 40 CFR 136. Therefore, the lack of procedures and incorrect sampling indicate lack of addressing the finding.

The apparent causal factors for this finding are inadequate procedures to ensure that wastewater sampling is done in accordance with the requirements of 40 CFR 136, and insufficient training in proper wastewater sampling and analytical techniques. A secondary contributing factor is appraisals/audits/reviews in that these sampling and analytical deficiencies had not been previously identified.
FINDING SM/CF-2: Unpermitted Discharge

Performance Objective

40 CFR 122.41, "Conditions applicable to all permits," states "The following conditions apply to all NPDES (National Pollutant Discharge Elimination System) permits." (a) Duty to comply. The permittee must comply with all conditions of this permit. Any permit noncompliance with all conditions constitutes a violation of the Clean Water Act, and is grounds for enforcement action . . . ."

The State of Wyoming NPDES Permit Number WY0031895, Part II.A.1, states "Any anticipated facility expansions, production increases or process modifications which will result in new, different or increased discharges of pollutants must be reported by submission of a new NPDES application or, if such changes will not violate the effluent limitations specified in this permit, by notice to the permit issuing authority of such changes."

Finding

The quality of the wastewater discharge at outfall WY0031895, North Waterflood Plant at NPR-3 was changed in 1988 without notification or submission of a new NPDES application to the permit issuing authority, as required by NPDES Permit Number WY0031895 Part II.A.1.

Discussion

The State of Wyoming has been granted authorization by the EPA to administer the NPDES Program in the State of Wyoming. The Memorandum of Agreement covering this authorization is detailed in 40 CFR 123. Basic to this agreement is that the state requirements can be no less stringent than those required by the EPA.

According to available documentation (SW-68), water from the Madison formation was commingled with produced water from B-1-20 beginning in December 1988 in order to dilute the effluent at outfall WY0031895 to within permit effluent limitations. This dilution was not accompanied by a notification or new permit application to the Wyoming Department of Environmental Quality (WDEQ). There is evidence that WDEQ, if not aware of the modification, was in possession of documentation in which the modification was mentioned (SW-69).

The purpose of commingling the relatively clean Madison formation water with the produced water was to reduce the specific conductivity (by reducing the total dissolved solids content) of the effluent to within effluent limitations. This dilution constitutes treatment, which is not specified in the permit.

This finding was partially identified in the DOE/NPORS-CUW self-assessment (April 1992) in that DOE identified the need for training in their self-assessment but did not identify the lack of written procedures or the absence of policy regarding the need to verify environmental compliance prior to attempting modifications to permitted outfalls. This finding was partially identified in the JBEC self-assessment (April 1992) in that JBEC identified that sampling personnel do not have formal operating procedures, and that training has been inadequate and informal regarding regulatory requirements.

However, JBEC did not identify inadequate supervision for implementing regulations and permit requirements nor did JBEC identify the lack of policy regarding the need to verify environmental compliance prior to attempting modification to permitted outfalls.

The apparent causal factors for this finding are a lack of training in applicable Federal and state regulations regarding NPDES requirements; lack of written procedures to effectively implement regulations; nonexistent policy regarding the need to verify environmental compliance prior to attempting modification to permitted outfalls; and inadequate supervision for implementing regulations and permit requirements.
FINDING SM/CF-3: Discharge Monitoring Reports

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," Chapter I.B., states that a high-level of performance in DOE operations is accomplished by establishment of high operating standards by management; communicating operating standards to the working level; ensuring that personnel are well trained; and closely monitoring performance in operations.

40 CFR 122.22, "Signatories to... reports," Subsection B, states that all reports required by permits must be signed by a senior executive officer having responsibility for the overall operations of a principal geographic unit, or by a duly authorized representative of that person. 40 CFR 122.22 also identifies the need for a responsible person to sign, certify, and oversee proper distribution of these monitoring reports, which have stringent penalties for careless, inaccurate, or improper use.

40 CFR 122.41, "Condition applicable to all permits," Subsection K, states "All applications, reports, or information submitted to the Director [of EPA] shall be signed and certified."

Parts I.B.2, "Authorization to Discharge Under the National Pollutant Discharge Elimination System," of NPDES Permits WY0031895, WY0034037, WY0032115, WY0034584, WY0035076, WY0034495, WY0030274, WY0028932, WY0028924, WY0028916, WY003484, WY0028894, and WY0028908 state that "Duplicate signed copies of... reports required herein shall be submitted to the Regional Administrator and the State..."

Part I.B.2 also states "Monitoring results... shall be... postmarked no later than the 28th day of the month following the completed reporting period."

Finding

Discharge Monitoring Reports for NPR-3 for the January - June 1991 and July - December 1991 reporting periods were not submitted in accordance with the requirements of 40 CFR 122, the NPDES permits, and DOE 5480.19.

Discussion

A certified letter was sent to NPOS-CUW by the Wyoming Department of Environmental Quality (WYDEQ) stating the WYDEQ had noted the lack of signatures and the missdirected copies of the Discharge Monitoring Reports for January 1991 - June 1991. In the letter, the WYDEQ directed the NPOS-CUW to properly complete and submit reports in the future (SW-64). The cover letters for the two reporting periods in question were signed by someone other than the Director of NPOS-CUW, who has responsibility for the overall operations of NPR-3, indicating that the Director may have been unavailable to sign and date the reports (SW-65 and SW-66).

DOE/NPOS-CUW has not submitted written notice to WYDEQ naming an authorized designee to sign the Discharge Monitoring Reports (DMR) in the absence of the Director (I-SW-7). The July 1991 - December 1991 Discharge Monitoring Reports were signed by an unauthorized signatory.

The cover letter for the July - December reports is dated January 29, 1992, indicating that the submission was not timely (SW-65).

This finding was partially identified in the DOE/NPOS-CUW self-assessment (April 1992). DOE did not identify the requirements regarding certification and signatories as stated in 40 CFR 122.22.

The apparent causal factors for this finding are a lack of policy implementation of Federal and state regulations regarding the preparation and submission of regulatory reports, and a lack of procedures to submit DMRs in accordance with the regulations, DOE Orders, and permits.
FINDING SW/CF-4:  Secondary Containment

Performance Objective

40 CFR 112.3, "Requirements for preparation and implementation of Spill Prevention Control and Countermeasure Plans," Subsection A, states that owners and operators of onshore facilities that could reasonably be expected to discharge oil in harmful quantities into or upon the navigable waters of the United States shall prepare a Spill Prevention Control and Countermeasure (SPCC) Plan in accordance with 40 CFR 112.7.

40 CFR 112.7, "Guidelines for the preparation and implementation of a Spill Prevention Control and Countermeasure Plan," requires the use of appropriate containment or diversionary structures to prevent discharged oil from reaching a navigable water course.

40 CFR 112.7(e)(2)(ii) requires that bulk storage tank installations "be constructed so that a secondary means of containment is provided for the entire contents of the largest single tank plus sufficient freeboard to allow for precipitation."

Finding

The secondary containment volumes for some of the bulk storage tanks at NPR-3 do not meet the requirements of 40 CFR 112.7(e)(2)(ii).

Discussion

The NPOS-CW SPCC Plan, September 1991, Section 8.3, states "Bulk storage tanks are surrounded with secondary containment dikes to prevent a spill event. These dikes are sized and constructed with sufficient capacity to contain at least 110 percent of the fluid from the largest tank." Calculation of secondary containment volumes, performed in August 1991, for 18 of the 38 bulk storage tanks listed in the SPCC Plan indicated that 9 of the 18 containment volumes are less than 100 percent of the capacity of the largest contained tank (SW-66; I-SM-11). One additional secondary containment volume was calculated to contain 106 percent of the contained tank volume.

An inspection of six secondary containment structures for tanks at NPR-3 revealed stairs that were provided, and in one case, vehicular traffic was observed. Thus, secondary containment volumes for these tanks are likely to be less than previously calculated.

This finding was not identified in the DOE/NPOS-CW self-assessment (April 1992) and was fully identified in the JBECE self-assessment (April 1992).

The apparent causal factors for this finding are inadequate design of secondary containment; a lack of implementing procedures for performing and documenting routine inspection and preventive maintenance of containment structures; inadequate training of employees; and inadequate supervision for implementing regulations and permit requirements.

FINDING SW/CF-5:  Spill Prevention Control and Countermeasure Plan

Performance Objective

40 CFR 112.3, "Requirements for preparation and implementation of Spill Prevention Control and Countermeasure Plans," states that owners and operators of onshore facilities that could reasonably be expected to discharge oil in harmful quantities into or upon the navigable waters of the United States shall prepare and implement a Spill Prevention Control and Countermeasure (SPCC) Plan.

40 CFR 112.7, "Guidelines for the preparation and implementation of a Spill Prevention Control and Countermeasure Plan," provides guidelines for the preparation and implementation of the SPCC Plan.

Finding

The SPCC Plan prepared for NPOS-CW, dated September 1991, does not meet the requirements of 40 CFR 112.7, nor does it reflect actual operating conditions.

Discussion

40 CFR 112.3 states that each prepared SPCC Plan must be "fully implemented." Implementation includes written, operating, and documented procedures for the routine inspection and maintenance of tanks and associated piping; construction, maintenance, and inspection of appropriate spill containment; adequate and accessible spill control equipment; and spill control training which ensures that a facility is operated in a manner that complies with all Federal, state, and local spill control regulations. A copy of the SPCC Plan must be maintained at each operating facility if the facility is normally attended at least 8 hours per day.

40 CFR 112.7 states "the complete SPCC Plan shall follow the sequence outlined (in 112.7), and include a discussion of the facility's conformance with the appropriate guidelines (stated in 112.7)."

Items noted during review of the SPCC Plan and inspections of NPR-3, NOSR-1, and NOSR-3, which do not meet the requirements of 40 CFR 112.7, include:

The SPCC Plan available at NOSR-3 is not current (I-SW-8) (40 CFR 112.3(e)).

The SPCC Plan does not accurately reflect secondary containment volumes (see Finding SW/CF-4).

Spill control equipment (listed in Section 6.2.1 of the NPOS-CW September 1991 SPCC Plan) is stored at NPR-3 at the Environment, Safety, and Health (ESH) Building and in a "spill box" located in Section 21 at a point near the confluence of Little Teapot Creek and Teapot Creek. The equipment in both locations is in disarray; material is inconvenient to access (equipment stored near the ESH building is located in two large bins which would require personnel to climb inside to access stored items); and not all listed items were available (for example, rope was not available...
at the ES&H Building, and no shovels were observed at either location).

There are no procedures to regularly test liquid-level sensing devices to ensure proper operation (40 CFR 112.7(e)(2)(viii)(E)).

Spill prevention training records are not sufficiently annotated to permit verification that SPCC Plan requirements are being met. No course outline or syllabus was available for review (1-SM-12) (40 CFR 112.7(e)(10)).

There are no procedures to subject aboveground tanks to periodic testing (40 CFR 112.7(e)(2)(vi)).

There are no written procedures to ensure that liquid collected in secondary containment meets applicable water quality standards prior to release, and that records of the inspection, testing, and release are maintained (40 CFR 112.7(e)(2)(iii)(A-D)).

There are no written procedures to verify that all aboveground valves and pipelines are subjected to regular examination by operating personnel (40 CFR 112.7(e)(3)(iv)).

The procedure for tank truck loading and unloading does not address the requirements stated in 40 CFR 112.7(e)(4)(ii) and (iii), which include a containment volume available to contain the entire truck contents, and a signal system or physical barrier system to prevent truck departure before uncoupling and securing the fill hoses.

The SPCC Plan does not address dikes and drainage constructed for containment of PCB fluids (40 CFR 761.65(c)(7)(i)).

This finding was not identified in the OOE/NPOSR-CUW self-assessment (April 1992) and was fully identified in the JBEC self-assessment (April 1992).

The apparent causal factors for this finding are inadequate knowledge of the requirements for the preparation of an SPCC Plan by personnel, and ineffective supervision controls for implementing policies, plans, and regulations. A secondary contributing factor for this finding is ineffective appraisals/audits/reviews prior to issuance of the plan.

FINDING SW/CF-6: Water Treatment System Operator Certification

Performance Objective

Wyoming Statutes, Title 35, Chapter II, Section 302 (W.S. 35-11-302) states that no person shall operate a public water treatment plant or public distribution system in violation of the requirements contained in Chapter V, Rules and Regulations, Department of Environmental Quality, Water Quality Division, State of Wyoming.

The Wyoming Department of Environmental Quality Rules and Regulations, Water Quality Division (WDEQ/WQD), Chapter V, states that the individual responsible for treatment system operation must hold certification at the same level as the classification of the system for which he is responsible.

Section 6 of Chapter V, "Criteria for classification of plants and systems," includes the criteria for evaluation of potable water treatment systems.

Finding

The operator of the water treatment system at NPR-3 does not hold the proper level certificate.

Discussion

NPR-3 buys potable water from the town of Midwest, Wyoming. The NPR-3 system serves less than 7,500 persons, and the water is treated at NPR-3 with disinfectant and through reverse osmosis. Based on the classification criteria in WDEQ/WQD, Chapter V, Section 6(a), the NPR-3 water treatment system is Class IV; therefore, the operator is required to hold a Class IV certificate. The water treatment system operator does not hold proper certification under Chapter V to operate the treatment plant at NPR-3.

The DOE/NPOSR-CUW self-assessment (April 1992) and JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factors for this finding are that JBEC has not provided proper training for the system operator to ensure that state regulatory requirements are satisfied, and lack of quality assurance/quality control on the part of DOE in permitting a previously identified situation to continue without remediation.
FINDING SW/CF-7: Backflow Prevention Devices

Performance Objective

The Plumbing Code for the State of Wyoming, Uniform Plumbing Code, Chapter 10, Section 1002(c), states "No plumbing fixture, device or construction shall be installed or connected to any domestic water supply, when such installation or connection may provide a possibility of polluting such water supply or may provide a cross-connection between a distributing system of water for drinking and domestic purposes and water which may become contaminated by such plumbing fixture, device, or construction unless there is provided a backflow prevention device approved for the potential hazard."

Section 1003 of the Plumbing Code states "All devices installed in a potable water supply for protection against backflow shall be maintained in good working condition by the person or persons having control of such devices."

DOE 4330.4A, "Maintenance Management Program," states "The maintenance management program for all DOE facilities be consistent with (DOE 4330.4A) and that property is maintained in a manner which promotes operational safety, worker health, environmental protection and compliance . . . ." "Structures components, and systems (active and passive) that are important to safe operation of a property or facility shall be subject to a maintenance program to ensure that they meet or exceed their design requirements throughout the life of the . . . facility." "Periodic examination of . . . systems . . . and equipment be performed to determine deterioration or technical obsolescence which threaten performance and/or safety."

DOE 6430.1A, "General Design Criteria," Section 0266-2, states that the quality of domestic water within distribution systems serving DOE facilities shall be protected from degradation by installation of backflow prevention devices, and that domestic water shall comply with all state, regional, and local requirements. New, modified, or newly acquired systems are to be in compliance with this Order.

Finding

NPOSRC-UW has not established a program to ensure that backflow prevention devices are installed, tested, and maintained where needed throughout NPR-3.

Discussion

Backflow prevention devices are required by the Uniform Plumbing Code at points or potential points of cross-connections to ensure the purity of the potable water system. Within a facility, whenever potable water is used in an industrial process, including water hoses laying in sinks or drains (as observed in the NPR-3 office building men's room), the connection of the industrial process to the water distribution system is considered a "cross-connection." The water distribution system in these cases must be protected by approved backflow protection devices, which could include an air gap, vacuum breaker, or check valve. When mechanical backflow prevention devices are utilized to protect against cross-connections, they must be properly maintained, and periodically inspected to ensure proper operation.

NPR-3 has no program in place to isolate its potable water system from sources of potential contamination (I-SW-13).

The DOE/NPOSRC-UW self-assessment (April 1992) and the JEC self-assessment (April 1992) did not identify this finding.

The apparent causal factors for this finding are the inadequate knowledge and work experience of personnel in this area, coupled with a lack of proper training in applicable federal, state, and local laws and regulations.
3.5.2.3 Best Management Practice Finding

FINDING SW/BMFP-1: Lead Testing of the NPR-3 Potable Water

Performance Objective

Best management practices suggest monitoring potable water systems for lead at facilities whose water distribution systems were constructed using lead-based products.

Finding

NPOS-R-CUW does not have a formal program to monitor for lead in its potable water supply system at NPR-3.

Discussion

The use of solder, containing 50 percent lead, to join copper pipe and tubing in potable water systems was prohibited in June 1986 by the EPA. The potable water supply system at NPR-3, installed in the 1970s, used copper supply lines joined by using lead-containing solder (SW-61 and SW-62; I-SW-13).

DOE/NPOS-R-CUW recognized the potential for lead to be present in the drinking water at NPR-3 and requested the management and operation contractor at the time, Lawrence-Allison & Associates West, to conduct sampling and analysis for the presence of lead (SW-62). Two samples were collected in 1987, one from the potable water transport truck and one from a building water tap. Analyses performed by a subcontractor detected no lead at or above the maximum permitted concentration level of 0.05 mg/L. No NPR-3 potable water samples have been tested for lead since that initial event, and there is no formal program to monitor for lead.

According to EPA guidelines, a lead monitoring program is not necessary if lead solder has not been used in the past 10 years. There are no records at NPR-3 to document when the use of lead solder was discontinued.

The DOE/NPOS-R-CUW self-assessment (April 1992) and the JBEF self-assessment (April 1992) did not identify this finding.

The apparent causal factor for this finding is a lack of policy to sample for lead in potable water.
3.5.3 Groundwater/Soils, Sediments, and Biota

3.5.3.1 Overview

The purpose of the groundwater/soils, sediments, and biota portion of the Environmental Subteam assessment of NPOS-CUW was to: (1) evaluate the programmatic and technical status of protection and monitoring programs for groundwater, soils, sediments, and biota; (2) evaluate the potential for, and actual contamination of, these media by radiological and nonradiological constituents as a result of past and present operations; and (3) evaluate programs and procedures established to prevent future contamination and to prevent the spread of existing contamination. The programs and field activities were evaluated against the criteria established in DOE Orders; Federal, state, and local regulations and guidance; industry guidance; and best management practices listed in Table 3-5.

The scope of the groundwater/soils, sediments, and biota assessment included document reviews, interviews with DOE/NPOS-CUW and JBEC personnel, and inspection of facilities in both Colorado and Wyoming. Because there has been no development of resources at NPOS-2 in Utah, that site was not included in the groundwater/soils, sediments, and biota assessment. Documents reviewed included reports, departmental abstracts, memoranda, regulatory documentation, and an interagency agreement. Additional information was obtained through consultation with inactive waste sites, surface water, waste management, radiation, and quality assurance specialists on the Environmental Subteam. Onsite inspections were conducted to examine groundwater monitoring wells, identify potential sources of groundwater contamination, and verify documented information reviewed during the assessment. Sample collection, equipment calibration, documentation, and recordkeeping were observed during a routine groundwater sampling event.

This overview is divided into three sections: the groundwater environment; the soils, sediments, and biota environment; and a summary of the findings.

Groundwater

Ongoing operations at NPOS-CUW have the potential to impact groundwater. Potential contaminant sources include historical and current industrial and sanitary wastewater discharges, reserve and produced water pits, underground storage tanks, the landfill and land farm, well pads, tank batteries, and the shale pile. The principal types of potential contaminants are petroleum hydrocarbons and those resulting from site operations and associated exploration and production wastes.

NPR-3 is located approximately 35 miles north of Casper, Wyoming. NPR-3 is located over the crestal axis of an asymmetrical doubly-plunging anticline in the Teapot Dome Oilfield. NPR-3 contains 9,481 acres located on a 7 miles north-south and 2 miles east-west axis. The primary NPR-3 mission is to produce oil at the maximum efficient rate (MER). As a result of MER commitments, 1,189 wells, 10 production batteries, and 28 test satellites have been constructed as of July 2, 1992.

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<thead>
<tr>
<th>Regulations/Requirements/Guidelines</th>
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<th>Authority</th>
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<td>DOE 5400.1 General Environmental Protection Program</td>
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<td>DOE 5400.4 Comprehensive Environmental Response, Compensation, and Liability Act Requirements</td>
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<td>40 CFR 264 and 265 Standards and Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities</td>
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<td>OSWER Directive 9283.1-2 Guidance on Remedial Actions for Contaminated Groundwater at Superfund Sites</td>
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<td>OSWER Directive 9502.00-60 RCRA Facility Investigation (RFI) Guidance</td>
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<td>SW-846 Test Methods for Evaluation of Solid Waste/Physical Chemical Methods</td>
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<tr>
<td>Chapter I Solid Waste Management Rules, General Provisions</td>
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TABLE 3-5
LIST OF GROUNDWATER/SOILS, SEDIMENTS, AND BIOTA
REGULATIONS/REQUIREMENTS/GUIDELINES

<table>
<thead>
<tr>
<th>Regulations/Requirements/Guidelines</th>
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<td></td>
<td>Industrial Landfill Regulations</td>
<td></td>
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<tr>
<td>Chapter VIII</td>
<td>Solid Waste Management Rules, Special</td>
<td>WYDEQ</td>
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<td>Waste Management Standards</td>
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<td>Chapter XI</td>
<td>Water Quality Rules and Regulations</td>
<td>WYDEQ</td>
</tr>
<tr>
<td>Rules 10, 11, and 12</td>
<td>Water Well Construction and Pump</td>
<td>Colorado Office of the State Engineer</td>
</tr>
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<td></td>
<td>Installation Rules</td>
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</table>

The hydrogeologic setting at NPR-3 consists of two groundwater regimes: shallow perched alluvial aquifers located in draws and arroyos and the deeper aquifers. The perched aquifers are located beneath Little Teapot Creek and its tributaries and have resulted from discharged waters at the B-Tp-10 and the North Waterflood continuous discharge points. Two formations, Tensleep and Madison, produce Class III water suitable for livestock consumption. The Madison aquifer lies below the deepest oil producing formation at an approximate depth of 6,000 feet. The high thermal gradient at NPR-3 results in water temperatures of approximately 180°F. The Madison aquifer can be a high yielding fresh water aquifer and is utilized for the North Waterflood project. Tensleep water is used for drilling and steam generation. No significant upper or intermediate aquifers, of Class III or better quality, have been detected during the drilling of oil wells at NPR-3. The upper and intermediate aquifers produce saline, nonpotable water or a mixture of hydrocarbons and water.

Groundwater monitoring wells at NPR-3 were installed as a result of Wyoming Department of Environmental Quality regulatory requirements for landfills. There are five groundwater monitoring wells at the landfill. Three of the five wells were constructed by air drilling, which is not an approved drilling method for environmental investigations. Groundwater monitoring at NPR-3 is conducted by UBEC Environmental Department staff. The groundwater monitoring wells are sampled to determine if contamination is impacting the perched aquifer at the landfill operations. At present, environmental sampling has not been conducted to determine whether NPR-3 operations have impacted the Madison or other aquifers.

NOSR-1 and NOSR-3 are located approximately 8 miles west of Rifle, Colorado. NOSR-1 has a mean elevation of approximately 9,000 feet above sea level. NOSR-3 has elevations ranging from approximately 6,000 feet above sea level at the southern boundary, to 9,300 feet above sea level at the northern boundary. NOSR-1 and NOSR-3 occupy 40,760 and 14,130 acres, respectively.

The hydrogeologic setting for NOSR-1 consists of four groundwater regimes, with complex recharge and discharge regimes, extensive geologic faulting, and highly variable stratigraphy. Groundwater is available from four aquifers. Test shale oil assay core holes, previously used to determine if industrial quantities of groundwater were available for oil shale development, were retrofitted with monitoring wells. Groundwater monitoring at NOSR-1 has not been conducted since 1981.

The primary NOSR-3 mission is to protect DOE's natural gas resources by preventing other operators from draining NOSR-3 natural gas. Thirty-five natural gas wells were operating on NOSR-3 as of 1992. NOSR-1 remains inactive since production of oil from shales is not economically viable at present.

The hydrogeologic setting of NOSR-3 consists of two groundwater regimes: shallow perched alluvial aquifers located in draws and arroyos and a reliable groundwater source in the Mesaverde Formation. An approximately 400,000-ton shale pile abuts West Sharrard Creek, which is a tributary to the Colorado River. A perched alluvial aquifer is located beneath West Sharrard Creek.
Groundwater monitoring at NOSR-3 is conducted by the Environmental Department of JBEC. The existing groundwater monitoring well network at NOSR-3, consisting of 19 perched alluvial groundwater monitoring wells, was developed as a result of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation of the shale pile. Information is available to document that NOSR-3 operations have impacted the perched alluvial aquifer.

Soils, Sediments, and Biota

NPR-3 is part of a vast grassland biome located in a semi-arid vegetative zone occurring at approximately 5,200 feet above sea level. The vegetation is mainly shortgrass and big sagebrush. However, the area exhibits signs of past alteration, including sagebrush control and invasion of non-native plants.

NPR-3 supports large game consisting primarily of mule deer and North American pronghorn. There are numerous other mammals including mountain lions, coyotes, raccoons, striped skunks, badgers, foxes, prairie dogs, rabbits, and deer mice. Reptiles and amphibians include salamanders, lizards, non-poisonous snakes, and prairie rattlesnakes. There are many species of birds at NPR-3 including prairie falcons, golden eagles, red-tailed hawks, pronghorn. There are approximately 65 species of birds identified, including the peregrine falcon, an endangered species. The Colorado River, which is adjacent to NOSR-3, supports a variety of aquatic wildlife.

Soil and sediment sampling and monitoring are not performed. NPOS-R-CW does not issue soils, sediments, or biota monitoring or surveillance reports for NOSR-1 and NOSR-3. No onsite or offsite terrestrial wildlife or vegetation are sampled.

The 1988 Environmental Survey identified one category III issue at the Anvil Points Oil Shale Experiment Station: groundwater and soil contamination from the NOSR-3 shale pile. Groundwater monitoring wells and lysimeters have been installed to sample and analyze groundwater in proximity to the shale pile. Concentrations of contaminants are steadily declining in the groundwater monitoring wells. JBEC has not scheduled remedial activities for the shale pile.

The overall assessment is that NPOS-R-CW’s monitoring activities for groundwater have been informal, inconsistently implemented, and insufficient to fully determine the impacts of DOE operations on the environment. Additionally, there are no formal monitoring programs for soils, sediments, and biota. The activities have been implemented by a small number of technical personnel, without significant oversight from DOE/NPOS-R-CW or JBEC management. The JBEC personnel responsible for environmental program implementation do not have the requisite environmental technical knowledge and expertise in these areas.

The groundwater/soils, sediments, and biota assessment identified seven compliance findings. The findings were related to the groundwater protection management program, hydrogeologic monitoring well networks, groundwater sampling designs, closure and protection of wells and boreholes, oil well abandonment management and surveillance, unauthorized use of disposal wells, and contaminated soil management.
3.5.3.2  Compliance Findings

FINDING GM/CF-1:  Groundwater Protection Management Program Plan

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter III, Section 4.a, requires that a Groundwater Protection Management Program Plan (GPMPP) be completed by May 1990.

Finding

NPOSr-CUW has not prepared a Groundwater Protection Management Program Plan (GPMPP) in accordance with DOE 5400.1.

Discussion

A GPMPP has not been prepared for NPOSr-CUW as required by DOE 5400.1.

The DOE/NPOSr-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factor for this finding is policy implementation in that DOE/NPOSr-CUW and JBEC have not implemented the GPMPP requirement of DOE 5400.1.

FINDING GM/CF-2:  Sitewide Hydrogeological Monitoring Well Network

Performance Objective

DOE 5400.1, Chapter IV, Section 9, specifies "Groundwater that is or could be affected by DOE activities shall be monitored to determine and document the effects of operations on groundwater quality and quantity to demonstrate compliance with DOE requirements and applicable Federal, state, and local laws and regulations." This was to have been implemented by November 9, 1991.

Chapter I, Section 4, "Exemption Procedures," states "Requests for exemptions from applicable environmental protection standards are not encouraged. However, in limited cases, programmatic circumstances or operational conditions may warrant such requests in accord with the following procedures." Subsection 4.b includes procedures to be followed to obtain exemptions.

Finding

NPOSr-CUW has neither installed sitewide hydrogeological monitoring well networks for NPR-3, NOSR-1, and NOSR-3 that are sufficient to characterize the impact of DOE operations on groundwater quality, as required by DOE 5400.1, nor have they applied for an exemption from these requirements.

Discussion

NPOSr-CUW has not installed a sitewide hydrogeological monitoring well network for NPR-3 and NOSR-1. The existing groundwater monitoring well network at NPR-3 was developed as a result of Wyoming Department of Environmental Quality regulatory requirements for solid waste disposal landfills and does not fulfill the requirements of DOE 5400.1. The existing groundwater monitoring well network at NOSR-3 was developed as a result of a Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) investigation of the retorted shale pile and also does not fulfill the requirements of DOE 5400.1.

In addition to the issues noted above, the Environmental Subteam observed the following concerns with the NPR-3 and NOSR-3 hydrogeological monitoring well network programs:

The surface and subsurface geology, stratigraphy, and hydrostratigraphy have not been defined and described, including regional setting and site-specific conditions. The descriptions do not include identification of aquifers, surface water/groundwater relationships, and local water-use factors (I·GW-47).

The direction of groundwater flow has not been defined for each aquifer or hydrostratigraphic unit. Contour maps showing the configuration of the piezometric surface of each unit are not available (I·GW-47).

The vertical gradients between aquifers and intervening confining units to define geology and structure between aquifers have not been determined (I·GW-47).
Hydrogeologic characteristics such as hydraulic conductivity, transmissivity, saturated thickness, and effective porosity have not been measured. This information will determine groundwater flow direction and recharging capacity of the aquifers to support sitewide characterization required by DOE 5400.1 (I-GW-47).

The monitoring well networks do not have sufficient stations to determine the quality of the groundwater entering and leaving the site. Thus, comparisons between upgradient and downgradient conditions in all defined hydrostratigraphic units to detect and evaluate potential offsite releases of contaminants is not possible (I-GW-47).

The monitoring well network described in the NOSR-L Hydrology Data Book, Volumes I-IV, was developed for a groundwater feasibility study to determine if industrial quantities of groundwater were available for oil shale development. These groundwater monitoring wells were not designed to address sitewide issues and are not adequate to characterize the complex hydrogeological conditions of the NOSR-L geology. The following deficiencies in the NOSR-L sitewide hydrogeological monitoring well network were identified by the Environmental Subteam:

- The monitoring wells were constructed utilizing oil field technology. Pipe dope, which could affect groundwater monitoring analytical results, was observed on pipe thread protectors in the nested monitoring wells (I-GW-4 and I-GW-48).

- There are no contour maps showing configuration of the piezometric surface of each aquifer and hydrostatic unit to define groundwater flow direction to support sitewide characterization required by DOE 5400.1 (I-GW-48).

- No documentation of plugging and abandonment of United States Bureau of Mines (USBM) coreholes is available (I-GW-8).

- Three noncontiguous NOSR-L parcels of land have no groundwater monitoring wells to define groundwater conditions to support sitewide characterization required by DOE 5400.1 (I-GW-48).

The DOE/NOSR-CUII self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factor for this finding is policy implementation. NOSR-CUII has not adequately implemented the DOE 5400.1 policy to establish a sitewide hydrogeological monitoring well network, nor applied for an exemption.

FINDING GM-CF-3: Groundwater Sampling Procedures

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, "Environmental Monitoring Requirements," requires that a quality assurance program (QAP) consistent with DOE 5700.6B (superseded by DOE 5700.6C), "Quality Assurance," be implemented by November 9, 1991. Specifically, the QAP must include field quality control and chain-of-custody procedures.

DOE 5400.1, Chapter III, Section 4.a, "Groundwater Protection Management Program (Plan)," lists comprehensive requirements for groundwater monitoring. The plan was required to be completed by November 9, 1991.

DOE 5400.1 lists SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, and EPA-600/4-79-019, Handbook for Analytical Quality Control in Water and Wastewater Laboratories, as selected references for environmental monitoring.

EPA-600/4-79-019, Chapter 12, states that samples must be accompanied by a chain-of-custody record that includes the name of the study, collectors' signatures, station number, station location, date, time, type of sample, sequence number, number of container, and analyses required.

SW-846 states that an essential part of any sampling/analytical scheme is ensuring the integrity of the sample from the time of collection to data reporting. The possession and handling of samples should be traceable from the time of collection through analysis and final disposition.

Office of Solid Waste and Emergency Response (OSWER) 9950.1, "Groundwater Monitoring Technical Enforcement Guidance Document," discusses specific procedures for sample collection, including Section 4.2.4, "Sample Withdrawal"; Section 4.3.3, "Special Handling Requirements"; and Section 4.4, "Chain-of-Custody."

Finding

NOSR-CUII groundwater sampling activities are not consistent with the DOE 5400.1 requirements for QAPs and OSWER 9950.1.

Discussion

DOE 5400.1 requires that a QAP must be implemented that includes field quality control and chain-of-custody procedures. Sampling and chain-of-custody guidelines specific to groundwater monitoring are outlined in OSWER 9950.1. JBEC personnel indicated that no site-specific groundwater sampling procedures have been written to implement DOE 5400.1 and the OSWER guidelines (I-GW-5).

The Environmental Subteam observed one demonstration groundwater sampling event (June 17, 1992). During the sampling event, the following deficiencies were observed:

Preparation for pH measurement included "wetting" the probe with the protective cap in place. This would not allow the probe to be in contact with the sample (I-SW-5) (see Finding QA/CF-4).
Well No. OR-5, a low yield well, was not purged prior to sampling. Low yield wells, while they present unique purging problems, should be purged prior to sampling to ensure that a representative groundwater sample is taken.

A calculation of groundwater well volume, which is necessary to determine well-specific purging and sampling requirements, was not performed.

Bailed water was simply poured on the ground, rather than collected. Groundwater may contain hazardous constituents and must be collected, analyzed, and properly disposed.

Only one field measurement of pH, temperature, and conductivity was made at the time of the sample collection. Typically, these field measurements are taken at a minimum of the first, second, and third well bore purge volumes in order to ensure that groundwater has flowed into the well bore (I-GW-5).

JBEC does not have formal equipment decontamination procedures to prevent sample contamination (I-GW-5).

Sampling personnel did not wear clean gloves during well evacuation and sampling, which is a suggested practice of the Technical Enforcement Guidance Document and helps to ensure sample integrity.

The electronic water level probe was decontaminated only with deionized water and a paper towel, which does not meet the recommendations of OSWER 9950.1.

Groundwater samples collected for dissolved metal analysis were not filtered prior to being preserved, which results in a total metals value rather than a dissolved metals value.

Volatile organic samples were not collected first, and when collected, they were transferred to the sample vials in such a manner that air bubbles were trapped in the vial (I-GW-5).

According to OSWER 9950.1, volatile organic samples should be collected prior to other samples. Sample vials with air bubbles will not provide an accurate analytical concentration of volatile organics.

Chain-of-custody procedures did not contain the following elements:
- Sample labels did not indicate the type of analytical parameters to be tested from each bottle;
- Sample seals were not used to ensure integrity; and
- No chain-of-custody record was available to track sample possession (I-QA-23) (see Finding QA/CF-11).

Training is not provided to sampling technicians to ensure that proper sampling techniques are used to collect samples (see Finding QA/CF-5).

This finding was partially identified in the DOE/NPSN-CUM self-assessment (April 1992) and was partially identified in the JBEC self-assessment (April 1992). Neither of the self-assessments identified all of the deficiencies observed by the Environmental Subteam.

The apparent causal factors for this finding are procedures, training, and supervision. The sampling team did not adhere to OSWER guidance for sample collection, and there was no formal procedure to train sampling technicians. No direction has come from management to implement an aggressive sampling training program. A secondary contributing factor is a lack of appraisals/audits/reviews to ensure compliance with current sampling requirements.
FINDING GM/CF-4: Closure and Protection of Wells and Boreholes

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Section 5.a, "Policy," requires that DOE "minimize risks to the environment or public health, and anticipate and address potential environmental problems before they pose a threat to the quality of the environment or public welfare."

Revised and Amended Rules and Regulations of the Colorado Office of the State Engineer Board of Examiners of Water Well Construction and Pump Installation Contractors, Rule 10, requires that all wells, when unattended, be securely sealed, capped, or covered. Rule 11 requires that abandoned wells be plugged and sealed to prevent groundwater contamination. Rule 12 requires that all monitoring wells be plugged and abandoned within 1 year of their construction unless a permit is obtained for continued use.

Wyoming Department of Environmental Quality (WYDEQ), Water Quality Rules and Regulations, Chapter XI, Part G, "Well Construction," Section 62, lists comprehensive requirements for closure and protection of wells and boreholes.

Finding

Active, inactive, and abandoned monitoring wells, piezometers, and cased boreholes at NPOSR-CUII have not been adequately closed or sealed as required by Colorado Office of the State Engineer and WYDEQ requirements.

Discussion

At NPOSR-CUII sites, there are monitoring wells, piezometers, and cased boreholes that are not properly secured or protected in accordance with Colorado and Wyoming regulations. These unsecured wells, lysimeters, and cased boreholes present potential pathways for groundwater contamination. During inspections of monitoring wells, lysimeters, and cased boreholes the Environmental Subteam identified the following deficiencies:

- At the NPR-3 industrial landfill, no locks had been installed on three groundwater monitoring wells: 17-32-X-3, A-7-63-X-4, and 17-33-X-3 (I-GW-17).

- At NPR-3, no locks had been installed on two groundwater wells located at the land farm: 88-13-X-4 and 78-55-X-4 (I-GW-54).

- At NOSR-1, the lock on Corehole No. 22 was missing, and the well had been vandalized (I-GW-4).

- At NOSR-3, no locks had been installed on groundwater monitoring wells, cased test borings, and one lysimeter: AV-1, AV-9, OR-7, AV-4A, AV-4B, ORC-1, and two cased bore holes at the Rulison Mine spent shale pile.

NPOSR-CUII has not plugged and sealed abandoned wells at NOSR-1 and NOSR-3 to prevent groundwater contamination nor have they obtained a continued use permit as required by Rule 11 and 12, respectively. All wells were installed prior to 1988.

This finding was not identified in the DOE/NPOSR-CUII self-assessment (April 1992) or in the JBEC self-assessment (April 1992).

The apparent causal factor for this finding is policy implementation in that NPOSR-CUII has not adequately implemented Wyoming and Colorado regulatory requirements. A secondary contributing factor for this finding is appraisals/audits/reviews in that the wells have not been previously identified as needing either permits and maintenance or abandonment.
The following issues regarding oil well abandonment were identified by the DOE management tool to assess the condition of plugged and abandoned oil wells:

WOOCC Vyoing Oil Abandoned, Section III, Rule 315, "Plugging of wells, stratigraphic tests, core, or other exploratory holes," anticipate and address potential abandoned wells be

Environmental Subteam: Discussion requires that DOE "initiate risks to the quality of the environment or public welfare."

NPOSR-CUII specifies the formations. EXllples of the Supervisor or as set forth hereinafter and in a manner sufficient to properly protect possible and probable oil or gas bearing formations."

WOGCC Rules and Regulations, Section III, Rule 317, requires that all abandoned wells be marked with a permanent monument, plug, or seal and specifies the information that must be shown on the marker.

Finding Abandoned, temporarily abandoned, or plugged and abandoned oil wells at NPR-3 are not adequately managed to protect possible or probable oil or gas-bearing formations.

Discussion NPOSR-CUW has not developed an oil well abandonment management program at NPR-3. The JBC Technical Service group has generated a series of inventory programs for listing oil well status (I-GW-57). However, no formal abandonment management program exists for utilizing the inventory program as a management tool to assess the condition of plugged and abandoned oil wells.

The following issues regarding oil well abandonment were identified by the Environmental Subteam:

The U.S. Navy oil wells were improperly plugged and abandoned when operation of the oil field was shut down during the Teapot Dome affair in 1928. For example:

- The Navy Well 204 A 34 plugging log indicates that the well was mudded up and the casing was plugged with soil and not properly plugged and abandoned (I-GW-36). The Navy Well 201 2 38 79 plugging log indicated that the well was plugged with rocks and cement, which is not an accepted plugging technique. In addition, the well is not identified with an abandonment marker.
- The Navy Well 101 A 28 plugging log indicated that the well was not properly abandoned (I-GW-36).

No abandoned well management program is in place to ensure the integrity of previously plugged and abandoned oil wells. It is important to inspect plugged and abandoned oil wells periodically to determine if cement plugs are holding and to inspect the integrity of the casings. Without such a program, the potential exists for surface water to impact oil bearing formations. The Environmental Subteam observed the following deficiencies in the integrity of abandoned wells:

Well No. 108 A 29 was observed to be leaking. Water from an unknown source has pooled around the abandonment monument inside the well casing (I-GW-36).

Well No. 111 A 29 was observed to be leaking. Water from an unknown source is located in the annulus between the tubing and the casing.

Well No. 51 SHX 15 is not properly cemented. This has resulted in the abandonment monument moving freely in the casing. Additionally, fluid was observed in the casing approximately 10 feet from the surface.

There are abandoned oil wells located throughout NPR-3 that are not adequately secured. These oil wells were never put into production, and no effort has been made to effectively secure these wells. The oil well casings are open to the environment, which creates an immediate pathway to groundwater and oil bearing formations. Examples of unsecured open-ended oil well casings are as follows:

Well No. 48 SHX 2 was observed to have water in the casing. Additionally, approximately 20 cubic yards of diesel-contaminated soil is located approximately 30 feet upgradient from the oil well casing. The potential exists for rain to transport this contaminated soil into the well bore.

Well Nos. 84 SHX 4, 33 X 23, and 25 JX 10 were covered with plastic buckets.

Well No. 51 STX 26 was covered with a road cone.

Well No. 32 SX 23 was covered with a thread protector over the casing.

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBC self-assessment (April 1992) did not identify this finding. The apparent causal factors for this finding are policy implementation and design. NPOSR-CUW has not implemented an oil well abandonment management program that complies with WOGCC Rules 315 and 317. The plugging/abandonment methods used are not sufficient to protect groundwater and oil-bearing
formations. A secondary contributing factor for this finding is insufficient appraisals/audits/reviews to periodically assess the condition of all oil wells at NPR-3.

FINDING GM/CF-6: Unauthorized Use of Disposal Wells

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Section 5.a, states "It is DOE policy to conduct its operations in an environmentally safe and sound manner. Protection of the environment and the public are responsibilities of paramount importance and concern to DOE. Accordingly, it is DOE policy to conduct the Department's operations in compliance with the letter and spirit of applicable environmental statutes, regulations, and standards."

The Wyoming Oil and Gas Conservation Commission (WOGCC) approved amendments to disposal well permit 34-CMX-10 and 74-CMX-10 on February 1, 1990. These amendments stipulate that only (1) fluids recovered from a variety of drilling and production operations from designated geologic formations and (2) filter backwash and softener regeneration brine from the steam generators be injected. No permit for well 51-CMX-10 was available for review. The three wells have been used for unauthorized disposal of rainwater (I-GII-36).

Discussion

Three disposal wells are located at the NPR-3 Water Disposal Facility. The two existing well permits stipulate that only fluids recovered from a variety of drilling and production operations from designated geologic formations and filter backwash and softener regeneration brine from the steam generators be injected. No permit for well 51-CMX-10 was available for review. The three wells have been used for unauthorized disposal of rainwater (I-GII-36).

Two concrete containment basins are provided for accumulation of drums of wastes at the Hazardous Waste Accumulation Area at NPR-3. During 1991, it was considered possible that rainwater which had collected in these basins had been contaminated by the contents of the drums within the basins. One of the drums contained dibutyl phthalate, listed as hazardous waste number U069 in 40 CFR 261. The other drums contained unknown materials. The rainwater was transferred to four drums. A composite sample from the drums of water was analyzed in August 1991, and it was determined the material did not require management as hazardous waste (I-GII-36).

In June 1992, JBEC disposed of the rainwater by injection into the disposal wells at the NPR-3 Water Disposal Facility. The WOGCC was not contacted for authorization to dispose of this water.

The DOE/NPOS-CUM self-assessment (April 1992) and the JBEC self-assessment (April 1992) did not identify this finding.

The apparent causal factors for this finding are policy implementation, in that DOE/NPOS-CUM and JBEC have no programs to prevent unauthorized materials from disposal by injection; and human factors, in that unauthorized disposal of waste was allowed.
Contaminated Soil Management and Surveillance

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 5.b[1], requires that environmental surveillance be conducted to monitor effects, if any, on onsite and offsite environmental and natural resources. Environmental surveillance is required to satisfy the following program objectives: verify compliance with environmental laws and regulations; verify compliance with environmental commitments in environmental assessments, environmental impact statements, and safety analysis reviews; characterize and define trends in environmental media; establish baselines of environmental quality; continually assess pollution abatement programs; and identify and quantify new or existing environmental problems. Section 5.b(2) requires that environmental surveillance programs reflect facility characteristics.

Wyoming Department of Environmental Quality (WYDEQ) Solid Waste Management Rules Chapter I, "General Provisions," Section 1(e)(PP), defines "promiscuous dumping" as the "unauthorized placement of solid wastes in an area that is not approved by the department as a solid waste management facility." Section 1(e)(XX) defines "solid waste" as "... solid materials resulting from industrial... activities...."

WYDEQ Solid Waste Management Rules Chapter I, Section 1(h)(i), states that promiscuous dumping is prohibited.

WYDEQ Solid Waste Management Rules, Chapter VIII, "Special Waste Management Standards," Section 2(f), states "Petroleum-contaminated soils' means solid waste consisting of any natural or manmade soil or rock material into which petroleum product has been added, excluding hardened asphalt rubble."

Finding

Promiscuous dumping of contaminated soils, which is prohibited by WYDEQ, has occurred at NPR-3. NPOSR-CUW has not developed a surveillance program to monitor the impact of previously disposed contaminated soils as required by DOE 5400.1.

Discussion

Promiscuous dumping of contaminated soils has occurred in at least two locations at NPR-3 which are not solid waste disposal areas permitted by WYDEQ (see Finding WM/CF-6).

Approximately 20 cubic yards of diesel-contaminated soil was improperly disposed at well location 48-SHX-2. The contaminants have not been analyzed to determine potential adverse effects on the environment (I-GW-36).

An unknown quantity of contaminated soil of unknown origin was improperly disposed at well location 61-STX-15 (I-GW-37). The material has not been analyzed to determine the type and concentration of contaminants, and thus its potential to harm the environment (I-GW-58).
3.5.4 Waste Management

3.5.4.1 Overview

The purpose of the waste management portion of the Environmental Subteam assessment was to evaluate the current status of hazardous and nonhazardous waste management practices at NPOSR-CU with respect to compliance with Federal and state regulations, state permits and guidelines, DOE Orders, NPOSR-CUW procedures, and best management practices. The regulations, requirements, and guidelines used in this assessment are presented in Table 3-6.

The assessment included discussions and interviews with state regulators, DOE/NPOSR-CUW, the Environmental Department of JBEC, JBEC employees within the Operations Department with waste management facility responsibilities, and other JBEC personnel involved in waste generation and management; a review of waste management documents, including policies, procedures, plans, logbooks, contracts, and hazardous waste manifests; observations of waste generation and management practices; and inspections of waste management facilities.

This overview is intended to frame the scope of waste management activities at NPOSR-CUW including waste management responsibility, waste generation, waste management systems, and a summary of findings. Also included is an evaluation of the status of corrective action with respect to findings of the 1988 Environmental Survey.

Responsibility for hazardous and nonhazardous waste management at NPOSR-CUW is divided between the Operations Department and the Environmental Department. General oversight is provided by the Environmental Department of JBEC and, recently, by the DOE (Environmental Protection Specialist). Roles and responsibilities for waste management at the active NPOSR-CUW sites (NPR-3, NOSR-1, and NOSR-3) have not been formally defined but an ad hoc division of responsibility has developed between the two departments (Environmental and Operations) that perform the day-to-day functions pertaining to waste management. JBEC recently established a position for a waste management specialist; however, that position has not yet been filled. JBEC has also recently hired a training specialist. However, training programs specific to waste management have not yet been fully developed, tracked, or implemented.

NPOSR-CUW consists of four distinct sites: two in Colorado and one each in Wyoming and Utah. There has been no development of resources at NOSR-2 in Utah, and no wastes have been generated; therefore, NOSR-2 was not included in the current waste management assessment. The two sites in Colorado, NOSR-1 and NOSR-3, host DOE work related to environmental restoration and drilling and operating offset wells. Environmental restoration activities at NOSR-1 and NOSR-3 are not presently generating appreciable quantities of waste. Most operations of the NPOSR-CUW, and therefore most waste generation, occur at NPR-3.

Hazardous wastes generated at NPR-3 include spent solvent and characteristic wastes. The most significant point of hazardous waste generation appears to be the grindout laboratories, where crude oil quality is tested. This test results in a 75:25 mixture of ignitable solvent (Solvent 140) and crude oil. Another routine source of hazardous waste is the parts washer in the maintenance shop. NPSR-3 also has generated hazardous waste associated with

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<thead>
<tr>
<th>Regulations/Requirements/Guidelines</th>
<th>Sections/Title</th>
<th>Authority</th>
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<tbody>
<tr>
<td>DOE 5400.1</td>
<td>General Environmental Protection Program</td>
<td>DOE</td>
</tr>
<tr>
<td>DOE 5480.19</td>
<td>Conduct of Operations Requirements for DOE Facilities</td>
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<td>DOE 5700.6C</td>
<td>Quality Assurance</td>
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<td>CERCLA</td>
<td>Section 7 - Liability</td>
<td>EPA</td>
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<tr>
<td>40 CFR 260</td>
<td>Hazardous Waste Management System: General</td>
<td>EPA</td>
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<td>40 CFR 261</td>
<td>Identification and Listing of Hazardous Waste</td>
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<td>40 CFR 262</td>
<td>Standards Applicable to Generators of Hazardous Waste</td>
<td>EPA</td>
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<td>40 CFR 264</td>
<td>Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities</td>
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<tr>
<td>40 CFR 265</td>
<td>Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities</td>
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<tr>
<td>40 CFR 268</td>
<td>Land Disposal Restrictions</td>
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<td>40 CFR 270</td>
<td>EPA Administered Permit Programs: The Hazardous Waste Permit Program</td>
<td>EPA</td>
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<tr>
<td>40 CFR 280</td>
<td>Technical Standards and Corrective Action Requirements for Owners and Operators of Underground Storage Tanks (UST)</td>
<td>EPA</td>
</tr>
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<td>54 Federal Register 25056, June 12, 1989</td>
<td>Draft Guidance to Hazardous Waste Generators on the Elements of a Waste Minimization Program</td>
<td>EPA</td>
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<td>W.S. 35-11-500</td>
<td>Wyoming Environmental Quality Act - Article 5, Solid Waste Management</td>
<td>WYDEQ</td>
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</table>
TABLE 3-6
LIST OF WASTE MANAGEMENT REGULATIONS/REQUIREMENTS/GUIDELINES

<table>
<thead>
<tr>
<th>Regulations/Requirements/Guidelines</th>
<th>Sections/Title</th>
<th>Authority</th>
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<tr>
<td>W.S. 35-11-1400</td>
<td>Water Pollution from Underground Storage Tanks Corrective Action Act of 1990</td>
<td>WDEQ</td>
</tr>
<tr>
<td>Section III</td>
<td>Rules and Regulations of Wyoming Oil &amp; Gas Conservation Commission</td>
<td>WOGCC</td>
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<tr>
<td>Chapter III</td>
<td>Wyoming Solid Waste Management Rules - Industrial Landfill Regulations</td>
<td>WDEQ</td>
</tr>
<tr>
<td>Chapter VI</td>
<td>Wyoming Solid Waste Management Rules - Transfer, Treatment, and Storage Facility Regulations</td>
<td>WDEQ</td>
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<td>Chapter II</td>
<td>Wyoming Hazardous Waste Management Regulations - Identification and Listing of Hazardous Waste</td>
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<td>Chapter VIII</td>
<td>Wyoming Solid Waste Management Rules - Special Waste Management Standards</td>
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<td>Underground Storage Tank (UST) Wastes</td>
<td>WDEQ</td>
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<tr>
<td>Disposal Guideline No. 2</td>
<td>Petroleum-Contaminated Soils</td>
<td>WDEQ</td>
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<tr>
<td>Disposal Guideline No. 5</td>
<td>Identification of Friable and Nonfriable Asbestos</td>
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<tr>
<td>Disposal Guideline No. 6</td>
<td>Natural Gas Processing Plant Wastes</td>
<td>WDEQ</td>
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<tr>
<td>C.R.S. 25-118-100</td>
<td>Colorado Underground Storage Tanks Law</td>
<td>Colorado Department of Health</td>
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<tr>
<td>7 C.C.R. 100 C. C. R. 1007 Article 14 and 6</td>
<td>Colorado Underground Storage Tanks Regulations</td>
<td>Colorado Department of Health</td>
</tr>
<tr>
<td>6 C.C.R. 1007 Article 3</td>
<td>Rules and Regulations Pertaining to Hazardous Waste</td>
<td>Colorado Department of Health</td>
</tr>
</tbody>
</table>

With site cleanup activities, NPOSR-CUW has effectively reduced the amount of hazardous waste generated by substituting nonhazardous materials whenever possible and recycling hazardous wastes such as batteries.

NPOSR-CUW was issued two EPA hazardous waste generator identification numbers: one for NPR-3 and one for NOSR-I and NOSR-3. NPOSR-CUW does not continually track the amount of hazardous waste generated on a monthly basis to determine generator status at NPR-3 or NOSR-I and NOSR-3. NPOSR-CUW currently manages its waste at NPR-3, NOSR-1, and NOSR-3 as conditionally exempt small quantity generators (CESQGs). If NPR-3 or NOSR-1 and NOSR-3 generate more than 100 kilograms of hazardous waste in a month or accumulate more than 1,000 kilograms at any time, that facility would be considered a small quantity generator, which places restrictions on the amount of time that hazardous waste may be accumulated, and affects the design, operations, and emergency planning requirements for temporary hazardous waste accumulation areas.

NPOSR-CUW could not provide documentation to prove that the 100 kilograms monthly limit and/or the 1,000 kilogram accumulation limit had not been exceeded. Thus, NPR-3 was evaluated as though it was a small quantity generator. NOSR-1 and NOSR-3 were evaluated as a CESQG due to the lack of ongoing waste generation at these sites.

NPR-3 is engaged in oil and gas production using a variety of primary, secondary, and tertiary techniques. Much of the waste associated with oil and gas production is exempt from the Federal hazardous waste regulations (FR 25446). Drilling and reworking activities associated with production wells (including oil, water, and injection wells) produce drilling mud, cuttings and well cement, produced waters, and sediments and sludges from produced water pits. Oil from the wells is routed to test satellites and tank batteries, where water and other impurities are removed to produce crude oil for sale. Produced water from the tank batteries is discharged to pits. This water contains residual petroleum products. Other Resource Conservation and Recovery Act (RCRA) Subtitle C-exempt wastes generated at NPR-3 include: sediment and tank bottoms from pits and storage tanks; pigging wastes; soil contaminated with crude oil; and spent filters.

NPR-3 also generates nonhazardous waste that is not associated with oil and gas exploration and production including, construction debris, scrap metal, office waste, and waste oil from vehicle and pump maintenance. NPOSR-CUW has implemented recycling programs for office paper and aluminum cans.

Naturally occurring radioactive material (NORM) is generated at NPOSR-CUW, some of which eventually becomes waste. It appears that no mixed waste is stored or generated at NPOSR-CUW.

NPR-3 has a number of operations to treat and dispose of oil and gas production waste and nonhazardous waste including: dewatering and backfill of reserve pits, oil/water separation in produced water pits (including the Bad Oil Facility), road application, petroleum-contaminated soil treatment, and landfilling of industrial waste.

Reserve pits are constructed whenever wells are constructed or reworked. These pits are used to contain drilling muds, cuttings, produced waters, grout, and other fluids. Following completion of the well work the pits are dewatered and buried in place. NPOSR-CUW has received a general approval from
the Wyoming Oil and Gas Conservation Commission (WGOGC) to construct reserve pits.

The produced water pits are associated with tank batteries, test satellites, the Water Disposal Facility, and the steamflood and waterflood operations. Oil atop the water is skimmed using a vacuum truck and hauled to the Bad Oil Facility. The Bad Oil Facility also receives crude oil from various locations at NPR-3, where it is treated to improve quality.

Sludge from the Bad Oil Facility and sediments from produced water pits and tank cleanouts are stored in three aboveground tanks and then applied to roads at NPR-3. NPOSR-CUW has not received the necessary permit from WYDEQ to conduct road applications in 1992 so the last road application event occurred in 1981. Road application involves spraying the waste on the roads using a vacuum truck; prior to application a berm is built along each side of the road to contain road applied fluids. Periodic testing of the fluids is also required by WYDEQ.

NPOSR-CUW operates an area for the treatment of petroleum-contaminated soils, where oil-soaked dirt is left to weather and is periodically spread. The area also used for drying other wastes, such as spent iron sponge from the LTS Gas Plant, prior to disposal in the landfill. The area has operated for nearly 1 year; however, none of the treated soil has met the decontamination requirements for disposal.

NPR-3 also hosts a commercial landfill where general nonhazardous wastes are buried. The landfill is located within a fenced area and disposal is accomplished using the trench method. The facility operates 3 days a week for a half-hour each day; during these periods employees may dump trash directly into the trench. A dumpster is located outside the fenced area for general use during non-operating hours. The landfill permit expired on July 1, 1992, and DOE has submitted a renewal application to WYDEQ.

NPOSR-CUW has underground storage tanks (USTs) at NOSR-1 and NPR-3. DOE recently became aware of the two tanks at NOSR-1 when they were exposed due to natural erosion and subsidence. The tanks have not been registered with the Colorado Department of Health. The size and previous use for these tanks are not known at this time; however, NPOSR-CUW is currently characterizing the condition and contents of the tanks. Three USTs are operating at NPR-3: a 4,000-gallon tank and a 2,000-gallon tank for unleaded gasoline and a 4,000-gallon tank for diesel fuel. The tanks were installed in 1979 and feature a pressurized piping pump system with cathodic protection which was installed around 1984. In addition, two USTs have been removed from NPR-3 within the last 3 years.

The 1988 Environmental Survey identified three Category IV issues at the site: inadequate management of retaining pits, unauthorized disposal of some pit wastes in the tank rings, and incomplete notification of USTs. The status of corrective action on these findings is as follows:

NPOSR-CUW has corrected the notification and permitting requirements for retaining pits identified in the survey. However, the site still has not informed the WOGCC of pit closures and reclamation.
3.3.4.2 Compliance Findings

**FINDING WM/CF-1: Waste Minimization Plan**

**Performance Objective**

DOE 5400.1, "General Environmental Protection Program," Chapter III, Section 4.b, requires that a waste minimization plan and program be in place by May 9, 1990. As part of that program, a plan is to be developed that would include goals for minimizing wastes with annual reductions, a comparison of reductions achieved with the reductions of the previous year, and the methods that accomplish waste minimization.


**Finding**

The NPOS-CUI waste minimization plans have not been fully implemented and do not fully meet the requirements of DOE 5400.1.

**Discussion**

JBEC prepared draft waste minimization plans for NPP-3 (WM-11), NOSR-1, and NOSR-3 (WM-12) to satisfy the requirements of DOE 5400.1. These plans were prepared in April 1990 and approved by DOE in May 1990 (WM-44).

NPOS-CUI has not implemented the waste minimization requirements of DOE 5400.1 (I-WM-23 and I-WM-25):

- There have been no annual reviews or updates of the plans;
- Annual changes in waste volume and toxicity have not been tracked (I-WM-12 and I-WM-21); and
- The proposed technical and economically practical methods of treatment, storage, and disposal to accomplish waste minimization have not been reported.

The waste minimization plans do not contain the following elements as recommended by the "Implementation Guidance for DOE Order 5400.1":

- Specific numeric goals for reducing the volume or toxicity of each waste stream;
- Accurate cost accounting including the assessment of charges to departments for waste disposal;
- Mechanisms for technology transfer; and
- Opportunities to reduce waste generated by non-routine activities (e.g., decontamination and decommissioning, remediation activities).

Many of the programs contained in the waste minimization plans have not been formally implemented. For example:

- Waste accountability at the managerial, organizational, or project level has not been established (I-WM-24 and I-WM-26);
- The site Waste Minimization Committee does not meet monthly (I-WM-23 and I-WM-25);
- Satellite storage areas have not been established, and there is no documentation of waste generation at the managerial level (I-WM-12);
- A Pollution Prevention and Awareness Program has not been developed (see Finding TCM/CF-4);
- An employee awareness program has not been implemented (I-WM-10 and I-WM-13); and
- There has been no training specific to waste minimization (I-WM-7).

This finding was fully identified in the DOE/NPOS-CUI self-assessment (April 1992). This finding was partially identified in the JBEC self-assessment (April 1992). The JBEC self-assessment only identified the lack of an annual review of the waste minimization plans.

The apparent causal factors for this finding are **policy implementation and procedures**. NPOS-CUI has not implemented DOE requirements on waste minimization. Procedures for waste minimization as described in the waste minimization plans have not been developed.
Performance Objective
40 CFR 262.11 states that any person who generates a solid waste must determine whether that waste is a hazardous waste. If the waste is determined to be hazardous, the generator must refer to 40 CFR 264, 265, and 268 for possible exclusions or restrictions on this waste.

Chapter II of the Wyoming Hazardous Waste Management Regulations sets forth the criteria used by the Wyoming Department of Environmental Quality (WYDEQ) to identify characteristics of hazardous waste.

Title 6 of the Code of Colorado Regulations, Part 261 (6 C.C.R. 261), defines the characterization requirements to determine if a waste is hazardous.

WYDEQ Solid Waste Management Program Guideline No. 2, "Petroleum Contaminated Soils," requires treated soils to be tested prior to disposal. The guideline also requires that all contaminated soils received for treatment and disposal be accompanied by written documentation which describes the source of the wastes, volume of contaminated soils, and the type of contamination.

The WYDEQ Solid Waste Management Program Guideline No. 7, "Natural Gas Processing Wastes," outlines acceptable sampling, laboratory testing, and reporting procedures for process wastes that may be generated at natural gas processing plants.

Land Application Permit No. 90-073R, issued by the WYDEQ, requires testing of waste once per every 1,500 barrels of waste applied to roads.

WYDEQ issued a one-time authorization on September 27, 1991, to dispose of spent iron sponge waste in the NPR-3 landfill provided the waste did not contain any free liquids as determined by the Paint Filter Liquids Test (EPA Method 9095). WYDEQ issued a similar one-time authorization for the disposal of polycrylamide waste on July 23, 1991.

Finding
There are no waste characterization programs or procedures at NPOSR-CUW to satisfy the requirements of 40 CFR 262.11 and the WYDEQ.

Discussion
Waste characterization begins at the point of generation and is based on process knowledge. Most decisions regarding waste processing occur at this level. Wastes that are suspected to be hazardous or require special testing as a result of regulation or permit must be sampled and analyzed to determine composition. This information can be used to prescribe proper treatment and disposal and also provides the generator with important information on waste volume and toxicity, which is necessary to determine regulatory status under the Resource Conservation and Recovery Act (RCRA) (see Finding WM/CF-1) and to implement an effective waste minimization program (see Finding WM/CF-1).

NPOSR-CUW does not have formal written sampling and analysis procedures to characterize hazardous and nonhazardous waste (1-WM-12 and 1-WM-23). There are no guidelines specifying: sampling methods for gaseous, liquid, solid and semi-solid wastes; analytical parameters; and quality assurance, including duplicate samples and blanks. The lack of procedures has resulted in some wastes not being properly characterized. For example:

Hazardous waste discovered at NOSR-1 and NOSR-3 was determined by NPOSR-CUW to be nonhazardous. This waste was subsequently returned by the vendor because it was found to be ignitable (1-WM-18 and 1-WM-21). NPOSR-CUW did not test the waste for ignitability prior to shipment as nonhazardous (1-WM-18).

Uncharacterized wastes have been accumulating in the Temporary Hazardous Waste Accumulation Area at NPR-3 for over a year (WM-17; 1-WM-12).

Grindout waste consisting of approximately 75 percent Solvent and 25 percent crude oil is not currently being managed as a hazardous waste despite analytical results that indicate the mixture meets the 40 CFR 261.21 definition of ignitability (WM-27 and WM-28).

There is no adequate method to ensure that samples of petroleum-contaminated soils are representative, and required testing of petroleum-contaminated soils resulting from spills of diesel fuel and lubricating oil has not been performed (1-WM-21).

Each unique waste stream generated at the LTS Gas Plant has not been characterized in accordance with the waste characterization criteria of WYDEQ Guideline No. 7 (1-WM-21).

The holding tanks for sludge awaiting road application are sampled at a single point in the tank (1-WM-23). The tanks are not mixed, therefore the sample would not account for any differences in waste composition caused by stratification in the tank (1-WM-24).

Iron sponge waste and polycrylamide waste were placed in the landfill without required testing for free liquids (WM-35; 1-WM-16 and 1-WM-21).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) partially identified this finding. Both self-assessments identified the lack of a waste characterization program; however, there were no specifics as to deficiencies in compliance with Federal and state requirements.

The apparent causal factors for this finding are policy implementation and procedures. NPOSR-CUW has not implemented written policies for Federal and state waste characterization requirements. Procedures for waste characterization have not been developed.
FINDING WM/CF-3: Recordkeeping

Performance Objective

40 CFR 261.5 contains specific regulations for generators of less than 100 kilograms of hazardous waste in a calendar month that accumulate less than 1,000 kilograms of hazardous waste at any given time (conditionally exempt small quantity generator).

40 CFR 262.34 contains specific regulations for generators of between 100 and 1,000 kilograms of hazardous and mixed waste in a calendar month (small quantity generator) and generators of greater than 1,000 kilograms of waste in a calendar month (generator).

40 CFR 262.42(b) requires small quantity generators of hazardous waste to report to the EPA if a signed copy of the manifest is not received from the designated treatment, storage, or disposal facility within 60 days of the waste being accepted by the initial transporter. Best management practice suggests that manifests should be maintained in a single location to facilitate tracking of hazardous waste shipments.

Wyoming Department of Environmental Quality (WYDEQ) Solid Waste Management Program Guideline No. 2, "Petroleum Contaminated Soils," requires treated soils to be tested prior to disposal. The guideline also requires that all contaminated soils received for treatment and disposal be accompanied by written documentation which describes the source of the wastes, volume of contaminated soils, and the type of contamination.

Land Application Permit No. 90-073R, issued by the WYDEQ, requires testing of waste once per every 1,500 barrels of waste applied to roads.

Finding

NPOSR-CUiI does not have policies or procedures in place to monitor hazardous waste generator status to ensure compliance with 40 CFR 261.5 or 262.34. NPOSR-CUiI does not adequately maintain records of hazardous and nonhazardous waste, as required by WYDEQ and suggested by best management practices.

Discussion

NPOSR-CUiI does not continually track the amount of hazardous waste generated on a monthly basis (I-WM-12, I-WM-23, and I-WM-25). This tracking is required to determine NPOSR-CUiI's generator status. NPOSR-CUiI currently manages its waste as if NPR-3 and NOSR-1 and NOSR-3 are conditionally exempt small quantity generators. If NPR-3 or NOSR-1 and NOSR-3 generate more than 100 kilograms of hazardous waste in a month or accumulate more than 1,000 kilograms at any time, then the facility would be considered a small quantity generator, which places restrictions on the amount of time that waste may be accumulated, and affects the design, operations, and emergency planning requirements for temporary hazardous waste accumulation areas. NPOSR-CUiI could not provide documentation to prove that the 100 kilogram monthly limit and/or the 1,000 kilogram accumulation limits had not been exceeded (I-WM-12, I-WM-23, I-WM-24, and I-WM-25).

In addition to recordkeeping deficiencies related to hazardous waste generation, NPOSR-CUiI also does not maintain required records for treatment and/or disposal of nonhazardous waste. For example:

The permit for road application at NPR-3 issued by the WYDEQ requires sampling once per every 1,500 barrels of waste applied. No records exist at NPR-3 to indicate the amount of waste applied to the roads to determine sampling requirements (I-WM-21).

JBEC informed the WYDEQ that it would record the location in the NPR-3 landfill where 33 empty drums were disposed (WM-31). No such records were found at NPR-3 (I-WM-21) (see Finding WM/CF-7).

Records of source, volume, and characteristics of contaminated soils at the land farm are not kept as required by WYDEQ Guideline No. 2 (I-WM-16 and I-WM-21) (see Finding WM/CF-6).

NPOSR-CUiI also does not have a formal procedure to ensure that signed copies of manifests are provided for treated, stored, or disposed waste within 60 days of shipment. The Environmental Subteam observed that original copies of manifests were on file at the NPOSR-CUiI offices in Casper, WY, and at the NPR-3 site. Neither location had a complete set of manifests for hazardous waste shipments from NPOSR-CUiI (I-WM-12 and I-WM-10). Best management practices suggest that complete manifest records be maintained at a single location to enable tracking of hazardous waste shipments.

This finding was partially identified in the DOE/NPOSR-CUiI self-assessment (April 1992). The DOE self-assessment did not identify the absence of a system at NPOSR-CUiI to track and monitor Resource Conservation and Recovery Act (RCRA) generator status. This finding was partially identified in the JBEC self-assessment (April 1992). The JBEC self-assessment identified the lack of formal recordkeeping, but did not specify instances of noncompliance.

The apparent causal factors for this finding are policy implementation and procedures. NPOSR-CUiI has not implemented written policies for Federal and state waste recordkeeping requirements, and has not developed formal procedures to comply with these regulations.
FINDING WM/CF-4: Satellite Hazardous Waste Accumulation Areas

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states "It is the policy of the Department that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities . . . ."

40 CFR 262.34(c)(1) allows the accumulation of "as much as 55 gallons of hazardous waste or one quart of acutely hazardous waste . . . at or near any point of generation where wastes initially accumulate, which is under the control of the operator of the process generating the waste, without a permit or interim status . . . provided he: Complies with [40 CFR] 265.171, 265.172, and 265.173(a) . . . ." In addition, 40 CFR 262.34(c)(1) requires containers to be labeled with the contents or the words "hazardous waste."

40 CFR 265.173 states that hazardous waste containers must always be closed during storage except when adding or removing waste.

Finding

Satellite accumulation areas at NPOSR-CUV do not fully comply with 40 CFR 262.34, and management techniques are inadequate to ensure compliance with EPA requirements.

Discussion

As a conditionally exempt small quantity generator, NPR-3 would be exempt from the requirements of 40 CFR 262. However, due to deficiencies in recordkeeping (see Finding WM/CF-3) and waste characterization (see Finding WM/CF-2), NPOSR-CUV cannot demonstrate that it has not stored more than 1,000 kilograms of hazardous waste onsite at any one time. As a small quantity generator, NPR-3 would be subject to certain provisions of 40 CFR 262 including 40 CFR 262.34(b), which regulates the operation of satellite hazardous waste accumulation areas.

Most hazardous waste at NPR-3 is stored at the onsite Hazardous Waste Accumulation Area; however, grindout waste from test satellites, tank batteries, and the South Terminal is collected into aboveground tanks. Rags from the grindout laboratories are collected in a covered container and delivered to a subcontractor where they are laundered and reused. The Environmental Subteam observed that the grindout waste was not identified as hazardous waste; however, laboratory analyses indicated that the grindout waste, which consists of about 75 percent waste solvent and 25 percent crude oil, is hazardous because it exhibits the characteristic of ignitability (40 CFR 262.21).

The grindout laboratories are satellite hazardous waste accumulation areas and, therefore, must comply with 40 CFR 262.34(c). There were, however, several deficiencies in the management of these areas. For example:

The collection system for the grindout wastes allows for the accumulation of 100 - 200 gallons of waste in the tank. The maximum allowable accumulation at or near the point of generation is 55 gallons (40 CFR 262.34(c)(1)).

Hazardous waste containers must be closed except when adding or removing waste (40 CFR 265.173). The waste collection system at the grindout laboratory is filled by a sink drain, which is not closed when not in use.

Rags soaked with grindout waste are not managed as hazardous waste nor are the containers used to collect these rags marked either with the name of the contents (i.e., Waste Solvent 140) or with the words "hazardous waste," as required by 40 CFR 262.34(c)(1)(ii).

In addition, NPOSR-CUV does not have procedures for managing the satellite hazardous waste accumulation areas, which are necessary to ensure compliance with DOE 5480.19.

The DOE/NPOSR-CUV self-assessment (April 1992) and the JBEIC self-assessment (April 1992) did not identify this finding.

The apparent causal factors for this finding are design, in that the grindout waste tanks are too large for a satellite hazardous waste container; and a lack of policy and procedures to implement a program to manage satellite accumulation areas to ensure compliance with Federal regulations and DOE 5480.19.
FINDING WM/CF-5: Temporary Hazardous Waste Accumulation

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states "It is the policy of the Department that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities ... ."

40 CFR 262.34(d) contains requirements for temporary hazardous and mixed waste storage areas applicable to small quantity generators. These requirements include: container management (compatible material, labeling, dating, integrity), preparedness and prevention (40 CFR 265 Subpart C), and emergency procedures (40 CFR 262.34(d)(5)).

40 CFR 262.34(f) states that a small quantity generator is considered an owner or operator of a storage facility, and is subject to the requirements of 40 CFR 264, 265, and 270, if hazardous waste accumulates for more than 180 days (or 270 days if hazardous waste must be transported greater than 200 miles).

Finding

NPOSR-CUW is storing hazardous waste beyond statutory accumulation times without a permit or interim status as required by 40 CFR 262.34(f), and operation of the temporary hazardous waste accumulation area at NPR-3 is not in accordance with 40 CFR 262.34(d) or DOE 5480.19.

Discussion

As a conditionally exempt small quantity generator, NPR-3 would be exempt from the requirements of 40 CFR 262. However, due to deficiencies in recordkeeping (see Finding WM/CF-3) and waste characterization (see Finding WM/CF-2), NPOSR-CUW cannot demonstrate that it has not stored more than 1,000 kilograms of hazardous waste onsite at any one time. As a small quantity generator, NPR-3 would be subject to the applicable provisions of 40 CFR 262 containing 40 CFR 262.34(d), which regulates temporary accumulation of hazardous waste for small quantity generators.

Hazardous waste generated at NPR-3 is brought to the Temporary Hazardous Waste Accumulation Area by JBEC personnel. There are no formal procedures governing the operation of this facility. This has resulted in several instances of noncompliance with Federal regulations. For example:

Not all containers are in good condition (40 CFR 265.171);

Suspected hazardous waste is being stored, uncovered, without regard for potential incompatibility with other wastes within the same containment structure (40 CFR 265.172);

Weekly inspections are not performed (I-WM-12) (40 CFR 265.174);

The start date of accumulation is not marked on each container (40 CFR 262.34(a)(2)).

In addition to the above deficiencies, there are no procedures to ensure that suspected hazardous waste is characterized and processed within the 270-day timeframe (180 days for wastes transported less than 200 miles) in compliance with 40 CFR 262.34(f). Since some of the hazardous wastes at NPR-3 have been stored beyond 270 days, the facility is technically operating as an unpermitted storage facility and must meet the requirements of 40 CFR 264, 265, and 270. NPOSR-CUW does not have a permit for continued storage of hazardous waste in the Hazardous Waste Accumulation Area nor has it applied to EPA for an extension to accumulation times.

This finding was partially identified in the ODE/NPOSR-CUW self-assessment (April 1992). The ODE self-assessment correctly identified deficiencies in overall conduct of operations at NPOSR-CUW. However, it did not identify specific shortcomings with hazardous waste accumulation. This finding was partially identified in the JBEC self-assessment (April 1992). The JBEC self-assessment did not identify several of the deficiencies at the Temporary Hazardous Waste Accumulation Area including weekly inspections, maintenance of equipment, and waste compatibility.

The apparent causal factors for this finding are personnel who do not have the knowledge and experience to effectively manage the waste management program at NPOSR-CUW; and a lack of policy and procedures to ensure compliance with hazardous waste regulations and DOE 5480.19.

Each container is not labeled or marked with the words "Hazardous Waste" (40 CFR 262.34(a)(3)); and

There are no provisions for testing and maintaining emergency response/communications equipment (40 CFR 265.33).
FINDING WM/CF-6: Treatment of Petroleum-Contaminated Soils

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states "It is the policy of the Department that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities . . . ."

Wyoming Department of Environmental Quality (WYDEQ) Guideline No. 2, "Petroleum Contaminated Soils," provides guidelines for the treatment and disposal of soils that are contaminated with petroleum products. Section I.C. of these guidelines provides testing and notification requirements for soils contaminated with petroleum products that are not related to either leaking underground storage tank products or exploration and production exempt wastes. Section III lists treatment requirements for contaminated soils.

On July 5, 1991, WYDEQ authorized treatment at NPR-3 of petroleum-contaminated soils generated from crude oil and produced fluid spills.

Finding

Operation of the land farm at NPR-3 does not comply with WYDEQ Guideline No. 2 and the WYDEQ authorization, and formal procedures to ensure compliance have not been developed, as required by DOE 5480.19.

Discussion

NPSR-CUW has constructed a treatment area for petroleum-contaminated soils at NPR-3. This facility consists of a cleared area surrounded by berms and is operated by the Maintenance Supervisor. There are no formal procedures to operate this facility in compliance with WYDEQ Guideline No. 2 and the WYDEQ authorization. For example:

- The facility has received contaminated soils from recent spills of diesel fuel and refined compressor oil (I-WM-16). These materials were not included in the WYDEQ authorization for the facility (WM-37). The WYDEQ has not been notified, nor have required tests been conducted on these contaminated soils.

- Contaminated soil at the facility is not placed in 6-inch lifts in accordance with Guideline No. 2.

- Soils are not weathered and tilled in accordance with Guideline No. 2.

- Soil is not being sampled for total petroleum hydrocarbons (TPH) after the second weathering period in accordance with Guideline No. 2.

- There are no records to indicate the date on which contaminated soil is brought to the facility for the purpose of determining the one-year reporting time required by WYDEQ if soils have not met the required treatment standard (I-WM-16).

There are no written waste characterization procedures to ensure that contaminated soils are properly tested (see Finding WM/CF-2).

There are no records of source, volume, and characteristics of contaminated soils at the land farm, which is required by Guideline No. 2 (I-WM-16 and I-WM-21).

This finding was partially identified in the DOE/NPSR-CUW self-assessment (April 1992). The DOE self-assessment correctly identified the lack of procedures; however, the fact remains that operation of the land farm was not in compliance with the WYDEQ guidelines and authorization was not acknowledged. This finding was not identified in the JEC self-assessment (April 1992).

The apparent causal factors for this finding are inadequate policy and procedures to comply with state guidelines and authorizations and DOE 5480.19. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews to identify areas of noncompliance.
FINDING WM/CF-7: Landfill Management

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states: "It is the policy of the Department that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities . . . ."

Wyoming Solid Waste Management Rules and Regulations, Chapter III, Section 2, "Industrial Landfill Regulations," requires existing industrial landfills to submit a permit renewal application by July 1, 1992, or close the facility. All existing industrial landfills shall be subject to the standards contained in the Wyoming Solid Waste Management Rules and Regulations, Chapter XV, until such time as they are permitted under Chapter I.

Chapter VIII, "Special Waste Management Standards," contains requirements for the disposal of nonfriable asbestos.

The Wyoming Department of Environmental Quality (WYDEQ) issued a renewal authorization to operate an industrial solid waste disposal facility at NPR-3 on September 6, 1991.

Finding

Operation of the landfill at NPR-3 does not comply with WYDEQ requirements and formal procedures to ensure compliance with regulations have not been developed, as required by DOE 5480.19.

Discussion

NPOSR-CUW operates an industrial landfill at NPR-3 that is used to dispose of nonhazardous solid waste. The facility disposes of industrial waste generated at NPR-3 as well as some special wastes such as small amounts of asbestos, empty drums, and LTS Gas Plant wastes (e.g., iron sponge, glycol filters). The landfill is normally open between 11:00 am and 11:30 am on Monday, Wednesday, and Friday. NPOSR-CUW personnel may drive directly to the landfill working face and dump during these periods. A JBEC employee supervises dumping during operating hours. A dumpster is maintained outside the landfill fence to permit waste disposal during off-hours. Disposal is accomplished using the trench method.

The Maintenance Supervisor is responsible for the operation of the NPR-3 landfill. He has received training in landfill operations from the WYDEQ, however, there are no qualified personnel trained to act as an operator in his absence. In addition, not all personnel disposing of waste at the landfill are familiar with the types of waste prohibited from the facility. During the Tiger Team Assessment, an employee was observed disposing of acid batteries into the trench.

There is a lack of formal operating procedures for the landfill, which are required by DOE 5480.19. The lack of procedures and formality of operations has resulted in the following problems:

Cell development has not adhered to design plans submitted to WYDEQ as part of the permit application (I-WM-16).

Nonfriable asbestos was placed in the dumpster prior to placement in the landfill (I-WM-22). WYDEQ regulations require nonfriable asbestos to be covered with 6 inches of cover material immediately upon receipt (Chapter VIII, Section 3).

Closed cells have not been promptly revegetated as described in the permit application for the landfill (WM-46).

A fire extinguisher is not positioned at the active trench.

A log of litter collection activities;

- As-built specifications of trench boundaries; and

- Dates of completion and contents of trenches.

NPOSR-CUW must submit a permit renewal application to WYDEQ by July 1, 1992 (I-WM-8). As of June 26, 1992, JBEC had not provided a draft copy of the permit to DOE for review (I-WM-25). Best management practice suggests that more than 1 week be allowed for proper review by DOE and revision of complex permit applications.

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992). The DOE self-assessment correctly identified the lack of procedures; however, there was no indication that landfill operation was not in compliance with the permit. This finding was not identified in the JBEC self-assessment (April 1992).
The apparent causal factors for this finding are inadequate policy and procedures to comply with state regulations and DOE 5480.19. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews to identify areas of noncompliance.

FINDING WM/CF-8: Management of Produced Water Pits

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states "It is the policy of the Department that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities . . . ."

Rules and Regulations of the Wyoming Oil & Gas Conservation Commission (WOGCC), Section III, "Operational Rules, Drilling Rules," Rule 326, sets forth operational standards to minimize pollution and surface damage from development and operation of produced water pits.

Finding

Management of produced water pits does not ensure compliance with WOGCC requirements, as required by DOE 5480.19.

Discussion

Earthen pits are used at NPR-3 to hold produced waters. These pits are associated with activities at individual wells (temporary), tank batteries, test satellites, and enhanced oil recovery facilities. These pits have been registered with the WOGCC in accordance with Rule 326.

NPOSR-CUW does not have formal procedures for development and operation of the produced water pits that would ensure compliance with WOGCC requirements (I-WM-14). For example:

- There are no procedures at NPR-3 to inspect produced water pits and ensure that surface accumulations of oil are removed within 10 days, as required by Rule 326 (I-WM-14); and

- NPOSR-CUW has not notified the State Oil and Gas Supervisor of the completion and reclamation of produced water pits, as required by Rule 326 (I-WM-29 and I-WM-31).

In addition, there are no procedures at NPOSR-CUW to ensure that pits are properly located, constructed and maintained, and closed in a timely manner.

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992) and the JBECC self-assessment (April 1992). The self-assessments correctly identified the lack of procedures; however, there was no indication that the produced water pits are not being managed in accordance with WOGCC Rule 326.

The apparent causal factors for this finding are inadequate policy and procedures to comply with state regulations and DOE 5480.19. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews to identify instances of noncompliance.
Finding
The management of road application of produced fluids does not ensure compliance with DOE 5480.19 and WYDEQ requirements.

Discussion
Road application of produced fluids has not occurred at NPR-3 in 1992 because WYDEQ has not issued a permit. Road applications did occur prior to the expiration of the permit; however, there were no formal procedures to implement the road application program to ensure compliance with application, testing, and reporting requirements. For example:

There are no records of the amounts, dates, locations, and sample numbers of the materials applied as required by the permit (I-MM-21);

There are no procedures to obtain a representative sample of fluids to be applied to the road (see Finding WM/CF-2);

There are no procedures to ensure that fluids are tested after every 1,500 barrels of fluids are applied;

There is no inventory of roads that are within 300 feet of the definable high water mark of perennial or intermittent drainages, upon which road application is prohibited;

There is no inventory of roads whose slopes exceed 8 percent, upon which road application is prohibited; and

There are no procedures to determine when soils are saturated and therefore unsuitable for road application.

In addition to the lack of formal procedures to perform road applications, NPOS-R-CUIW did not apply for a permit renewal in a timely manner. NPR-3 is presently accumulating sludges to be road applied if a permit is issued; however, the available storage capacity for this material is limited (WM-32).

The DOE/NPOS-R-CUIW self-assessment (April 1992) and the JBEK self-assessment (April 1992) partially identified this finding. The self-assessments correctly identified the lack of procedures; however, there was no observation that road application had not been conducted in accordance with state requirements.

The apparent causal factors for this finding are inadequate policy and procedures to comply with state requirements and DOE 5480.19. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews to identify areas of noncompliance.
FINDING WM/CF-10: Management of Underground Storage Tanks

Performance Objective

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," states "It is the policy of the Department that the conduct of operations at DOE facilities be managed with a consistent and auditab1e set of requirements, standards, and responsibilities . . . ."

Wyoming Statutes Title 35, Chapter 11, Article 14 (W.S. 35-11-14), "Water Pollution from Underground Storage Tanks Corrective Action Act of 1990," sets forth standards for design, notification, testing, and recordkeeping for underground storage tanks (USTs) in Wyoming.

Code of Colorado Regulations Title 7, Article 14 (7 C.C.R. 14) and 6 C.C.R. 5, "Colorado Underground Storage Tank Regulations," requires an owner or operator of USTs to register each tank with the State Inspector of Oils.

Finding

Underground storage tanks at NPOSR-CUW are not managed in compliance with W.S. 35-11-14, 7 C.C.R. 14, and 6 C.C.R. 5; and formal procedures to ensure compliance with these requirements have not been developed, as required by DOE 5480.19.

Discussion

NPR-3 has records of five USTs onsite. Two of these tanks have been removed and the sites have been closed. The remaining three tanks (a 4,000-gallon diesel tank, a 4,000-gallon unleaded gasoline tank, and a 2,000-gallon unleaded gasoline tank) are located near the maintenance shop and contain fuel for vehicles and equipment. There are no formal procedures to manage these tanks in compliance with state requirements. For example:

- The annual tank registrations, due July 1, 1991, were not filed with the WYDEQ until August 21, 1991 (I-WM-21).

An amended notification for USTs filed in September 1991 (WM-14) indicated that tank tightness testing was last performed January 11, 1991. However, the test results were dated September 11, 1990 (WM-14).

- The tank tightness test results filed with WYDEQ in September 1991 (WM-14) reported tank diameters that differ from the manufacturer specifications kept at NPR-3. These specifications are used to determine fuel filling requirements for the two 4,000-gallon tanks and one 2,000-gallon tank (I-WM-19).

There were no records in the NPR-3 UST files indicating when cathodic protection was installed on the three tanks, as required by W.S. 35-11-1416(a)(vi) (I-WM-21).

In addition to the above issues, the management of USTs at NPR-3 is not formally defined, and roles and responsibilities for compliance activities have not been established (WM-24). There are no written procedures for filling USTs at NPR-3, and the technician responsible for oversight of the filling operation has not received formal spill prevention and response training (I-WM-19). Although inventory records are maintained in the Warehouse, there is no procedure to compare the inventory to fuel use records as a means of leak detection (I-WM-30). Additionally, there are no written procedures to follow in the event of a release from a UST.

Two USTs (capacity unknown) have recently been discovered at NOSR-1. These tanks have not been registered with the Colorado Inspector of Oils, as required by regulation (I-WM-25).

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992). The DOE self-assessment correctly identified the lack of programs but did not identify deficiencies in notification or reporting. This finding was partially identified in the JBEIC self-assessment (April 1992). The JBEIC self-assessment did not identify that UST notifications were not submitted in a timely manner and that maintenance records were not in order.

The apparent causal factors for this finding are inadequate policy and procedures to comply with state regulations and DOE 5480.19. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews to identify areas of noncompliance.
FINDING WM/CF-11: Oversight of Offsite Hazardous Waste Treatment, Storage, and Disposal Facilities

Performance Objective

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), Section 107, establishes that generators of hazardous substances may be considered to be strictly liable for any releases of those hazardous substances from a treatment, storage, or disposal facility.

DOE 5700.6C, "Quality Assurance," Section 9.b(2)(c), requires that "The organization shall ensure that procured items and services meet established requirements and perform as specified" and that "prospective suppliers be evaluated and selected on the basis of specific criteria."

Finding

NPOSR-CUW does not conduct formal evaluations of vendor facilities that treat and/or dispose of hazardous waste generated by NPR-3, NOSR-1, and NOSR-3, in accordance with DOE 5700.6C.

Discussion

NPOSR-CUW has used several commercial facilities to treat and/or dispose of hazardous waste. These facilities are contracted on an as-needed basis by JBEC. The procurement process does not involve a complete assessment of the permit status, compliance history, and other relevant environmental issues associated with the vendor either upon initial contact with the vendor, or through ongoing evaluations of performance (I-WM-18 and I-WM-23). Some, but not all, of the treatment and disposal facilities that received waste from NPOSR-CUW have been assessed; however, the facilities assessed were not evaluated and selected on the basis of specific criteria and observations and findings resulting from these evaluations were not documented.

In accordance with DOE 5700.6C, and due to the potential liability for DOE related to the treatment or disposal of waste, it is required that NPOSR-CUW thoroughly evaluate any facility that receives waste. Such an evaluation would include, but not be limited to, the following:

- Reviewing permit applications, permits, inspection records, and other pertinent documentation;
- Contacting appropriate regulatory agencies to ascertain compliance history and current status;
- Reviewing the adequacy of hazardous waste treatment processes;
- Conducting an inspection or audit of the facility using personnel adequately trained in auditing and formally reporting findings; and
- Evaluating if NPOSR-CUW can comply with waste acceptance criteria required by the facility and the host state.

Some of these practices have been informally implemented by NPOSR-CUW.

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factors for this finding are inadequate policy and procedures to implement an effective offsite vendor evaluation program.
3.5.5 Toxic and Chemical Materials

3.5.5.1 Overview

The toxic and chemical materials portion of the Environmental Subteam assessment evaluated the compliance status of NPR-3, Casper, Wyoming, and NOSR-1 and NOSR-3, Rifle, Colorado, with regard to the Toxic Substances Control Act (TSCA); the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA); the Hazardous Materials Transportation Act (HMTA); DOE Orders; Wyoming and Colorado regulations; NPOSR-CUW policies and administrative memoranda; and best management practices. The use, storage, and disposal of polychlorinated biphenyls (PCBs) and pesticides were compared to regulations promulgated under TSCA and FIFRA, respectively, as well as state requirements. The purchase, receiving, handling, and storage of chemicals were assessed for compliance with DOE Orders, Federal and state regulations, and current industry practices. The regulations, requirements and guidelines used in this assessment are presented in Table 3-7.

The primary focus of the toxic and chemical materials assessment was the activities at NPR-3. There was a review in Casper of NOSR-1 and NOSR-3 documents related to toxic and chemical materials management, and there was a limited assessment of toxic and chemical materials issues by a member of the Environmental Subteam during his field work at NOSR-1 and NOSR-3. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the toxic and chemical materials assessment.

This assessment was accomplished through interviews and discussions with DOE/NPOSR-CUW and contractor personnel and review of policies, procedures, training records, inspection reports, inventories, and audit reports. In addition, physical inspection of field locations, and observation of chemical storage and use activities at tank batteries, steam generating plants, chemical storage areas, the LTS Gas Plant, shop areas, storage yards, and the Water Treatment Facility were conducted.

Responsibility for the management of toxic and chemical materials (TCM) at NPOSR-CUW is shared among the different operating groups at NPR-3 and a single JEBC employee at NOSR-1 and NOSR-3. Each department or operating unit retains primary responsibility for proper management of materials under its control. The environmental, safety and health personnel and individual supervisors, such as the Chemical and Cathodic Protection Coordinator at NPR-3, are knowledgeable about chemicals and provide technical assistance to NPR-3’s operating units. Technical assistance includes management of product material safety data sheets (MSDS), informal training on chemical handling and use, and hazard identification.

Oil-filled electrical equipment in use or in storage at NPR-3 is managed by the Environmental Department with the aid of a senior electrician. Although a formal PCB management program has not been developed, management activities conducted informally include identifying, sampling, and labeling of oil-filled electrical equipment in use or stored for reuse or repair.

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<td>40 CFR 112 Oil Pollution Prevention (CWA)</td>
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<td>40 CFR 165 Regulations for the Acceptance of Certain Pesticides and Recommended Procedures for the Disposal and Storage of Pesticides and Pesticide Containers</td>
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<td>40 CFR 370 Hazardous Chemical Reporting: Community Right-to-Know</td>
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<td>40 CFR 761 Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions</td>
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<td>49 CFR 171, 173, 177, 178, and 397 Transportation of Hazardous Materials, Packaging, Marking, Spill Reporting, etc.</td>
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<td>WYDEQ Rules and Regulations Chapter 4 Wyoming Oil and Hazardous Substances Spills Regulations</td>
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The practice of application and storage of restricted pesticides by employees at NPR-3 has been discontinued. In 1990, environmental staff drafted a pesticide management plan which established that all future pesticide applications be conducted by subcontractors with the exception of GSA spray insecticide and commercial mouse kill bait. Stored excess pesticides and herbicides have been transferred to the local Natrona County Park Service for use on public lands and to NOSR-1 and NOSR-3 in Colorado for onsite use. Currently, pesticides other than small quantities of GSA spray insecticide and commercial mouse kill bait are stored at NPR-3.

NPOSR-CUW procurement of toxic and chemical materials at NPR-3 follows a formal purchase requisition process. Chemical purchases must be approved by a Job Supervisor, the Warehouse Supervisor, and JBEC’s Procurement Department prior to purchase and delivery. Environmental Department personnel do not conduct a formal review of chemical purchase requests for potential hazards or product substitution opportunities prior to procurement. Once chemicals are in stock, JBEC employees can withdraw stock items from the warehouse without a supervisor’s approval. Subcontractors’ use of toxic and chemical materials is primarily governed through the Procurement Department by contract language and informal oversight of subcontractor activities by site supervisors.

Once materials are received at individual NPR-3 locations, TCM management becomes informal. Users and their line management supervisors retain final responsibility for management of TCM. This responsibility includes hazard identification, assessment of potential off-normal situations, proper storage, contractor oversight, and employee training. Much of the training is conducted as part of weekly safety meetings or “on the job” and is not part of a well-documented, formalized program. The Environmental Department at NPR-3 provides technical guidance regarding chemical use; however, this is on an as-needed basis only. NPR-3 does not have consistent, sitewide procedures or policies to integrate the various department responsibilities and activities.

NPR-3 personnel store and use toxic and chemical materials, includingcompatibilities equipment, in warehouses, storage yards, operations areas, shops, and on vehicles. The chemicals are stored in various amounts from shop quantities (spray cans and pails) to bulk storage tanks.

Oil and water treatment chemicals are provided primarily through a contract with Nalco Chemical Corp. Nalco operates, manages, and services “porta-feed” units which provide automatic injection of scale inhibitors, bactericides, H₂S and oxygen scavengers, and demulsifiers to well injection and pumping operations. Most units are entirely automated and hard piped to pumping/injection units, and the chemicals are replenished by Nalco employees. This service constitutes the largest use of toxic and chemical materials at the NPR-3 oil fields and contractor oversight is provided informally by the site Chemical and Cathodic Protection Coordinator. Although JBEC employee contact with the “porta-feed” units is intermittent, some slugging operations require manual operation of the units by site employees.

Warehouse personnel manage stored, excess, and scrap equipment from NPR-3 operations. Equipment stored for individual users or a sitewide pool prior to designation as excess or scrap, are placed in the excess yard or warehouse. Such equipment may contain hazardous materials during storage, excess, or scrap stages at NPR-3.

In response to the 1988 Environmental Survey, the only area in which progress has been noticeably achieved is pesticide management. By choosing to subcontract all future application of restricted pesticides, JBEC has eliminated the need to train and oversee employee activities in this area. The use of GSA spray insecticide and commercial mouse kill bait for spot application by employees at NPR-3 will continue and application of unrestricted pesticides for weed control at NOSR-1 and NOSR-3 will be done by a single individual prior to commencing work on gas wells in those areas.

The environmental issues identified at NOSR-1 and NOSR-3 are significant in that limited action was apparently taken by NPOSR-CUW to address the environmental concerns identified in the 1988 Environmental Survey. Chemicals located at the Anvil Points Mine Bench and the Water Pump House have not been removed or managed in accordance with applicable regulations. Deteriorated asbestos insulation on interior pipes and badly weathered transite siding on and around buildings located on the mine bench remain where they were observed in 1988.

Activities in the area of toxic and chemical materials management at NPOSR-CUW are currently below compliance levels. Programs, policies, and procedures to handle, store, and manage toxic and chemical materials at NPR-3 have not been formalized. The lack of formality of procedures has resulted in fragmented line responsibilities, inconsistent recordkeeping and documentation, and incomplete training or formal instruction for NPR-3 and site support contractors and subcontractors. Chemical use and storage, and PCB management are not in compliance with regulatory requirements while the formality of operations (i.e., policies and procedures) does not conform with the requirements of DOE Orders. Training of contractor personnel is not comprehensive or formalized. In addition, DOE personnel responsible for oversight of the contractors’ activities are not adequately trained to carry out this function.

The toxic and chemical materials assessment identified four compliance findings. These findings address toxic and chemical materials management and storage, storage of toxic and chemical materials, the management of oil-filled equipment and PCBs, and NPOSR-CUW’s Pollution Prevention Awareness Program Plan.
3.5.5.2 Compliance Findings

FINDING TCM/CF-1: Toxic and Chemical Materials Management Program

Performance Objective

DOE 5400.1, "General Environmental Protection Program," states "It is DOE policy to conduct its operations in an environmentally sound manner that limits risks to the environment." Heads of Field Organizations shall "develop and implement programs that direct contractors to execute environmental protection compliance programs and policies and provide for oversight, confirmation, and independent verification of those contractor programs."

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," requires that "the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities and that . . . Operators at DOE facilities have procedures in place to control the conduct of their operations."

DOE 5480.19, Attachment 1, Chapter VIII, states "Operators should be knowledgeable about aspects of facility processes and safety that affect operation and should be able to analyze off-normal situations and take appropriate action to correct the cause(s) of problems." Examples of the types of concepts and processes with which operations personnel should be familiar include: "The purpose and hazards associated with facility storage and use of such chemicals as . . . acids, caustics, . . . and chemicals containing organics."

29 CFR 1910.1450, "National Research Council Recommendations Concerning Chemical Hygiene in Laboratories (non-mandatory)," Section D.2(a), states "before a substance is received, information on proper handling, storage, and disposal should be known to those who will be involved." Section D.9(c), states that a spill control policy should be developed and should include consideration of prevention, containment, cleanup, and reporting.

Finding

NPOSR-CUW does not have a comprehensive sitewide program that manages the procurement, receipt, tracking, handling, and response to releases of toxic and chemical materials to ensure compliance with DOE 5400.1, DOE 5480.19, and 29 CFR 1910.1450.

Discussion

Comprehensive management of toxic and chemical materials (TCM) must incorporate and integrate aspects of project planning, procurement, receipt, tracking, handling, storage, spill response, and use. Management systems for hazard identification and oversight by contractors and DOE should ensure compliance and minimize potential releases to the environment.

NPOSR-CUW lacks the elements of a comprehensive system to manage TCM. Specific elements not available include: formal procedures to oversee chemical material use by subcontractors onsite; a system for environmental reviews of purchase requests to ensure that procured materials will not result in environmental concerns; and procedures to govern the inventory and tracking of chemical use onsite. In addition, TCM hazard identification and spill response training is informal and documentation is incomplete. The following are examples of specific programmatic deficiencies.

Contractor/Subcontractor Oversight

NPOSR-CUW does not have formalized procedures for overseeing chemical use by subcontractors and contractors (I-TCM-1 and I-TCM-24). A systematic hazard review of chemicals used by JBEC during maintenance, water treatment, and oil testing activities is not formally conducted by environmental personnel. Also, tracking of the types and quantities of chemicals such as lubricants, equipment maintenance products, and downhole materials is inconsistently conducted because there are no procedures. DOE surveillance of JBEC field activities does not include evaluation of the use, storage, and tracking of chemicals (I-TCM-30).

The most significant use of chemicals in the field is accomplished by "porta-feed" units supplied and maintained by Nalco Corp. These chemicals are used for the treatment of crude oil and produced water and include biocides, scale inhibitors, hydrogen sulfide and oxygen scavengers, oil demulsifiers, and chemicals for adjusting pH. Although a Nalco representative services and replenishes the "porta-feed" units weekly, and a JBEC employee observes this activity, a formal procedure for conducting this oversight has not been developed (I-TCM-1).

Procurement

Chemical procurement at NPOSR-CUW follows a written procedure that requires a material requestor to complete a purchase request form (I-TCM-1). This request form must receive a job order supervisor's signature and be approved by warehouse and procurement staff prior to chemical purchase. Although a formal procedure exists for procurement of materials (TCM-17), there are no provisions that require environmental review of requested materials to evaluate the environmental concerns or potential substitutions of these materials. The written procedure also does not require material safety data sheets (MSDSs) to be obtained prior to receipt and distribution of chemicals onsite. These areas are inspected at NPOSR-CUW field sites (the electrical shop, maintenance shop, and Steam Generator No. 1) did not have MSDSs for several of the chemical products used and stored in these areas. Some examples of these products include: methanol, Misty Choke and Carburetor Cleaner, CRC Cutting Oil, Johnson Over and Under Floor Cleaner and Mackinlaburn Duncan Contact Cement (I-TCM-2, I-TCM-9 and I-TCM-21).

Department supervisors have drafted lists of chemicals for which MSDSs are not available. However, a process to expedite procurement of the data sheets has not been formalized (TCM-13 and TCM-15). Currently, informal responsibility for acquiring needed MSDSs is shared among environmental personnel, safety and health personnel, department supervisors, and the JBEC Procurement Department. Over 35 chemical products, for which the site does not have MSDSs, are currently in use throughout NPOSR.

Inventory/Tracking

A comprehensive inventory of all TCM used onsite is not maintained. In addition, individual chemical use areas, such as shops, the Water Treatment
Facility, and the Warehouse do not maintain an inventory of the types and amounts of chemicals in storage or in use. Stock chemical products stored at the Warehouse at NPR-3 can be withdrawn from stock by employees without a supervisor’s approval, and a system is not in place to ensure that an MSDS accompanies any chemical received and used in the field.

**TCM Hazard Identification and Spill Response Training**

General hazard communication training per 29 CFR 1910.1200 is provided to all NPOSR-CUW employees as part of a routine orientation program. This training is not job-specific with regard to hazards associated with chemicals employees will be handling as part of their individual job responsibilities.

NPOSR-CUW lacks a formal comprehensive chemical awareness training program. Training regarding TCM is currently conducted at weekly departmental safety meetings and consists primarily of a review of information available on specific chemical MSDSs. Although weekly safety meeting attendance is documented, course outlines and syllabuses are not prepared. Should any employee miss a safety meeting, provisions do not exist to ensure that material covered is reviewed and understood by that employee. The following examples indicate the lack of comprehensive training regarding TCM:

A pumper at the Tensleep Tank Battery was not familiar with the safety hazards associated with Na1co 4818 (I-TCM-17).

A pumper at the B-1-10 Tank Battery was not familiar with the safety hazards associated with Solvent 140 (I-TCM-18). This operator was also not aware of training requirements for her job.

**Spill Response Training**

NPOSR-CUW has prepared an SPCC plan to minimize the effects of spilled oil at NPR-3; however, this plan does not address the release of toxic and chemical materials including oil from oil-filled equipment at NPR-3 or NOSR-1 and NOSR-3 (TCM-18) (see Finding TCM/CF-3).

Oil spill response training is formally conducted at NPOSR-CUW; however, chemical spill response training is not. Chemical spill response training is conducted informally at weekly safety meetings and consists primarily of a supervisor’s review of spill response procedures outlined in chemical product MSDSs. JBECS employees working in areas where chemicals are widely used, including the LTS Gas Plant, tank batteries, the Water Treatment Facility, shops, and steam generating plants, have not received formal spill response training and procedures for chemical spill response have not been developed.

Specific examples that indicate the site has not developed an integrated sitewide spill response program for TCM are as follows:

The chemical truck driver has received 40 hours of hazardous materials training offsite; however, the truck which transports chemicals to many locations throughout the NPR-3 oil field is not equipped with spill response equipment (I-TCM-10).

Written job descriptions indicating required training for all positions that use and handle TCM have not been developed (I-TCM-20).

Procedures for conducting water treatment tests at the Water Treatment Facility and steam generators, and grind-out tests at tank batteries are informal and do not address the hazards and spill response techniques associated with TCM use.

Newly acquired spill response kits are located in several locations throughout the NPR-3 site including the Water Treatment Facility and steam generating plants; however, training on use of this equipment has not been conducted (I-TCM-21 and I-TCM-8).

The apparent causal factors for this finding are training, in that NPOSR-CUW personnel handling TCM are not formally trained regarding the hazards associated with chemical use or in spill response procedures required to adequately minimize the effects of spilled hazardous materials to the environment; and the lack of procedures for use and handling of TCM and responding to TCM releases while conducting these activities.
FINDING TCM/CF-2: Storage of Toxic and Chemical Materials

Performance Objectives

DOE 5400.1, "General Environmental Protection Program," requires DOE facilities to conduct operations in an environmentally sound manner that limits risks to the environment and to develop and implement programs to execute environmental protection compliance programs and policies.

DOE 5400.19, "Conduct of Operation Requirements for DOE Facilities," Attachment I, Chapter VIII, states "Operators should be knowledgeable about aspects of facility processes and safety that affect operation and should be able to analyze off-normal situations and take appropriate action to correct the cause(s) of problems." Examples of the types of concepts and processes with which operations personnel should be familiar include: "The purpose and hazards associated with facility storage and use of such chemicals . . . acids, caustics, . . . and chemicals containing organics."

29 CFR 1910 establishes requirements for the handling and storage of toxic and chemical materials. 29 CFR 1910.106(b)(2)(vii) requires that "the area surrounding a group of tanks shall be provided with drainage, or shall be diked, to prevent accidental discharge of liquid from endangering adjoining property or reaching waterways."

29 CFR 1910.1450, "National Research Council Recommendations Concerning Chemical Hygiene in Laboratories (non-mandatory)." Section D.2.(b), suggests that toxic substances should be segregated in a well identified area . . . It also suggests that "Stored chemicals should be examined periodically (at least annually) for replacement, deterioration, and container integrity."

Finding

NPOS-CUW does not have formal procedures to identify, segregate, label, and manage toxic and chemical materials as required by DOE 5400.19 and 29 CFR 1910.

Discussion

NPR-3 personnel store and use toxic and chemical materials, including compressed gases, in warehouses, storage yards, operations areas, shops, and on vehicles. The chemicals are stored in various amounts from shop quantities (spray cans and pails) to bulk storage tanks.

Storage practices for toxic and chemical materials at facilities operated by JBEC at NPR-3 vary. Instances were observed where incompatible materials at NPR-3 were not segregated and several containers were observed improperly labeled or not labeled. The lack of comprehensive, formal procedures to ensure consistent hazard identification, labeling, segregation, and storage of TCM at NPOS-CUW sites increases the potential for releasing chemicals to the environment.

The following deficiencies in meeting DOE and regulatory requirements were observed:

Incompatible materials were stored together in the following locations:

- Bleach (oxidizer) and an organic combustible deodorizer were stored together on a shelf at the Warehouse and under a sink at the Water Treatment Facility (I-TCM-4 and I-TCM-8).
- Quart bottles of 5.25 Normal (N) sulfuric acid and 5.0N sodium hydroxide were stored together at the Water Treatment Facility and at Steam Generator No. 1 (I-TCM-21 and I-TCM-8).

Containers were found mislabeled or unlabeled in the following locations:

- A 55-gallon drum of oil located at the Warehouse Storage Yard was not labeled such that the identifying markings could be easily seen (I-TCM-3).
- A 55-gallon drum and a 5-gallon pail at the Chemical Dock Area were not labeled (I-TCM-10).
- A 5-gallon can containing Solvent 140, located outside the Dog House at Tank Battery B-1-3, was marked only with the word "solvent," which did not describe the actual contents of the can (I-TCM-19).
- The contents of a 1-quart bottle located at the Water Treatment Facility could not be determined due to a damaged label. JBEC personnel indicated that the bottle contained 5.25N sulfuric acid; however, this was not confirmed (I-TCM-8).
- An oxygen test kit unit located at Steam Generator No. 1 contained a hydrochloric acid solution (Fyrite) which was not labeled (I-TCM-21).
- Two 30,000-gallon liquid butane/gasoline (BG Mix) pressure tanks located at the LTS Gas Plant were not marked to identify the contents (I-TCM-29).
- Two 55-gallon drums of water treatment chemicals located at the LTS Gas Plant were not marked for their contents; however, National Fire Protection Association (NFPA) hazard warnings were affixed (I-TCM-14).

The secondary containment structure shared by two methanol tanks and one ethylene glycol tank at the LTS Gas Plant is inadequate to prevent the discharge of methanol to the environment as required by 29 CFR 1910.106. The 1,000-gallon methanol tank is positioned too close to the perimeter, and associated piping extends beyond the perimeter of the containment. Product from this tank and piping has the potential to be discharged outside the containment.
A box of empty propane cylinders was found on the floor near the garage door in the NPR-3 Warehouse. "Empty" propane cylinders may contain some residual product under pressure, and their present location creates the potential to damage the valves or puncture the cylinders and release propane (I-TCM-4).

A 55-gallon drum of Solvent 140 located on a stand at Tank Battery B-I-10 was not properly seated in the stand. The stand was rusted and a weld was broken (I-TCM-18).

In 1988, an environmental survey conducted at NOSR-1 and NOSR-3 discovered various maintenance chemicals abandoned in place (TCM-19). The Environmental Subteam observed these same chemicals, including hydraulic fluid and paints, stored at the Anvil Points Mine (I-SW-9). These chemicals have not been evaluated for use or disposal since the 1988 Environmental Survey.

NPOSR-CUW has not developed formal procedures for inspecting and decontaminating equipment which comes into the Warehouse Yard prior to its being scrapped. Metal scrap (pipe joints and valves) is collected in a dumpster box in the Warehouse Yard. Much of this material appears to contain scale and deposits (I-TCM-3).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factors for this finding are inadequate policy implementation of existing DOE Orders and regulatory guidelines; insufficient training of NPOSR-CUW personnel; inadequate design of the secondary containment structure for the methanol and ethylene glycol tanks; and inadequate supervision to ensure compliance with DOE Orders. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews by NPOSR-CUW for not identifying and correcting the deficiencies in current TCM identification, storage, segregation, and labeling practices.

FINDING TCM/CF-3: Management of Oil-Filled Equipment and Polychlorinated Biphenyls

Performance Objective

DOE 5400.1, "General Environmental Protection Program," states "It is DOE policy to conduct the Department's operations in compliance with the letter and spirit of the applicable environmental statutes, regulations, and standards." In addition, DOE is committed to good governmental management of all its programs and at all its facilities to correct existing environmental problems, to minimize risks to the environment or public health, and to anticipate and address potential environmental problems before they pose a threat to the quality of the environment or the public welfare.

DOE 6430.1A, "General Design Criteria," 1630-2.3.5, "Oil-Filled Equipment," states that for oil-filled equipment "Dikes and drainage provisions shall be built as required by the local SPCC Plan in accordance with 40 CFR 112." It also states "Existing PCB or PCB-contaminated equipment shall be provided with warning signs and shall not be relocated or reused in other existing or new facilities."

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," requires that "the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities and that operators at DOE facilities have procedures in place to control the conduct of their operations."

40 CFR 761, "Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions," establishes prohibitions of, and requirements for the manufacture, processing, and distribution in commerce, use, disposal, storage, and marking of PCBs and PCB items." 40 CFR 761.3 states "Oil-filled Electrical Equipment . . . whose PCB concentration is not known must be assumed to be PCB-Contaminated."

40 CFR 112.7(c), "Guidelines for the preparation and implementation of a Spill Prevention Control and Countermeasure Plan," states "Appropriate containment and/or diversionary structures or equipment to prevent discharged oil from reaching a navigable water course should be provided."

Finding

NPOSR-CUW lacks a comprehensive set of procedures to manage PCBs to ensure compliance with DOE Orders, 40 CFR 761, and 40 CFR 112.7.

Discussion

In the early to mid-1980s, transformers were surveyed at NPR-3 to identify and dispose of PCBs in order to comply with recently promulgated regulations. Since that time, management of oil-filled electrical equipment (primarily transformers) has not progressed significantly, and data collected during previous surveys are incomplete and inconclusive regarding the amount of PCB-contaminated equipment onsite (I-TCM-15).
NPR-3 utilizes and stores oil-filled equipment in the form of pole mounted transformers, pad transformers, and capacitors. However, a formal program to manage this equipment has not been developed.

The following observations indicate deficiencies in the management of oil-filled equipment at NPR-3:

An accurate inventory of oil-filled equipment and tracking of this equipment has not been developed per 40 CFR 761.180(iv). Due to incomplete records of analyses and test results from a previous transformer sampling event, the total number of PCB-contaminated devices onsite is not known (I-TCM-15 and I-TCM-28).

- A pole mounted transformer at location 12-N-10, which was believed to be PCB-contaminated, was not labeled as such. The transformer was either changed, and its whereabouts unknown, or it was mislabeled (I-TCM-28).

- A pole mounted metering station that belongs to Pacific Power and Light (PP&L) contains several small transformers. The site does not know if these transformers contain PCB-contaminated oil (I-TCM-28).

Existing PCB documentation including transformer locations and manufacturers' certification for non-PCB fluids is not organized, and lab analysis required to substantiate test results for many of the transformers is not available. JBEC personnel responsible for managing oil-filled equipment cannot confirm with supporting analytical data the PCB-concentration of 9 out of 33 transformers stored in the Excess and Pipe yards. These transformers are not managed as PCB-contaminated, as required by 40 CFR 761.3, which states that any oil-filled transformer whose PCB concentration is not known must be assumed to be PCB-contaminated (I-TCM-15).

- Oil-filled equipment storage areas in the Excess and Pipe Yards do not meet the requirements for spill containment in 40 CFR 112.7(c) as referenced by DOE 6430.1A.

- The nine transformers have exceeded the 1-year storage requirement of 40 CFR 761.65(a).

- The nine transformers do not contain warning signs required by DOE 6430.1A (I-TCM-15 and I-TCM-11).

- The nine transformers are not dated to indicate the day on which storage began per 40 CFR 761.65(b)(8).

Procedures for proper PCB transformer decontamination and retrofitting, as defined in 40 CFR 761.79, have not been developed (I-TCM-15 and I-TCM-3).

The site has not developed specific spill response procedures for PCB-contaminated oil nor addressed the spillage and subsequent cleanup of PCB-contaminated oils in its SPCC Plan (TCM-18).

The listed deficiencies support the concern that NPOSR-CUW does not have programs in place to ensure that PCB management meets the DOE requirements and Federal regulations. In addition, compliance with regulations is hampered because the site personnel responsible for the management of oil-filled equipment are not trained or familiar with the PCB regulatory requirements of 40 CFR 761 (I-TCM-2, I-TCM-15, and I-TCM-28).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) partially identified this finding in that each of the self-assessments failed to identify specific deficiencies in this area.

The apparent causal factors for this finding are inadequate policy implementation of PCB management requirements; sitewide and functional group procedures which do not address regulatory requirements; and insufficient training of environmental and other NPOSR-CUW personnel in complaint regulatory practices and recordkeeping.
FINDING TCM/CF-4:  Pollution Prevention Awareness Program Plan

Performance Objective

DOE 5400.1, "General Environmental Protection Program," establishes DOE policy on environmental protection. Chapter III.4.c requires the Head of Field Organization to prepare a Pollution Prevention Awareness Program Plan (PPAPP) that includes elements for employee awareness. "All mission statements and project plans shall recognize a requirement for pollution prevention, where appropriate. The documented program, including elements for employee awareness through specific training ... campaigns, and incentives and awards programs shall be implemented." The plan was to be implemented by November 9, 1989.

Finding

NPOS-R-CUW's PPAPP does not meet the requirements of DOE 5400.1, Chapter III, and the pollution prevention awareness program has not been implemented.

Discussion

NPOS-R-CUW has drafted a PPAPP. The plan was completed and approved by the Director of NPOS-R-CUW in December 1989. However, the plan was not completed prior to the November 1989 deadline and, to date, has not been formally implemented.

The PPAPP consists of a two-page outline of issues to be addressed and actions to be taken by specific dates. However, some elements of the PPAPP required by DOE 5400.1 are not addressed. The specific elements not addressed include: providing for pollution prevention in mission statements and project plans, specific training, and related employee awareness campaigns and incentives (TCM-6). Comprehensive, formalized training programs specific to pollution prevention for subcontractors, contractor, management, and field employees have not been established or implemented.

The DOE/NPOS-R-CUW's self-assessment (April 1992) and the JBEF self-assessment (April 1992) fully identified this finding.

The apparent causal factor for this finding is a lack of policy implementation concerning PPAPP elements as required by DOE 5400.1. A secondary contributing factor for this finding is the lack of appraisals/audits/reviews by DOE/NPOS-R-CUW to effectively oversee implementation of this requirement.
Quality Assurance

Overview

The quality assurance (QA) portion of the Environmental Subteam assessment at NPOSR-CUW evaluated current operational practices and programs to determine the compliance status with Federal regulations and DOE Orders, as well as commonly accepted industry QA practices and standards of performance. Table 3-8 lists environmental quality assurance regulations, DOE Orders, and guidelines that were used during this assessment.

The primary focus of the quality assurance assessment was the activities at NPR-3. There was a review in Casper of NOSR-I and NOSR-3 documents related to environmental quality assurance, and there was an assessment of quality assurance associated with groundwater and surface water sampling events observed by a member of the Environmental Subteam during his field work at NOSR-1 and NOSR-3. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the quality assurance assessment.

The environmental quality assurance assessment included interviews with NPOSR-CUW and contract laboratory employees; inspection of NPOSR-CUW facilities, leased records archives, and contract laboratories; observation of environmental sampling and analysis activities; and a review of documents, procedures, and records associated with environmental monitoring and surveillance programs.

As a part of the quality assurance assessment, reviews were coordinated with other Environmental Subteam specialists in the areas of soils, sediments, and biota; groundwater; surface water; air, radiation; and waste management to ensure that potential environmental monitoring and surveillance QA problems were identified and evaluated.

Within DOE/NPOSR-CUW, development and implementation of a quality assurance program (QAP) that meets the requirements of DOE 5700.6C is normally the responsibility of the QA Officer. However, responsibilities for evaluating the quality of environmental monitoring and surveillance operations are primarily intradepartmental as are quality assessments and audits. Individuals responsible for oversight, monitoring, verification, and development of performance standards do not have sufficient independence and authority to conduct activities and resolve issues.

NPOSR-CUW has neither an approved Environmental Monitoring Program nor QAP that meets the requirements of DOE Orders. At the time of this assessment, a QAP document based on the requirements of DOE 5400.1, DOE 5700.6C, and ASME NQA-1 has been prepared and submitted to FE-I for approval. In addition, a self-assessment program document has been approved by FE-I. However, NPOSR-CUW has not allocated resources to implement the program.

NPOSR-CUW has not developed and implemented many of the plans and programs required by DOE 5400.1. An Environmental Monitoring Plan and Groundwater Protection Management Plan have not been developed. The Pollution Prevention Awareness Program Plan and Waste Minimization Program Plan have been developed, but not implemented.

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</table>
Other required plans and programs that have been implemented lack the required formality to ensure compliance with DOE 5400.1 requirements. Of further concern is the lack of a system within NPOSR-CUW to translate regulations and DOE requirements into formal policies, standards, and procedures.

As a result of the lack of policy implementation, environmental monitoring and surveillance operations at NPOSR-CUW are conducted without attention to proper procedure by personnel who lack the training or who are otherwise unqualified to perform the assigned tasks. Insufficient attention is paid to the assessment of quality of completed work, periodic monitoring of work-in-progress, and oversight of subcontractors by means of internal audits.

Within JBEC operations, QA is the responsibility of the Quality Management Coordinator who was assigned the responsibility to coordinate the development and implementation of a QAP to bring JBEC into compliance with DOE 5700.6C. Prior to the appointment of the Quality Management Coordinator in March 1992, JBEC had no QA organization that conducted independent monitoring of environmental quality-related issues and reported problems to management for resolution. Responsibilities for evaluating the quality of environmental monitoring and surveillance operations were primarily intradepartmental as were quality assessments and audits.

The 1988 Environmental Survey recorded one environmental quality assurance finding: there were no written procedures for National Pollutant Discharge Elimination System (NPDES) sampling. No corrective action has been taken to address this finding.

The present environmental monitoring and surveillance activities do not meet DOE requirements for quality assurance and data verification necessary to minimize risks and environmental impacts. The recent JBEC decision to implement a total quality management program and to hire a Quality Management Coordinator has led to the production of a QAP manual and a self-assessment program manual for JBEC that, when fully implemented, will meet DOE requirements for environmental monitoring and surveillance.

The quality assurance portion of the Environmental Subteam assessment identified 12 compliance findings. The findings pertain to environmental monitoring programs, formality of environmental programs, management of the environmental QAP, environmental operating procedures, training of environmental personnel, QA independence, internal QA audits, environmental data validation, records management, standards and calibration, chain-of-custody, and procurement of analytical services.

### 3.5.6.2 Compliance Findings

**FINDING QA/CF-1:** Environmental Monitoring Programs and Annual Site Environmental Report

**Performance Objective**

DOE 5400.1, "General Environmental Protection Program," Chapter III, requires DOE operations to develop and implement specific environmental programs.

DOE 5400.1, Chapter IV, requires that a written Environmental Monitoring Plan be prepared for each site, by November 9, 1991.

DOE 5400.1, Chapter III (2.a-d), requires that an Environmental Protection Implementation Plan be prepared for implementing the requirements of the Order. The plan is to provide management direction, including assignment of responsibilities and authorities, to ensure that DOE facilities are operated and managed in a manner to comply with environmental regulations and DOE policies.

DOE 5400.1, Chapter III (3.a), requires the development of a Long Range Environmental Protection Plan.

DOE 5400.1, Chapter III (4.a), requires the preparation of a Groundwater Protection Management Program Plan that includes specified elements listed in the Order.

Office of Environmental Compliance Division (EH-22) Final Guidance for the Preparation of Site Environmental Reports for Calendar Year 1991, requires final Site Environmental Reports to be submitted to EH-I by June 1, 1992.

**Finding**

NPOSR-CUW environmental monitoring programs, reports, and plans do not fully meet the requirements of DOE 5400.1 and DOE Headquarters guidance.

**Discussion**

The Environmental Subteam reviewed environmental monitoring programs and plans to determine if they meet the intent and spirit of DOE 5400.1. These programs and plans are used to help ensure compliance with legal and regulatory requirements, confirm adherence to DOE environmental protection policies, and support environmental management decisions. The Environmental Subteam identified the following deficiencies during this review:

The Environmental Protection Implementation Plan (EPIP) appears to contain errors. The EPIP states that a formal Groundwater Protection Management Plan was developed and reviewed by DOE/NPOSR-CUW. However, this plan does not exist, and DOE/NPOSR-CUW has not reviewed any drafts of this plan (R-13: 1-R-10) (see Finding QA/CF-1).

An Environmental Monitoring Plan has not been developed for NPOSR-CUW, as required by DOE 5400.1 (R-13).
The 1991 Annual Site Environmental Monitoring Report was not sent to EH-1 by June 1, 1992, as required by DOE Headquarters guidance.

A Pollution Prevention Awareness Program Plan has been developed, but it does not meet the requirements of DOE 5400.1 (see Finding TCM/CF-4).

A Waste Minimization Program Plan has been developed, but it does not meet the requirements of DOE 5400.1 and has not been implemented. This plan was required to be implemented by May 9, 1990, by DOE 5400.1 (see Finding WM/CF-1).

There are no procedures for surveillance and monitoring of surface waters, as required by DOE 5400.1 (1-SW-5).

A Groundwater Monitoring Plan has not been developed, as required by DOE 5400.1 (see Finding GW/CF-1).

Air and meteorological monitoring programs have not been developed, as required by DOE 5400.1 (see Findings A/CF-2 and A/CF-3).

The apparent causal factor for this finding is policy implementation, in that DOE policy has not been implemented by NPOSR-CUW.

**Finding QA/CF-2: Formality of Environmental Programs**

**Performance Objective**

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," provides requirements and guidelines for the development of directives, plans, and procedures relating to the conduct of operations. This Order states that it is the policy of DOE that the conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities. The policy statement also addresses the use of procedures to control conduct of operations, review of programs, and assessment of program effectiveness.

DOE 5700.6C, "Quality Assurance," Criterion 4, "Document and Records," states "Documents shall be prepared, reviewed, approved, issued and revised to prescribe processes, specify requirements or establish design."

DOE 5700.6C, Criterion 5, "Document and Records," states "Work shall be performed to establish technical standards and administrative controls" and "Work shall be performed under controlled conditions using approved instructions, procedures, or other appropriate processes."

**Finding**

NPOSR-CUW environmental protection activities are not conducted in accordance with formal programs supported by controlled documentation, as required by DOE 5480.19 and 5700.6C.

**Discussion**

NPOSR-CUW environmental programs are striving to achieve compliance with regulatory requirements and DOE Orders. There are many informal practices, procedures, and policies that sometimes are helping this process, but in most cases hinder this effort. The Environmental Subteam observed the following concerns with these informal programs:

A formal system is not in place to identify and translate regulations and DOE Orders into policies, standards, and procedures. The Environmental Subteam identified many Orders, such as DOE 5400.5 and DOE 5820.2A, that have not been reviewed and transmitted by DOE/NPOSR-CUW. Some of these Orders have not been acted on for over 2 years (I-R-10).

There is no system in place to ensure that subcontractors will follow DOE environmental Orders (I-R-1 and I-R-4) (see Finding RAD/CF-2). Although there are informal reviews of subcontractor procedures, there are no formal requirements and review specifications to evaluate procedures.

Subcontractors do not have policies and procedures that are part of a formal, auditable document control system (I-R-11) (see Finding QA/CF-12).

A review system is not in place to ensure that JBEI procedures address all activities necessary to implement environmental monitoring programs.
policies, are technically correct and current, and have a level of
detail appropriate for the activities to which they apply (I-R-9).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment
(April 1992) fully identified this finding.

The apparent causal factor for this finding is a lack of policy implementation
to ensure that the requirements of DOE 5480.19 are met.

FINDING QA/CF-3:  Environmental Quality Assurance Program

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section
10.a, states "A quality assurance program consistent with DOE 5700.6B
(superseded by DOE 5700.6C) shall be established covering each element of
environmental monitoring and surveillance programs commensurate with its
nature and complexity. The quality assurance program shall include, but not
be limited to, the following: (1) Organizational responsibility; (2) Program
design; (3) Procedures; (4) Field quality control; (5) Laboratory quality
control; (6) Human factors; (7) Recordkeeping; (8) Chain-of-custody
procedures; (9) Audits; (10) Performance reporting; and (11) Independent Data
verification.

DOE 5700.6C, "Quality Assurance," Section 9.b, requires the development of a
quality assurance program based on the following 10 criteria: program,
personnel training and qualification, quality improvement, documents and
records, work processes, design, procurement, inspection and acceptance
testing, management assessment, and independent assessment.

Finding

NPOSR-CUW has not implemented an environmental quality assurance program that
meets the requirements of DOE 5400.1 and DOE 5700.6C.

Discussion

The Environmental Subteam reviewed environmental quality assurance programs
and plans to determine if the programs and plans meet the intent and spirit of
DOE 5400.1. During this review, the Environmental Subteam identified the
following deficiencies:

JBEC does not have an approved and implemented Environmental
Quality Assurance Program and Implementation Plan (I-QA-3). However,
a plan that meets the requirements of DOE Orders has
recently been prepared and submitted by the site to DOE
Headquarters for approval (QA-28 and QA-32).

DOE/NPOSR-CUW does not have an approved and implemented
Environmental Quality Assurance Program and Implementation Plan
(I-QA-10). However, a plan that meets the requirements of DOE
Orders has been prepared and submitted for approval to DOE
Headquarters (QA-26 and QA-27).

There is no system in place to ensure the quality of environmental
analytical services procured from subcontractors (I-QA-3, I-QA-7,
and I-QA-8) (see Finding QA/CF-12).

There is no system in place to ensure that environmental
monitoring tasks are assigned to and conducted by qualified
personnel (I-QA-1 and I-QA-8) (see Finding QA/CF-5).
The DOE/NPOS-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factors for this finding are policy implementation and risk evaluation, in that DOE Orders have not been implemented by the site and the site did not evaluate the risk associated with an unapproved and unimplemented quality assurance program.
FINDING QA/CF-4: Environmental Operating Procedures

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 10.a, states "a quality assurance program consistent with DOE 5700.6B [superseded by DOE 5700.6C] shall be established covering each element of environmental monitoring and surveillance programs." This Order further requires development and implementation of procedures, field quality control, laboratory quality control, recordkeeping, chain-of-custody procedures, and independent data verification.

DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," requires "that conduct of operations at DOE facilities be managed with a consistent and auditable set of requirements, standards, and responsibilities."

DOE 5700.6C, "Quality Assurance," Section 9.b(2)(a), states "work shall be performed under controlled conditions using approved instructions, procedures, or other appropriate means."

DOE 5700.6C, Attachment I, Page 2, Paragraph 2, states "Program developed and properly implemented using ASME/NQA-1 will meet the majority of requirements of this Order." DOE/NPOSR-CUW Quality Assurance Program Manual (March 1992) preamble states, "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1." JBEC Quality Assurance Program Manual (April 1992), Number ii, states, "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1 to maintain consistency with DOE at NPOSR-CUW."

ASME NQA-1, Basic Requirement 5, "Instructions, Procedures, and Drawings," states "activities affecting quality shall be prescribed in and performed in accordance with documented instructions, procedures, or drawings of a type appropriate to the circumstances." Basic Requirement 6, "Document Control," states "preparation, issue, and change of documents that specify quality requirements or prescribed activities affecting quality shall be controlled to ensure that correct documents are being employed. Such documents, including changes thereto, shall be reviewed for adequacy and approved for release by authorized personnel."

Finding

Operations at NPOSR-CUW in support of environmental monitoring and surveillance are not conducted using approved procedures as required by DOE 5400.1, DOE 5480.19, DOE 5700.6C, and NPOSR-CUW quality assurance program manuals.

Discussion

Controlled operating procedures are a mechanism that can ensure that operations are conducted in accordance with regulatory requirements. They are the functional implementation of environmental policy. The use of approved procedures ensures that environmental activities are performed in a uniform, consistent, and auditable manner. The present NPOSR-CUW systems for procedure control, including preparation, review, revision, and approval, have not been consistently implemented. As a result, environmental operations at NPOSR-CUW are not routinely performed in conjunction with approved written procedures.

Operations noted by the Environmental Subteam that are conducted without the benefit of approved written procedures include, but are not limited to, the following examples:

NPOSR-CUW personnel, observed taking groundwater and surface water environmental samples at NQSR-3, had no written operating procedures for preparing, operating, cleaning, or decontaminating sampling equipment; taking and preserving samples; or instituting and maintaining a chain-of-custody. There were no approved written procedures for monitoring H2S concentrations in ambient air at NPR-3. The JBEC air specialist had prepared, and was using, a draft procedure (QA-11; I-QA-4). Procedures, or changes thereto, should not be implemented until approved.

NPOSR-CUW personnel, observed taking National Pollutant Discharge Elimination System (NPDES) surface water samples at NQSR-3, had no approved written operating procedures for preparing, operating, cleaning, or decontaminating sampling equipment; taking and preserving samples; or instituting and maintaining a chain-of-custody. There were no approved written procedures for the use and maintenance of equipment used to measure pH and conductivity of NPDES samples (I-QA-14) (see Finding SW/CF-1).

NPOSR-CUW personnel, observed sampling potable water at NPR-3, had no approved written operating procedures. Procedures provided by the Natrona County Health Department laboratory and others were available but not followed (QA-35). Lines were inadequately flushed. Aerators on three out of five sampling points were frozen by scale and could not be removed. Sampling personnel were unaware that attachments such as aerators should be removed prior to sampling (I-QA-12).

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992) and partially identified in the JBEC self-assessment (April 1992). Each of the self-assessments failed to identify specific deficiencies in preparation and implementation of environmental monitoring and surveillance operating procedures.

The apparent causal factor for this finding is a lack of policy implementation, in that NPOSR-CUW has not implemented an effective environmental quality assurance program.
FINDING QA/CF-5: Training of Environmental Personnel

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 10.a, states "a quality assurance program consistent with DOE 5700.6C shall be established covering each element of environmental monitoring and surveillance programs." This Order further requires development and implementation of procedures, field quality control, laboratory quality control, recordkeeping, chain-of-custody procedures, and independent data verification.

DOE 5700.6C, "Quality Assurance," Section 9.b(l)(b), Criterion 2, "Personnel Training and Qualification," states "personnel shall be trained and qualified to ensure that they are capable of performing their assigned work. Personnel shall be provided continuing training to ensure that job proficiency is maintained."

DOE 5700.6C, Attachment 1, Page 2, Paragraph 2, states "Programs developed and properly implemented using ASME/NQA-1 will meet the majority of requirements of this Order." DOE/NPOSR-CUM Quality Assurance Program Manual (March 1992) preamble states "This manual is also designed to meet the requirements of ANSI/ASME NQA-1." JBIQ Quality Assurance Program Manual (April 1992), Number 11, states "This manual is also designed to meet the requirements of ANSI/ASME NQA-1 to maintain consistency with DOE at NPOSR-CUM."

ASME NQA-1, Basic Requirement 2, "Quality Assurance Program," states "the QA Program shall provide for indoctrination and training, as necessary, of personnel performing activities affecting quality to ensure that suitable proficiency is achieved and maintained."

Finding

NPOSR-CUM personnel performing environmental sampling and field measurements are not provided adequate training to ensure that quality assurance objectives are maintained while performing their duties, as required by DOE 5400.1, DOE 5700.6C, and NPOSR-CUM quality assurance program manuals.

Discussion

To carry out DOE policy, personnel who perform functions vital to the generation, maintenance, and preservation of defensible environmental data must know and understand environmental quality assurance requirements. Some NPOSR-CUM personnel do not have the formal education or training to fully understand the requirements and responsibilities of their job assignments. Deficiencies in training across NPOSR-CUM noted by the Environmental Subteam include, but are not limited to, the following examples:

NPOSR-CUM personnel observed taking environmental samples:

- Were not familiar with some requirements that are necessary to maintain defensibility of data (e.g., the need to document all steps in the sampling process) (I-QA-1, I-QA-4, and I-QA-12).

- Were taking field measurements with improperly calibrated instruments (see Finding SW/CF-1).

Sampling personnel at NPR-3 and NQGR-3 indicated that they had not been formally trained to perform assigned tasks (I-QA-12), that training was not current (I-SW-5), and that there is no program to provide periodic training updates (I-QA-4, I-QA-11, and I-QA-12) (see Finding SW/CF-3).

Sampling for environmental monitoring and surveillance of potable, ground, and surface waters is being conducted by an administrative assistant, rather than an environmental specialist, contrary to qualification and responsibility requirements of NPOSR-CUM job descriptions (QA-33 and QA-34; I-QA-1 and I-QA-12).

The JBIQ Health and Safety Procedure and Training Program developed by URI Environmental Health Systems has not been fully implemented (QA-34; I-QA-11).

Waste generators are not trained to ensure that wastes are properly characterized (I-WM-7).

Landfill operators are not trained to ensure that the landfill is operated in accordance with permit and regulatory requirements (I-WM-16).

Personnel responsible for road applications are not trained to ensure compliance with WDEQ requirements (I-WM-14).

Personnel operating the landfill are not formally trained to ensure compliance with WDEQ requirements (I-WM-16).

Documentation is not available to verify implementation of a spill control training program (see Finding SW/CF-3).

This finding was partially identified in the DOE/NPOSR-CUM self-assessment (April 1992) and partially identified in the JBIQ self-assessment (April 1992). The DOE/NPOSR-CUM self-assessment failed to identify specific deficiencies in this area, and the JBIQ self-assessment incorrectly assumed that personnel had sufficient technical knowledge and understanding to perform their assigned tasks without supervision.

The apparent causal factors for this finding are a lack of policy implementation, in that training policies were not appropriately implemented and updated; risk associated with potential production of unacceptable environmental data was not evaluated; and allocation of resources, in that NPOSR-CUM has not provided adequate resources for formal training and continuing on-the-job training.
FINDING QA/CF-6: Quality Assurance Personnel Independence

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 10.a, states "a quality assurance program (QAP) consistent with DOE 5700.6B [superseded by DOE 5700.6C] shall be established covering each element of environmental monitoring and surveillance programs."

DOE 5700.6C, "Quality Assurance," Section 9.b(1)(a), states "the QAP shall describe the organizational structure, functional responsibilities, levels of authority, and interfaces for those managing, performing, and assessing adequacy of work. This Order also states "the organization performing independent assessments shall have sufficient authority and freedom from the line organization to carry out its responsibilities."

Finding

DOE/NPOSR-CUW has an organizational structure in which quality assurance personnel report directly to line departments, restricting their independence.

Discussion

The independence and impartiality of quality assurance personnel are essential and integral parts of an effective QAP. Persons responsible for quality attainment must have sufficient authority and organizational freedom to identify problems; to initiate, implement, and verify corrective actions; and to control deficiencies. The DOE/NPOSR-CUW Quality Assurance Officer is appointed by the Director of NPOSR-CUW. However, the Quality Assurance Officer is unable to give undivided attention to quality assurance issues because his primary responsibility is civil engineering. Specific deficiencies pertaining to functional independence that affect environmental quality assurance are:

The DOE/NPOSR-CUW Quality Assurance Officer, under the most recent DOE/NPOSR-CUW organizational matrix, has primary responsibility as a Civil Engineer reporting to the Director of Engineering and secondary responsibility as the QA Officer reporting to the Director of NPOSR-CUW (QA-10; I-QA-10); and

Under the February 25, 1992, organizational matrices, the Civil Engineer/Quality Assurance Officer reported primarily to the Director of Engineering and secondarily, through the Director of Engineering, to the Occupational Safety and Health Officer (OSHA matrix) or the environmental specialist (Environmental matrix) (QA-36; I-QA-10).

This finding was not identified in the DOE/NPOSR-CUW self-assessment (April 1992).

The apparent causal factors for this finding are a lack of policy implementation, in that DOE/NPOSR-CUW has not implemented an environmental QAP in which the Quality Assurance Officer has the functional independence required by DOE Orders; and allocation of resources, in that there is a lack of personnel available for QA functions.
are not being conducted by NPOSR-CUW personnel (I-QA-3 and I-QA-10).

NPOSR-CUW has not implemented procedures for the conduct of quality assurance audits (I-QA-3 and I-QA-10). However, JBEC's management and operations contractor self-assessment program and DOE/NPOSR-CUW's self-assessment program were approved by FE-1 in June 1992 (QA-37 and QA-53).

NPOSR-CUW has not implemented a program to train quality assurance auditors (I-QA-3 and I-QA-10).

The apparent causal factor for this finding is policy implementation, in that DOE policy requiring quality assurance audits has not been implemented by NPOSR-CUW.

FINDING QA/CF-B: Environmental Data Validation

Performance Objective

DOE 5400.1, "General Environmental Protection Program," states "a quality assurance program consistent with DOE 5700.6B [superseded by DOE 5700.6C] shall be established covering each element of environmental and surveillance programs commensurate with its nature and complexity." One of the elements specifically required by this Order is independent data verification.

DOE 5700.6C, "Quality Assurance," Criterion 10, "Independent Assessment," states "Planned periodic independent assessments shall be conducted to measure item quality and process effectiveness and to promote improvement. The organization performing independent assessments shall have sufficient authority and freedom from line organization to carry out its responsibilities. Persons conducting independent assessments shall be technically qualified and knowledgeable in the areas assessed."

DOE 5700.6C also identifies QAMS 004, Guidelines and Specifications for Preparing QA Program Plans, as an EPA guidance document that should be used for environmental protection programs.

DOE 5700.6C, Attachment 1, Page 2, Paragraph 2, states "Programs developed and properly implemented using ASME/NQA-1 will meet the majority of requirements of this Order."

DOE/NPOSR-CUW Quality Assurance Program Manual (March 1992) preamble states "This manual is also designed to meet the requirements of ANSI/ASME NQA-1."

JBEC Quality Assurance Program Manual (April 1992), Number 11, states "This manual is also designed to meet the requirements of ANSI/ASME NQA-1 to maintain consistency with DOE at NPOSR-CUW."

QAMS-004 defines data validation as "the process whereby data are accepted or rejected based on a set of criteria." Quality Assurance Project Plans must indicate the specific criteria that will be used for data validation.

ASME NQA-1, "Quality Assurance Program Requirements for Nuclear Facilities," Basic Requirement 18, "Audits," states "Audits shall be performed to verify compliance with all aspects of the quality assurance program. These audits shall be performed by personnel who do not have direct responsibility for performing the activities being reported."

Finding

NPOSR-CUW has not implemented a program for independent data verification that meets the requirements of DOE 5400.1, DOE 5700.6C, ASME NQA-1, and QAMS-004.

Discussion

Environmental data must be validated and verified against program-specific data quality objectives prior to use in reports to any regulatory agency. Auditing is needed to ensure the quality of environmental data. During this review, the Environmental Subteam identified the following deficiencies:
The data generated from environmental sampling activities at NPOSR-CUW undergoes peer review and/or supervisory review. However, there is no subsequent audit of data by persons who are independent of the activity performed (I-QA-3, I-QA-7, and I-QA-10).

No independent validation is performed on H₂S data generated during air sampling activities (I-QA-4).

No validation is performed on pH and conductivity data generated during National Pollutant Discharge Elimination System (NPDES) sampling activities (I-QA-12).

There are no approved written procedures describing the process of data validation (I-QA-3 and I-QA-10).

This finding was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992) and partially identified in the JBEC self-assessment (April 1992). JBEC recognized the need to implement a review of data generated by contract analytical laboratories, but did not recognize the need to verify data collected by the air and environmental specialists.

The apparent causal factors for this finding are policy implementation, in that DOE policy requiring data verification has not been implemented by NPOSR-CUW; and risk, in that NPOSR-CUW did not evaluate the risk associated with unvalidated data.

FINDING QA/CF-9: Records Management

Performance Objective

DOE 5400.1, "General Environmental Protection Program," states "a quality assurance program consistent with DOE 5700.6B [superseded by DOE 5700.6C] shall be established covering each element of environmental monitoring and surveillance programs commensurate with its nature and complexity." The Order further requires that the Quality Assurance Plan include auditable records.

DOE 5700.6C, "Quality Assurance," Section 9.b(1)(d), states "records shall be specified, prepared, reviewed, approved, and maintained."

DOE 1324.5A, "Records Management Program," Section 5.b(2), requires the development and application of standards, procedures, techniques, and technology designed to ensure maintenance, security, preservation of, and access to environmental sampling records. Section 6.b(2) requires that departmental records be maintained and used in an effective, efficient, and authorized manner.

Finding

Records management practices at NPOSR-CUW do not ensure the maintenance, security, and preservation of environmental records of continuing value as required by DOE 1324.5A, DOE 5400.1, and DOE 5700.6C.

Discussion

NPOSR-CUW is required to monitor and maintain records of environmental surveillance. To ensure legal defensibility, records of these activities must be maintained and be auditable. Records of environmental sampling at NPOSR-CUW are incomplete, not standardized, and stored without due regard for potential damage or misplacement. During this review, the Environmental Subteam identified the following deficiencies:

Vital environmental records are not part of NPOSR-CUW archives. NPOSR-CUW archives are located at the Federal Building and U.S. Courthouse, Casper, WY; at the Polymer Building at NPR-3; and at Building No. 1269, 3886 Schulte, Casper, WY. Environmental records are kept at the ES&H Building at NPR-3. Records management procedures for existing environmental documentation are informal. No environmental monitoring records are stored at the Polymer Building or at the Federal Building archives (I-QA-1 and I-QA-15).

At NPR-3, sampling logs containing pH and conductivity measurements associated with National Pollutant Discharge Elimination System (NPDES) sampling are kept on a bookcase shelf in an unoccupied office. This office is not always locked when unattended and the shelf offers no protection from damage or loss (I-QA-12). At the NPR-3 Polymer Building, records are stored in boxes stacked on the floor rather than on pallets. During the Environmental
Subteam’s inspection, a cloudburst occurred and water penetrated under a door into the record storage area.

At the Federal Building and U.S. Courthouse in Casper, WY, records are stored on steel shelving in rooms B-6 and B-9A. These rooms are below grade and records stored there are at risk of water damage should fire or flooding occur (I-QA-15).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) partially identified this finding. Each of the self-assessments failed to identify specific deficiencies in this area.

The apparent causal factors for this finding are a lack of policy implementation concerning environmental record protection; and risk, in that the risk associated with the potential loss of environmental records was not evaluated.

FINDING QA/CF-10: Standards and Calibration

Performance Objective

DOE 5400.1, "General Environmental Protection Program," Chapter IV, Section 10.a, states "a quality assurance program consistent with DOE 5700.6B [superseded by DOE 5700.6C] shall be established covering each element of environmental monitoring and surveillance programs commensurate with its nature and complexity."

DOE 5400.1 further states that EPA-600/4-79-019, Handbook for Analytical Quality Control in Water and Wastewater Laboratories, should be used as a reference for environmental monitoring.

EPA-600/4-79-019, Chapter 12, states that the analyst should pay particular attention to the stability of standard reagents and that standards should not be kept longer than recommended by the manufacturer or in the method.

DOE 5700.6C, "Quality Assurance," Criterion 5, "Work Processes," Section d, states "a process should be established and implemented to control the calibration, maintenance, and use of measuring and test equipment used for monitoring and data collection." It also states that equipment should "have calibration certifications traceable to national standards."

DOE 5700.6C, Attachment I, Page 2, Paragraph 2, states "Programs developed and properly implemented using ASHE/NQA-1 will meet the majority of requirements of this Order." DOE/NPOSR-CUW Quality Assurance Program Manual (March 1992) preamble states "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1." JBEC Quality Assurance Program Manual (April 1992), Number 11, states "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1 to maintain consistency with DOE at NPOSR-CUW."

ASHE NQA-1, "Quality Assurance Program Requirements for Nuclear Facilities," Basic Requirements 12, "Control of Measuring and Test Equipment," states "tools, gauges, instruments, and other measuring and test equipment used for activities affecting quality shall be controlled and at specified periods calibrated and adjusted to maintain accuracy within necessary limits. This requires that measuring and test equipment shall be calibrated and adjusted, and maintained at prescribed intervals or, prior to use, against equipment having known relationships to nationally recognized standards." It also states "if no nationally recognized standards exist, the bases for calibration shall be documented. Calibrations shall be performed in accordance with documented instructions. Records shall be maintained and equipment shall be suitably marked to indicate calibration status."

Finding

NPOSR-CUW does not have a program in place to ensure that sampling and analytical activities meet the requirements for use of standards and instrument calibrations required by DOE 5400.1, DOE 5700.6C, ASHE NQA-1, and EPA-600/4-79-019.
Discussion

To ensure the defensibility of data, equipment used to collect environmental data must be operating properly. Records of calibration and maintenance must be maintained, and evidence of calibration must be shown on each instrument that requires calibration. Traceability of a standard's lot number is essential to allow detection of questionable data in the event of a manufacturer's recall. The Environmental Subteam identified the following deficiencies related to standards and calibration:

NPOSR-CUW has not established a program for tracking equipment calibration and maintenance. Equipment calibration and maintenance, and documentation of these activities, are dependent upon the initiative of the field personnel (I-QA-1, I-QA-4, and I-QA-11).

Environmental monitoring instruments are not tagged to identify calibration status, next recall date, or the identity of the person responsible for calibration and maintenance (I-QA-4, I-QA-11, and I-QA-12).

There are no approved written procedures describing the processes of calibration, maintenance, and standardization of equipment (I-QA-1 and I-QA-11).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) partially identified this finding. DOE/NPOSR-CUW failed to identify specific deficiencies in this area. JBEC did not recognize that programs for instrument control; instrument logs; and control of standards, reagents, and samples are required for air quality monitors, pH and conductivity meters, and other environmental monitoring equipment in use at NRA-3.

The apparent causal factors for this finding are policy implementation, in that DOE policy has not been implemented by NPOSR-CUW; a lack of written procedures to implement DOE Orders; and inadequate training of personnel who perform inspections and tests.

FINDING QA/CF-11: Use of Chain-of-Custody

Performance Objective

DOE 5400.1, "General Environmental Protection Program," requires that a quality assurance program consistent with DOE 5700.6B (superseded by DOE 5700.6C) shall be established covering each element of environmental monitoring and surveillance programs and that the quality assurance program shall include chain-of-custody procedures.

DOE 5400.1 further states that SW-846, Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, and EPA-600/4-79-019, Handbook for Analytical Quality Control in Water and Wastewater Laboratories, should be used as references for environmental monitoring.

EPA-600/4-79-019, Chapter 12, states that samples must be accompanied by a chain-of-custody record that includes the name of the study, collectors' signatures, station number, station location, date, time, type of sample, sequence number, number of container, and analyses required.

SW-846 states that an essential part of any sampling/analytical scheme is ensuring the integrity of the sample from the time of collection to data reporting. The possession and handling of samples should be traceable from the time of collection through analysis and final disposition.

DOE 5700.6C, "Quality Assurance," Attachment I, Page 2, Paragraph 2, states "Programs developed and properly implemented using ASME/NQA-1 will meet the majority of requirements of this Order." DOE/NPOSR-CUW Quality Assurance Program Manual (March 1992) preamble states "This manual is also designed to meet the requirements of ANSI/ASHE-1." JBEC Quality Assurance Program Manual (April 1992), Number 11, states "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1 to maintain consistency with DOE at NPOSR-CUW."

ASME NQA-1, Quality Assurance Program Requirements for Nuclear Facilities," Basic Requirements 8, "Identification and Control of Items," states "when specified by codes, standards, or specifications that include specific identification requirements, the program shall be designed to provide such identification and control."

Finding

NPOSR-CUW personnel do not consistently document or implement a chain-of-custody protocol during field sampling activities as required by DOE Orders, ASME NQA-1, EPA-600/4-79-019, and SW-846.

Discussion

The JBEC Environmental Department is responsible for ensuring compliance with DOE, EPA, Wyoming Department of Environmental Quality, Colorado Department of Health regulations, and JBEC policies by means of site environmental monitoring and surveillance. The JBEC Environmental Department monitors spill prevention and cleanup and conducts National Pollutant Discharge Elimination System (NPDES), air, potable water and groundwater sampling. The defensibility of data generated in support of effluent monitoring and
environmental surveillance programs is compromised by not consistently adhering to strict chain-of-custody procedures. The Environmental Subteam identified the following deficiencies during reviews:

Groundwater samples taken at NOSR-3 were not accompanied by a chain-of-custody record (I-QA-23) (see Finding GW/CF-3). NPDES effluent samples, and potable water samples taken at NPR-3 were accompanied by chain-of-custody records; however, record entries were not made at the time samples were taken. At each sampling site, the custody data are recorded on paper. When all sites have been sampled, the data are copied onto the chain-of-custody form and the paper on which the original data was recorded is discarded (I-QA-11).

Receipt and storage of sampling containers are not included in the chain-of-custody records. Sample chain-of-custody properly begins at the time a sample is taken. However, JBEC procures sample containers from the subcontractor analytical laboratory. Good laboratory practice would include procurement and storage within the chain-of-custody to ensure that sample containers have not been contaminated prior to use (I-QA-11).

There are no approved written procedures describing the process of initiating and maintaining a chain-of-custody record (I-QA-1). This finding was not identified in the DOE/NPOSR-CUW self-assessment (April 1992) and was partially identified in the JBEC self-assessment (April 1992). JBEC recognized that chain-of-custody procedures were not validated or controlled, but did not recognize that procedures were deficient.

The apparent causal factors for this finding are policy implementation, in that DOE policy has not been implemented; supervision, in that supervisory controls are inadequate for implementing policies, procedures, and standards; inadequate personnel training; and a lack of written procedures to implement DOE Orders.

FINDING QA/CF-12: Procurement of Analytical Services

Performance Objective

DOE 5400.1, "General Environmental Protection Program," states "a quality assurance program consistent with DOE 5700.6B [superseded by DOE 5700.6C] shall be established covering each element of environmental monitoring and surveillance programs commensurate with its nature and complexity." DOE 5400.1, Section 10.b, further states "Where DOE operations secure the support of outside contract laboratories, this work shall be conducted by appropriately certified laboratories."

DOE 5700.6C, "Quality Assurance," Section 9.b(2)(c), states "The organization shall ensure that procured items and services meet established requirements and perform as specified" and that "prospective suppliers be evaluated and selected on the basis of specific criteria."

DOE 5700.6C, Attachment 1, Page 2, Paragraph 2, states "Programs developed and properly implemented using ASHE/NQA-I will meet the majority of requirements of this Order." DOE/NPOSR-CUW Quality Assurance Program Manual (March 1992) preamble states "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1." JBEC Quality Assurance Program Manual (April 1992), Number ii, states "This manual is also designed to meet the requirements of ANSI/ASHE NQA-1 to maintain consistency with DOE at NPOSR-CUW."

ASHE NQA-1, Basic Requirement 7, "Control of Purchased Items and Services," states "The procurement of items and services shall be controlled to assure conformance with specific requirements. Such control shall provide for the following as appropriate: source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspection, audit, and examination of items or services upon delivery or completion."

Finding

NPOSR-CUW does not have a program or procedures that ensure the quality of subcontractor services as required by DOE 5400.1, DOE 5700.6C, and NPOSR-CUW quality assurance program manuals.

Discussion

To ensure that environmental quality assurance requirements are applied to the procurement of environmental services, and that only certified sources are used, a quality assurance review must be included in the procurement process. The Environmental Subteam identified the following deficiencies:

NPOSR-CUW has not developed or implemented procedures for evaluation and selection of subcontract analytical laboratories prior to the placement of an order. A list of laboratories certified for environmental analyses is maintained and updated; however, no other requirements, such as minimum requirements and performance standards, are specified. Statements of work associated with purchase orders typically specify only the number and types of analyses to be conducted (QA-16; I-QA-1).
NPOSR-CUW does not conduct periodic audits or reviews of contract analytical laboratory performance (I-QA-3 and I-QA-10).

At one subcontractor analytical laboratory, the Environmental Subteam noted a lack of control of standard operating procedures. Procedures for analysis of radium had numerous annotations that could make it difficult to determine how a given sample was analyzed (I-QA-9).

The DOE/NPOSR-CUW self-assessment (April 1992) and JDEC self-assessment (April 1992) partially identified this finding. Each of these self-assessments failed to identify specific deficiencies in this area.

The apparent causal factors for this finding are a lack of policy implementation, in that DOE policy requiring oversight of subcontractors has not been implemented; and risk, in that potentially questionable analyses have not been evaluated.

3.5.7 Radiation

3.5.7.1 Overview

The radiation portion of the Environmental Subteam assessment at NPOSR-CUW evaluated current operational practices and programs to determine the compliance status with Federal, state, and local regulations, and DOE Orders. The programs were also reviewed against DOE/HH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance, and against commonly accepted industry practices and standards of performance.

The assessment included interviews with the NPOSR-CUW employees; inspection of NPOSR-CUW facilities and locations; and review of documents, procedures, and records associated with environmental radiation protection programs.

Table 3-9 lists environmental radiation protection regulations, DOE Orders, and guidelines used during this assessment.

As a part of the environmental radiation assessment, reviews were coordinated with other Environmental Subteam specialists in the areas of soils, sediments, and biota; groundwater; surface water; and quality assurance to ensure that all potential environmental radiation problems were identified and evaluated.

Environmental radiation protection programs at NPOSR-CUW are limited. The facilities are principally involved in the production of oil and gas at NPR-3 and gas production at NOSR-1 and NOSR-3. As such, there are only limited uses of radioactive materials. However, during the past several years there has been a heightened awareness within the petroleum industry, DOE, and the State of Wyoming regarding the presence of naturally occurring radioactive materials (NORM), which often accompany oil, gas, and produced water streams. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the environmental radiation assessment.

The Wyoming Department of Environmental Quality (WYDEQ) has been examining NORM issues since early 1989. At that time, a sample of four produced water streams at various Wyoming outfalls showed that one of the streams had elevated radium-226 concentrations. This result and other information, such as information from the State of Louisiana, prompted WYDEQ to evaluate all produced water dischargers in the state. During August 1989, NPOSR-CUW received a request from the state to test its produced waters at NPR-3. Samples were obtained and were assayed for radium-226, with the results being transmitted to WYDEQ during September 1989. Eight samples were obtained and analyzed for radium-226. All of the samples were less than the WYDEQ limit of 60 picoCuries per liter (total radium) effluent limit for class 4 waters. Some produced waters from NPR-3 are discharged to Teapot Creek and Little Teapot Creek which are both class 4 waters.

Included in the review of NORM was an assessment of the completeness and relevance of records to determine whether further radiation surveys and sampling are necessary to meet the requirements of NORM regulations and guidance. In addition to NORM, NPOSR-CUW has some industrial uses for radioactive materials. These include nondestructive testing of hardware and fracture testing using sands tagged with radioactive materials. The use of these materials was reviewed at all NPOSR-CUW sites (except NOSR-2) to assess controls and potential impacts on the public and the environment.
### TABLE 3-9
LIST OF RADIATION REGULATIONS/REQUIREMENTS/GUIDELINES

<table>
<thead>
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<th>Regulations/Requirements/Guidelines</th>
<th>Sections/Title</th>
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<tr>
<td>DOE 5400.1</td>
<td>General Environmental Protection Program</td>
<td>DOE</td>
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<td>DOE 5400.3</td>
<td>Hazardous and Radioactive Mixed Waste Program</td>
<td>DOE</td>
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<td>DOE 5400.5</td>
<td>Radiation Protection of the Public and the Environment</td>
<td>DOE</td>
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<td>DOE 5400.9</td>
<td>Sealed Radioactive Source Accountability</td>
<td>DOE</td>
</tr>
<tr>
<td>DOE 5480.1B</td>
<td>Environment, Safety, and Health Programs and Department of Energy Operations</td>
<td>DOE</td>
</tr>
<tr>
<td>DOE 5480.4</td>
<td>Environmental Protection, Safety and Health Protection Standards</td>
<td>DOE</td>
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<td>DOE 5480.11</td>
<td>Radiation Protection for Occupational Workers</td>
<td>DOE</td>
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<td>DOE 5480.19</td>
<td>Conduct of Operations Requirements for DOE Facilities</td>
<td>DOE</td>
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<td>DOE 5484.1</td>
<td>Environmental Protection, Safety, and Health Protection Information Reporting Requirements</td>
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<td>DOE 5700.6C</td>
<td>Quality Assurance</td>
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<td>DOE 5820.2A</td>
<td>Radioactive Waste Management</td>
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<td>DOE 6430.1A</td>
<td>General Design Criteria</td>
<td>DOE</td>
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<tr>
<td>DOE/EH-0173T</td>
<td>Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance</td>
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<td>Standards for Protection Against Radiation</td>
<td>NRC</td>
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<td>10 CFR 34</td>
<td>Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations</td>
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<tr>
<td>10 CFR 39</td>
<td>Licenses and Radiation Safety Requirements for Well Logging</td>
<td>NRC</td>
</tr>
</tbody>
</table>

The Environmental and the Safety and Health Departments are responsible for radiation protection activities at NPOSR-CUN. Managers of these departments have had radiation safety training as part of their previous job experience, but their current training and experience are limited. There are no other personnel at NPOSR-CUN that have had radiation safety training.

The present activities at NPR-3 may result in the generation of radioactive waste. Radioactive waste may be generated as a result of pigging operations which remove deposited radium-226/228 scale from transfer piping. Systems that handle produced water may also contain radioactive scale. Typical areas of concern include ends of tubulars and pipes, all openings in manifolds, both ends and the throats of valves, and accumulations in vessels and tanks. Other sources of waste include piping and the glycol filters at the LTS Gas Plant, which may contain radioactive lead-210 and its radioactive progeny.

There were no environmental radiation findings identified during the 1988 Environmental Survey.

Overall, the radiation environmental protection programs require improvement to meet DOE requirements. In general, the radiological risks to the public and the environment from operations at NPOSR-CUN are low. Direct radiation exposure from radiography represents a possible, but very low potential source of exposure. For the limited samples of produced waters obtained, concentrations of NORM in these waters are less than the State of Wyoming effluent limits, and do not appear to be a potential source of radiation dose to the general public. NPOSR-CUN has not fully evaluated the potential for radiation doses to the public from release of scrap materials containing NORM. Although protection of the public and the environment from radioactive materials has not been an issue, NPOSR-CUN lacks formal programs and procedures to document proper protection of the public and the environment. Documentation to demonstrate compliance with DOE Orders and regulations is not maintained and formalized into auditable records.

The radiation portion of the Environmental Subteam assessment identified three compliance findings. The findings pertain to radiation protection of the public and the environment, oversight of subcontractors using radioactive materials and radiation producing equipment, and managing NORM.
3.5.7.2 Compliance Findings

FINDING RAD/CF-1: Radiation Protection of the Public and the Environment

Performance Objective

DOE 5400.5, "Radiation Protection of the Public and the Environment," Section 1, establishes standards and requirements for operations of DOE and DOE contractors with respect to protection of the members of the public and the environment against undue risk from radiation.

DOE 5400.5, Section 4, requires that Heads of Field Operations provide to the appropriate Program Office, with a copy to the Assistant Secretary for Environment, Safety and Health (EH-1) by April 8, 1990, a certification for those areas covered by the Order for which the site is in compliance; and/or a request for exemption for areas not yet in compliance that includes a plan for achieving compliance.

DOE 5400.5, Section 6.a, states that it is a DOE objective that potential exposures to members of the public be as far below the limits as is reasonably achievable (ALARA), and that DOE facilities have the capabilities, consistent with the types of operations conducted, to monitor routine and non-routine releases and to assess dose to members of the public.

DOE 5400.5, Chapter II, Section 2, requires Field Elements to develop a program, and requires contractors to implement the ALARA process for DOE activities and facilities that cause public doses.

Finding

NPOSR-CUW does not have a radiation protection program in place for the public and the environment as required by DOE 5400.5.

Discussion

NPOSR-CUW has not implemented applicable radiation protection requirements of DOE 5400.5. The scope of the NPOSR-CUW Environmental Protection Implementation Plan does not include radiation protection concerns, except for produced water monitoring conducted during 1989. Examples of failure to properly implement DOE 5400.5 include, but are not limited to, the following:

NPOSR-CUW has not provided the required certification of compliance or requested an exemption to DOE 5400.5 by April 8, 1990, as required by Section 4 of DOE 5400.5 (I-R-10).

DOE/NPOSR-CUW has not reviewed the Order and has not sent implementation correspondence to JBEC. The Order was published on February 8, 1990, and became effective on May 8, 1990 (I-R-10).

NPOSR-CUW has not developed a graded approach to the ALARA requirements of DOE 5400.5. These requirements apply to the use of radiography cameras by subcontractors, the use of well logging devices by subcontractors, and other activities that use radionuclides or radiation producing devices (I-R-1 and I-R-9).

NPOSR-CUW has not implemented the residual radioactive material requirements of Chapter IV of DOE 5400.5 (see Finding RAD/CF-3). The DOE/NPOSR-CUW self-assessment (April 1992) and JBEC self-assessment (April 1992) fully identified this finding.

The apparent causal factor for this finding is policy implementation in that NPOSR-CUW has not implemented DOE policies.
FINDING RAD/CF-2: Oversight of Subcontractors

Performance Objective

DOE 5400.5, "Radiation Protection of the Public and the Environment," Section 1, establishes standards and requirements for operations of DOE and DOE contractors with respect to protection of members of the public and the environment against undue risk from radiation.

DOE 5400.5, Section 6.a, states that it is a DOE objective that potential exposures to members of the public be as far below the limit as is reasonably achievable (ALARA) and that DOE facilities have the capabilities, consistent with the types of operations conducted, to monitor routine and nonroutine releases and to assess dose to members of the public.

DOE 5400.1, "General Environmental Protection Program," states that it is DOE policy to conduct its operations in an environmentally safe and sound manner. It further states that it is DOE policy to conduct operations in compliance with both the letter and the spirit of applicable environmental statutes, regulations, and standards.

DOE N5400.9, "Sealed Radioactive Source Accountability," establishes interim policy and guidance for sealed source accountability. This Order requires facilities to establish procedures that will address radioactive material inventory, receipt, labeling, control, storage, transfer, disposal, recordkeeping, training, surveying, and integrity testing.


10 CFR 34, "Licenses for Radiography and Radiation Safety Requirements for Radiographic Operations," establishes requirements for the use of sealed radioactive sources containing byproduct material and radiation safety requirements for persons using these sources for radiography.

Finding

NPOSR-CUW does not have a complete program for oversight of subcontractors using radioactive materials or radiation-producing equipment.

Discussion

During the normal operation of oil fields, radioactive materials and radiation-producing equipment are used to support various activities. For example, at NPR-3, radiography is performed on welds for quality assurance. The Environmental Subteam reviewed working papers and other records of these projects during the assessment. The following deficiencies in subcontractor oversight were noted by the Environmental Subteam:

- When subcontracts for services are approved, there is no JBEC environmental specialist review to ensure that DOE environmental standards are incorporated into the subcontract (I-R-4).

During radiography operations there is oversight by JBEC. However, this oversight is not sufficient to ensure that these operations are conducted in accordance with the requirements of DOE Orders and 10 CFR 34 (I-R-1).

Subcontractor procedures that provide instructions to workers using radioactive materials were reviewed by the Environmental Subteam (R-9 and R-11). These procedures do not incorporate the requirements of DOE 5400.5, N5400.9, 5820.2A, and 5480.11. The spill procedures do not contain detailed information and do not require notification of JBEC or DOE/NPOSR-CUW personnel in the event of a spill of radioactive material. There are no requirements for contamination surveys of equipment or personnel, which may be required during certain situations. Finally, there are no posting or contamination protection requirements included in the procedures.

NPOSR-CUW does not have a program in place to comply with the requirements of DOE N5400.9 (I-R-1).

NPOSR-CUW does not have a program in place to ensure that the requirements of 10 CFR 39 are observed during well logging activities (I-R-1).

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992) and was fully identified in the JBEC self-assessment (April 1992). DOE/NPOSR-CUW did not identify the first issue regarding environmental reviews.

The apparent causal factor for this finding is appraisals/audits/reviews in that NPOSR-CUW did not have sufficient oversight of subcontractors.
FINDING RAD/CF-3: Management of Naturally Occurring Radioactive Materials

Performance Objectives

DOE 5400.5, "Radiation Protection of the Public and the Environment," Chapter IV, Section 4.a(2), contains the guidelines for residual radium-226 contamination in soil. These are 5 pCi/g averaged over the first 15 cm of soil below the surface, and 15 pCi/g averaged over 15 cm thick layers of soil more than 15 cm below the soil.

DOE 5820.2A, Radioactive Waste Management," Chapter IV, states "DOE waste containing naturally occurring and accelerator produced radioactive material . . . shall be stored, stabilized in place, and/or disposed of consistent with the requirements of the residual material guidelines contained in 40 CFR 192."

The American Petroleum Institute (API) has developed guidance for NORM management in its "Bulletin on Management of Naturally Occurring Radioactive Materials (NORM) in Oil and Gas Production Draft No. 6." Section 1.1 states "when equipment is opened for inspection or repair, personnel can be exposed to radioactivity by inhaling or ingesting NORM . . . . It is also important that NORM waste or equipment containing NORM be managed and disposed by methods that protect the public from unnecessary exposure."

API Guidance, Section 3.1.3, states that soil may become NORM-contaminated as a result of various production and maintenance operations . . . by such activities as equipment cleanout, tubular descaling, produced water pits, and land farming of tank bottoms. Soil surveys should be conducted over the subject land area on a delineated grid.

API Guidance, Section 5.3.1, states that removed scale, sludge, and other particles should be placed in appropriate containers for storage. Paragraph 6 also states that all contaminated materials are preferably maintained in a wet state to prevent the inhalation of dust by workers and to prevent dust releases.

Finding

Current practices at NPOS-CUW for NORM management do not fully comply with the requirements of DOE Orders and API Guidance.

Discussion

NPOS-CUW has conducted several surveys for potential NORM contamination of produced water, the Low Temperature Gas Plant glycol filters, and some scales. However, the scope of the surveys was not comprehensive. The Environmental Subteam observed the following concerns:

The Low Temperature Gas Plant has not been surveyed for lead-210, bismuth-210, and polonium-210 as suggested by API guidance (I-R-7).

During tours of the Scrap Yard and Warehouse Yard, various pieces of hardware were observed to contain scales. These materials have not been surveyed for NORM, and the scale is exposed to the environment (I-R-7). API Guidance recommends that all contaminated materials be maintained in a wet state to prevent dust releases.

Produced waters that enter Teapot Creek and Little Teapot Creek were sampled for radium-226 in 1989. The results of the analyses showed these waters comply with State of Wyoming effluent limits. However, there has been only one followup since 1989, which was conducted during the Tiger Team visit (R-5). No procedures have been developed for National Pollutant Discharge Elimination System (NPDES) sampling for radium-226, which will be required in January 1993.

Only one well has been surveyed for NORM scale (R-3), and there have been no soil surveys after maintenance and other activities. API Guidance suggests that during well workovers, equipment, maintenance, equipment handling and repair, and vessel entry, NORM be surveyed and controlled to protect workers and the environment.

The DOE/NPOS-CUW self-assessment (April 1992) and JBE self-assessment (April 1992) fully identified this finding.

The apparent causal factor for this finding is policy implementation in that NPOS-CUW has not implemented DOE policies and API Guidelines.
3.5.8 Inactive Waste Sites

3.5.8.1 Overview

The purpose of the inactive waste sites portion of the Environmental Subteam assessment at NPOS-CUW was to evaluate the programmatic and technical status of the NPOS-CUW programs for the management and remediation of inactive waste sites. The programs were evaluated against criteria established in regulations, permits, industry guidance, and best management practices. The primary regulations governing programs for inactive waste sites are those promulgated under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) as amended by the Superfund Amendments and Reauthorization Act (SARA) of 1986. The regulations, requirements, and guidance documents reviewed are listed in Table 3-10.

The general approach to the assessment included interviews with DOE/NPOS-CUW and JREC personnel; inspection of facilities and inactive waste sites; and review of documents including policies and procedures, previous environmental reports, related technical reports, and historic documents relating to the activities at NPR-3, NOSR-1, and NOSR-3. During the assessment, groundwater/soils, sediments, and biota, toxic and chemical materials, waste management, and surface water Environmental Subteam technical specialists were consulted regarding the potential for contamination at various locations.

There has been no development of the resources at NOSR-2 in Utah. However, since there is public access to the property, aerial photos were ordered by DOE/NPOS-CUW to be reviewed to identify potential dump sites. These photos were not received prior to conclusion of the inactive waste sites assessment; therefore, NOSR-2 was not included in the inactive waste sites assessment.

NPOS-CUW has not developed any formal programs to administer CERCLA-related activities. Several studies have been conducted to comply with the provisions of CERCLA and DOE Orders including the NPR-3 Phase I assessment and two preliminary assessments conducted for the Anvil Points Facility at NOSR-3. These studies identified several inactive waste sites; however, the studies were not comprehensive in nature and did not include a review of historic documentation or interviews with appropriate personnel to systematically identify all known inactive waste sites. To date, no remedial or removal actions have been conducted at any of the identified inactive waste sites.

During the assessment, a number of inactive waste sites were identified that have not been investigated. These sites include, but are not limited to, solid waste disposal areas and septic systems associated with oil exploration and development activities at NPR-3 during the 1920s, an abandoned septic system at NPR-3, an abandoned landfill along the road to the mine bench at NOSR-3, the potential release of friable asbestos to the environment at NOSR-1 and NOSR-3, and abandoned underground storage tanks at the mine bench at NOSR-1. The lack of identification and investigation of these sites is a symptom of the informal programs used to implement CERCLA and DOE 5400.4.

The assessment covered release reporting, including the identification of substances with reportable quantities, evaluation of releases subject to notification requirements, and recordkeeping and training activities. No procedures have been developed for implementation of DOE’s occurrence reporting requirements.
### TABLE 3-10

<table>
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<th>Regulations/Requirements/Guidelines</th>
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<td>General Environmental Protection Program</td>
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<td>National Oil and Hazardous Substances Contingency Plan</td>
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<td>Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA</td>
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<td>C.R.S. 25-16-102</td>
<td>Colorado Hazardous Waste Clean Up Acts</td>
<td>Colorado Department of Health</td>
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Compliance with the SARA Title III requirements at NPR-3 was evaluated by the Environmental Subteam air specialist. Tier II reports have been submitted to Wyoming and Natrona County Emergency Planning Agencies (the state emergency planning commission and the local emergency planning committee), but there has been no formal program developed to identify substances present in threshold planning quantities (TPQs), nor are there procedures to submit to the Emergency Management Agencies updated material safety data sheets and to inform them of new chemicals present onsite and chemicals that are no longer present at the site.

Several of the inactive waste sites identified during the Tiger Team Assessment were also identified by the Environmental Survey Team in 1988. NPOSR-CUII has conducted some followup investigations at NPR-3 on areas identified in the 1988 Environmental Survey: the mud pits, which may be contaminated with chromium, and the suspected 2,4-D disposal area. NPOSR-CUII has not followed up on other previously identified sites such as the 1920s NPR-3 disposal sites and the potential releases of asbestos at NOSR-1 and NOSR-3. There are plans to remove the asbestos at NOSR-1 and NOSR-3; however, these areas were not addressed under CERCLA.

Overall, NPOSR-CUII needs considerable improvement in the area of inactive waste site management to meet the requirements of DOE Orders and Federal regulations. The activities related to inactive waste sites conducted to date have generally been reactions to specific releases and do not represent a comprehensive, proactive sitewide effort to discover and assess the overall environmental condition of the site. The lack of formalized programs to implement the requirements of CERCLA and DOE 5400.4 is the major stumbling block in achieving a comprehensive and proactive approach for identifying and evaluating inactive waste sites.

The assessment of inactive waste sites identified four compliance findings, one best management practice finding, and one special issue related to the management of inactive waste sites and/or to regulatory requirements of CERCLA. The compliance findings address the following areas: inactive waste site programs, identification and evaluation of inactive waste sites, development of an administrative record file, and spill reporting. The best management practice finding addresses NPR-3's hazardous chemical reporting program under the Emergency Planning and Community Right-to-Know Act. The special issue discusses the potential liability and risks associated with the Anvil Points Shale Pile at NOSR-3.

3.5.8.2 Compliance Findings

FINDING IWS/CF-1: Inactive Waste Site Programs

Performance Objective

DOE 5400.4, "Comprehensive Environmental Response, Compensation, and Liability Act Requirements," Section 7.a, states "It is the policy of DOE to respond to releases and potentially imminent releases of hazardous substances... in accordance with the provisions of CERCLA, as amended, as well as those of the NCP and Executive Order 12580... regardless of whether the facility is listed on the National Priorities List (NPL)."

DOE 5480.19, "Conduct of Operations," states that it is DOE policy to conduct its operations with a consistent and auditable set of requirements, standards, and responsibilities. Chapter 1 of the Order states "effective implementation and control of operating activities are primarily achieved by establishing written standards in operations, periodically monitoring and assessing performance, and holding personnel accountable for their performance."

Finding

NPOSR-CUII has not established programs to implement the requirements of DOE 5400.4, DOE 5480.19, CERCLA, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), and Executive Order 12580.

Discussion

CERCLA related activities at NPOSR-CUII have been carried out without the benefit of established programs that outline the requirements of CERCLA and DOE Orders (I-IWS-7, I-IWS-8, and I-IWS-12). As a result of this informality, site personnel were generally unaware of many of the provisions of CERCLA and its implementing regulations (I-IWS-7 and I-IWS-8). Although the relative degree of potential contamination at NPOSR-CUII is minimal and many of the provisions of CERCLA have not been invoked to date, it is important that there be a complete understanding of the regulations to determine the need for specific actions. The following are some of the inactive waste site program components that have not been established:

- Implementation plan for DOE 5400.4;
- Program to systematically identify, characterize, and manage inactive waste sites (see Finding IWS/CF-2);
- Program to assess natural resource damages and to notify Trustees of Natural Resources (40 CFR 300, Subpart 6);
- Program for reporting hazardous substance activity when transferring Federal real property (40 CFR 373);
- Program to establish and maintain an administrative record file (40 CFR 300, Subpart I) (see Finding IWS/CF-3); and
- Program to review and update inventories of inactive waste sites.
The apparent causal factors for this finding are a lack of policy implementation of the requirements of DOE 5400.19 and DOE 5400.4; a lack of written procedures specifying the requirements of CERCLA and implementation steps; and insufficient training of site personnel in the provisions of CERCLA.

The DOE/NPOSR-CUII self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified this finding.

Finding

NPOSR-CUII has not completely identified or evaluated inactive waste sites in accordance with the provisions of 40 CFR 300.410, 40 CFR 300.420, and DOE Orders.

Discussion

The Phase I installation assessment formerly required by DOE 5480.14 and the remedial PA required by 40 CFR 300.420 are essentially analogous. NPOSR-CUII has prepared a Phase I assessment for NPR-3 and two PAs for NOSR-3 to comply with DOE Orders and CERCLA. No documentation was found indicating that any reports were prepared for NOSR-1 to comply with the provisions of CERCLA.

Interviews with site personnel (1-IWS-6, 1-IWS-9, and 1-IWS-10), site inspections, and a review of historic documents (IWS-7) identified a number of inactive waste sites that were not identified in either the Phase I assessment of NPR-3 or the PAs prepared for NOSR-3. The following are examples of inactive waste sites that were not identified or evaluated by NPOSR-CUII under CERCLA:

**NPR-3**

All waste disposal areas from activities at NPR-3 during the 1920s. These areas include: solid waste disposal areas; abandoned septic systems from housing complexes; laboratories; the hospital; and potential sites where wastes from industrial facilities, such as the cracking plant in which gasoline was refined, were disposed.

The free water pit at the Bad Oil Facility that had been used to collect waste acid.
The recently abandoned septic system near the truck shop that disposed of wastewater from the Warehouse, truck shop, and administrative buildings.

NOR-1

The abandoned underground storage tanks located at the mine bench.

NOR-3

The solid waste disposal area for the housing complex and the industrial facilities at the Anvil Points Facility located along the road leading to the mine bench (I-INS-6).

Waste disposal areas associated with the Rulison Facility.

The asbestos disposal site located in the draw to the west of the Quonset Hut Warehouse.

The DOE/NPOSReg-CUW self-assessment (April 1992) and the JBEA self-assessment (April 1992) did not identify this finding. Although not identified in either self-assessment, site personnel were aware of most of the above-mentioned inactive waste sites prior to the Tiger Team Assessment.

The apparent causal factors for this finding are policy implementation of the requirements of 40 CFR 300.420 and DOE Orders, and a lack of procedures also to fulfill the requirements of these regulations and Orders. A secondary contributing factor is insufficient appraisals/audits/reviews to identify historic documents and interview knowledgeable site personnel that could provide insight into the past waste disposal practices at NPOSReg-CUW.

40 CFR 300, "National Oil and Hazardous Substances Pollution Contingency Plan," Subpart I, "Administrative Record for Selection of Response Action," outlines the requirements for establishing and maintaining the administrative record file for response actions under CERCLA, including special requirements for Federal facilities, the location of the administrative record file, and the contents of the record.

OSWER Directive No. 9833.3A-1, "Final Guidance on Administrative Records for Selecting CERCLA Response Actions," states that "the record should be compiled as documents relating to the selection of the response action are generated or received by the lead agency." The directive further states that "the administrative record file should be distinguished from the administrative record. The administrative record file refers to the documents as they are being compiled. Until a response action decision has been selected, there is no complete administrative record for that decision. Thus, to avoid creating the impression that the record is complete at any time prior to the final selection decision, the set of documents is referred to as the administrative record file rather than the administrative record."

Finding

NPOSReg-CUW has not established an administrative record file as required by 40 CFR 300, Subpart I, DOE Orders, and OSWER Directive No. 9833.3A-1.

Discussion

40 CFR 300, Subpart I, and OSWER Directive No. 9833.3A-1 requires DOE, as the lead agency, to establish an administrative record file that contains the documents that form the basis for the selection of a response action. These documents include such items as preliminary assessments and site evaluation reports, verified sampling data, chain-of-custody forms, and technical and engineering evaluations (40 CFR 300.810). The documents that form the administrative record file are to be kept at a central location of the lead agency and at a location at or near the site (40 CFR 300.805).

NPOSReg-CUW has generated several documents to assess potential releases of hazardous materials under CERCLA. These include: the "CERCLA Phase I Assessment for Naval Petroleum Reserves No. 3, May 1987" (IWS-2); the "Preliminary Assessment Report, Anvil Points Facility, Rifle, Colorado, April 1987" (IWS-3).
The apparent causal factors for this finding are a lack of appraisals/audits/reviews in that the need for establishing an administrative record; and a lack of location, and roles and responsibilities involved in generating administrative documents. This finding was partially identified in the Disposal Area,

DOE

1988" (IWS-1); and the "Preliminary Assessment, Spent Shale Pile and Drum Disposal Area, West Sharrard Gulch, Anvil Points Facility, June 1992" (IWS-3). Other documents that do not specifically address the provisions of CERCLA have been prepared which present sampling and analysis results of identified locations of potential releases of hazardous materials at NPR-3 and NOSR-3 (IWS-4; 1-IWS-5, and 1-IWS-6). These documents and other documents that form the basis for selection of a response action have not been incorporated into an administrative record file in accordance with 40 CFR 300, Subpart 1, OSMER Directive No. 9833.3A.1, and DOE Orders (1-IWS-7, 1-IWS-8, and 1-IWS-12).

Although NPOS0-CUII has not selected response actions under CERCLA, both DOE 5400.4 and OSMER 9833.3A.1 require DOE, as the lead agency, to compile the documents that will be used to select a response action in an administrative record file. This is further demonstrated in the "Administrative Records for Federal Facilities" fact sheet that states "the lead agency (as delineated in E.O. 12580) must compile and maintain the administrative record file (i.e., the incomplete record as it is being compiled)."

This finding was partially identified in the DOE/NPOS0-CUII self-assessment (April 1992) in that it was noted that there is no policy to establish an administrative record. This finding was not identified in the JBEC self-assessment (April 1992).

The apparent causal factors for this finding are a lack of policy implementation of the requirements of 40 CFR 300, Subpart 1, DOE Orders, and OSMER 9833.3A.1; a lack of procedures to formally establish the contents, location, and roles and responsibilities involved in generating an administrative record; and a lack of training of the site personnel who were generally not aware of the administrative record requirements of CERCLA. A secondary contributing factor for this finding is inadequate appraisals/audits/reviews in that the need for establishing an administrative record file had not been previously identified by JBEC.

FINDING IWS/CF-4: Spill Reporting

Performance Objective

DOE 5000.3A, "Occurrence Reporting and Processing of Operations Information," Section 8.g, requires DOE to direct contractors to "prepare and promulgate procedures for notification and reporting that are compatible with and serve the policies of this Order."

DOE 5000.3A, Section 7, further states "Attachment 1 to this Order, Categorization of Reportable Occurrences, shall be used to establish facility specific reporting requirements, and their categorizations."

The Spill/Leak Incident Report that is part of JBEC Policy and Procedure 1.5-04, "Spill and Leak Reporting," requires that all chemical and oil/fluid spills, leaks or unauthorized discharges be reported.

Finding

NPOS0-CUII has not developed formal procedures for implementing the requirements of DOE 5000.3A, and the spill reporting practices presently in use do not ensure that spills are correctly categorized and reported in accordance with DOE 5000.3A and JBEC Policy and Procedure 1.5-04.

Discussion

Spills of oil and hazardous materials at NPOS0-CUII are reported by two methods. The first method uses the Spill/Leak Incident Report (IWS-8) prepared by JBEC personnel and the second is through the DOE 5000.3A reporting process. The Spill/Leak Incident Report is designed to track all spills while the DOE 5000.3A reporting process is designed to report only those spills that have been categorized and require reporting under DOE 5000.3A. Interviews with NPOSO-CUII personnel and inspection of spill reporting records revealed that the established procedure for reporting spills (IWS-9) is out-of-date with respect to such elements as emergency phone numbers and does not incorporate the requirements of DOE 5000.3A. NPOS0-CUII has not developed formal reporting procedures for DOE 5000.3A nor have facility-specific categorization or reporting requirements been established.

NPOS0-CUII has been reporting spills through the DOE 5000.3A process since the inception of the Order. This reporting, however, has not been conducted with the benefit of a written procedure as required by DOE 5000.3A. The lack of procedures relating to occurrence categorization and clear definitions of roles and responsibilities has led to instances of incorrect categorization of spills and late submittals of occurrence reports (I-IWS-16). Although these instances have been few, they are indicative of the breakdowns that can occur without formalized procedures. A draft procedure has been prepared to implement the requirements of DOE 5000.3A (IWS-10) and is presently under review by NPOS0-CUII.

The JBEC policy and procedure, "Spill and Leak Reporting," dated March 16, 1990 (IWS-9), outlines the reporting requirements for field personnel and for management. In addition, the JBEC Spill/Leak Incident Report (IWS-8) indicates that all chemical and oil/fluid spills, leaks, or unauthorized discharges are to be reported. In actual field practice, oil
spills of less than 2 gallons are generally not reported (I-INS-16). The discrepancies between the established procedures and the informal field practices do not ensure that spills are being reported in a consistent manner throughout NPOSR-CUW. Additionally, training of field personnel is generally informal, which does not ensure a full understanding of NPOSR-CUW policy regarding spill reporting requirements.

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992) in that it was identified that NPOSR-CUW does not have procedures in place to consistently assess oil spills and to perform appropriate reporting and followup. This finding was fully identified in the JBEC self-assessment (April 1992).

The apparent causal factors for this finding are a lack of policy implementation of the DOE 5000.3A requirements for preparing facility-specific procedures and reporting requirements; inadequate supervision from DOE/NPOSR-CUW to JBEC on the preparation of DOE 5000.3A procedures until June 5 (INS-11); and a lack of formal training of field personnel concerning procedures for spill reporting and response.

3.5.8.3 Best Management Practice Findings

FINDING INS/BNFF-1: Emergency Planning and Community Right-to-Know Act Hazardous Chemical Reporting Program

Performance Objective

Best management practices suggest that sites have a program to collect, track, and manage material safety data sheets (MSDSs) and other information related to hazardous materials and waste in use or present onsite. This information is critical for proper reporting to state emergency planning commissions and local emergency planning committees under the Emergency Planning and Community Right-to-Know Act (EPCRA), "Hazardous Chemical Reporting: Community Right-to-Know" program.

Finding

NPOSR-CUW has not developed a formal program to manage chemical and MSDS information reporting and updates.

Discussion

There are no formal programs or procedures to determine quantities of hazardous and extremely hazardous chemicals present onsite or to submit updated MSDSs for NPR-3 to the local emergency planning committee, the Natrona County Emergency Management Agency (EMA), and the Wyoming Emergency Management Agency for hazardous chemicals present in amounts above regulatory thresholds. JBEC has provided the EMAs with Tier II reports and a map of the locations where MSDSs and materials are present at the site (A-79 and A-80). However, there are no formal procedures to prepare updates (I-A-13 and I-A-14) that would inform the EMAs of new chemicals or chemicals that are no longer present at the site. There are several known hazardous chemicals for which MSDSs are not available (I-A-12, I-A-14, and I-A-27) (see Finding TCH/CF-1), and there is no documentation to show that a list of these substances has been provided to the EMAs. NPOSR-CUW does not have an integrated chemical tracking system that would assist in determining if hazardous or extremely hazardous chemicals are present in threshold planning quantities.

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) partially identified this finding. Neither self-assessment mentioned the need for procedures to track chemicals for EPCRA reporting.

The apparent causal factors for this finding are inadequate policy and procedures to ensure compliance with hazardous chemical reporting requirements; change in site organization and operations involved in collecting data and reporting; and an inadequate level of personnel knowledge and experience in EPCRA reporting.
Concern has been expressed by Environmental Subteam members who visited NOSR-3 that the Anvil Points shale pile may collapse due to the natural force of erosion in West Sharrard Gulch. This concern was previously expressed by the 1988 Environmental Survey team. The possible ramifications of such a collapse include violations of Section 311 and/or Section 404 of the Clean Water Act.

The shale pile consists of both raw oil shale fines generated in the crushing process and spent shale from the retorting process at the Anvil Points Facility. In January 1979, it was discovered that combustion had initiated in the raw fines pile and a small amount of shale oil was observed flowing from the base of the pile. To prevent the release of this material to West Sharrard Creek, a ditch and evaporation pond were constructed at the base of the pile to collect this leachate and to collect storm water runoff from the shale pile. Recent observations indicate that the combustion in the shale pile has greatly diminished since 1983. During site inspections by the Environmental Subteam, heat was felt at the vent holes in the shale pile indicating that combustion may still be occurring in the shale pile.

A number of studies have been conducted on the shale pile to estimate the potential migration of contaminants to surface water and to groundwater. These studies generally concluded that the constituents in the shale pile are relatively immobile in the environment and for the most part would remain in the pile. Analysis of the surface water and groundwater in the area of the shale pile is ongoing. The validity of these data is in question because of the lack of sampling procedures, preservation techniques, and the general lack of quality assurance and quality control (see Findings QA/CF-4, 5, 11, and GW/CF-3).

40 CFR 300.420, "Remedial site evaluation," states that a remedial preliminary assessment (PA) "shall consist of a review of existing information about a release such as information on the pathways of exposure, exposure targets, and source and nature of the release." The PA of the shale pile, prepared in June 1992 (IWS-S), indicated that "41 feet of the berm had eroded to a point where spent shale had been exposed to the stream side of the berm" and that "West Sharrard Creek has eroded into the berm at the toe of the pile and exposed an area of waste shale, which, if left alone, could possibly slump into the stream bed itself. Such an occurrence would pose both surface water and soil/sediment contamination problems in the area." Although the potential for contamination was clearly defined in the PA, there was no recommendation for further action.

The first portion of the shale pile that would fall into the stream bed is the berm created to divert leachate and runoff from the pile into the lined pond. During the Environmental Subteam site inspections, a sheen of oil was observed in the lined pond that apparently originated from leachate or storm water runoff. Without the benefit of the berm, oil of any kind generated from the shale pile could flow directly to West Sharrard Creek. Should portions of the raw fines pile (where combustion may still be occurring) discharge into West Sharrard Creek, the potential for oil contamination would be greater. Section 311 of the Clean Water Act states "there should be no discharges of oil or hazardous substances into or upon the navigable waters of the United States."
3.5.9 National Environmental Policy Act

3.5.9.1 Overview

The purpose of the National Environmental Policy Act (NEPA) portion of the Environmental Subteam assessment at NPSR-CUW was to: (1) evaluate the NEPA management structure and NEPA review processes; (2) identify inappropriate procedures and inadequate NEPA documentation; (3) evaluate compliance with NEPA, Council on Environmental Quality (CEQ) regulations, and DOE NEPA Regulations, Orders, guidance, and memoranda; and (4) evaluate the adequacy of guidance and oversight from the Assistant Secretary, Office of Fossil Energy (FE-I) and the Assistant Secretary for Environment, Safety, and Health (EH-I). Table 3-11 lists the regulations and requirements used to evaluate NEPA compliance. The new DOE NEPA regulations are cited in the performance objectives; however, the findings would be the same whether the old NEPA guidelines or the new NEPA regulations are used.

The primary focus of the NEPA assessment was activities at NPR-3. There was a review in Casper of NOSR-1 and NOSR-3 documents related to NEPA activities, and there was onsite verification by one of the NEPA specialists during his field work at NOSR-1 and NOSR-3. Because there has been no development of the resources at NOSR-2 in Utah, that site was not included in the NEPA assessment.

The NEPA assessment included interviews, document reviews, and onsite verification. Interviews were conducted with the DOE/NPSR-CUW and JPEC personnel responsible for NEPA compliance, finance, facilities, projects, production, maintenance, program management, and project leadership. Documents were reviewed for adequacy in the following areas: (1) compliance with environmental laws, regulations, and guidelines; (2) technical content; and (3) suitability for reference or tiering. Onsite verification of NPSR-CUW activities was used to determine whether projects (e.g., oil field operations, maintenance, and construction) have been implemented with approved NEPA documents, and whether NPSR-CUW activities and resultant impacts are consistent with those described in the NEPA documents.

DOE/NPSR-CUW NEPA documents provided to the Tiger Team for review included: (1) the August 1990 Environmental Assessment (DOE/EA-0442), "Continued Development of Naval Petroleum Reserve No. 3"; (2) the May 1991 Environmental Assessment (DOE/EA-0531), "Proposed Natural Gas Protection Program for Naval Oil Shale Reserves Nos. 1 and 3"; and (3) 25 categorical exclusions, 20 of which are still in the approval process and 5 of which have unauthorized signatures and thus are not valid NEPA determinations. An additional nine projects were determined by DOE/NPSR-CUW to be covered in their existing Environmental Assessments (EAs).

FE-I has oversight responsibility for the DOE/NPSR-CUW NEPA program. Currently, the authority for determining and documenting the level of NEPA documentation required for those proposed actions that are listed in Subpart D of DOE NEPA Regulations (and recommending the level of review for non-Subpart D actions) lies with FE-I. The DOE/NPSR-CUW Environmental Specialist acts as the central point for NEPA review, document preparation, and recordkeeping.
DOE/NPOSR-CUII procedures for NEPA review and documentation are currently in draft form. Formal NEPA review of DOE actions has only been required since March 1, 1992 (N-25 and N-26). These actions generally consist of development drilling, construction of production facilities, and operations and maintenance (O&M) activities. O&M activities account for approximately 75 percent of NPOSR-CUII expenditures. Development activities are conducted under Job Orders, which are prepared by JBEC and approved by DOE/NPOSR-CUII. O&M activities are conducted under informal work orders. Neither Job Orders nor work orders receive NEPA review by the DOE/NPOSR-CUII Environmental Specialist or the JBEC Environmental Manager. Moreover, the DOE/NPOSR-CUII Environmental Specialist has only recently been included in planning meetings. Currently, the JBEC Environmental Manager is a member of the Planning, Evaluation, and Control Committee. However, the JBEC Environmental Manager did not participate in the April Strategic Planning Meeting or in the drafting of the Long-Range Plan.

The site is not in compliance with, and has a minimal understanding of, NEPA. It was assumed that actions were documented in a 1976 Environmental Impact Statement (EIS) prepared by the Department of the Navy, or in the 1990 and 1991 DOE EAs. However, the 1976 EIS cannot be used to document ongoing or proposed actions because it was never formally adopted by DOE. Moreover, it is out-of-date and does not address current activities. Where appropriate, it can be used as a reference document. The 1990 and 1991 DOE EAs can be used to document proposed actions, as long as the proposed action is included in the EA and the impacts are adequately described.

National Environmental Policy Act requirements were not within the scope of the 1988 Environmental Survey.

While DOE/NPOSR-CUII and JBEC are not currently in compliance with NEPA requirements, most of the personnel recognize that their activities require DOE NEPA review and determination, probably as a result of the recent self-assessments. However, there is incomplete understanding and confusion about the implementation of, and responsibilities for, the NEPA requirements. The DOE/NPOSR-CUII Environmental Specialist is developing NEPA procedures and plans to provide guidance and training to DOE/NPOSR-CUII and JBEC personnel. But, unless NPOSR-CUII management makes a commitment to compliance with NEPA and provides leadership and support, acceptance and integration of NEPA early into the planning process will be slow.

The NEPA assessment resulted in five compliance findings. These findings concern completion of NEPA review, determination, and documentation prior to initiation of actions; NEPA policies and procedures; adequacy of NEPA documents; implementation of NEPA in the project planning and budgeting processes; and recordkeeping and tracking.

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**TABLE 3-11**

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3.5.9.2 Compliance Findings

FINDING NEPA/CF-1: National Environmental Policy Act (NEPA) Review, Determination, and Documentation

Performance Objective

DOE 5440.1D, "NEPA," Section 7.a(12) and (14), states that the responsibility for determining the appropriate level of NEPA review lies with the Secretarial Officers or EH-1.

Finding

Most DOE actions reviewed by the Tiger Team at NPOSR-CUII were implemented without a NEPA review or determination by FE-1/EH-1 of the level of NEPA documentation required.

Discussion

At NPOSR-CUII, failures to make appropriate NEPA determinations have occurred in the following ways: (1) actions do not receive NEPA review because they are incorrectly assumed to be covered by the existing Environmental Assessments (EAs) (N-10 and N-27); and (2) actions proceed with unauthorized determination. Actions also have proceeded without any NEPA determination.

Incorrect NEPA Determinations

Letters were found in the files that gave approval to perform proposed actions based on DOE/EA-0442 (N-27) and DOE/EA-0531 (N-10). This is an acceptable procedure to follow. However, in the following cases, the activities were: (1) not described in the EA (e.g., Run Cement Bond Logs to Comply with Wyoming Oil & Gas Conservation Commission (WOGCC) Rules and Regulations) or (2) the effects of the proposed activity are not adequately described in the EAs (e.g., Installation of Steam Generator No. 5; Drilling and Installing four Infill Wells for Steam Generator No. 4; and Installation of Wasatch Dehydration Units, Well Nos. 1-M-20, 2-M-21, and 3-M-29 at the NOSRs) (see Finding NEPA/CF-3).

Unauthorized Determinations

NEPA categorical exclusion determinations were signed by NPOSR-CUII for seven proposed actions. Only FE-1 has the authority to make NEPA determinations and at present, this authority cannot be delegated to the site.

Actions without NEPA Determinations

A number of activities are near completion or have progressed through detailed design without NEPA determinations from FE-1. For example, the Water Source Well project is 98 percent complete and the Workover Program is ongoing (1-N-15). In addition, for about 50 percent of the facilities projects, detailed design is in progress or has been completed (N-8; 1-N-5). At present, additional work on these projects is awaiting NEPA approval (requests for categorical exclusions have been submitted to FE-1). To avoid such delays, NEPA review and submittal of categorical exclusions requests to FE-1 should be coordinated with the conceptual design stages of project planning (see Finding NEPA/CF-4).

Currently, management and operating (M&O) activities lack NEPA documentation, as required by the DOE NEPA Regulations (10 CFR 1021.102), but the DOE/NPOSR-CUII Environmental Specialist is developing consolidated categorical exclusions (I-N-1) which, once approved, will provide NEPA coverage for routine activities with no potential for environmental effects.

The DOE/NPOSR-CUN self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified the lack of NEPA review, determination, and documentation for proposed actions.

The apparent causal factors for this finding are inadequate site policy for NEPA review and documentation; incomplete policy implementation of DOE regulations and Orders; and inadequate training by the FE NEPA Compliance Officer (NCO) of site personnel to familiarize them with the requirements of NEPA and related laws; a secondary contributing factor for this finding is inadequate appraisals/audits/reviews by FE.
FINDING NEPA/CF-2: National Environmental Policy Act (NEPA)
Performance Objective

DOE 5440.1D "NEPA," 7.x(2), 7.c(3), and 7.d(4), and DOE 4700.1, "Project Management System," Part I, establish requirements and guidance for written procedures to ensure consistency in the agency-wide application of NEPA and compliance with the Council on Environmental Quality regulations. DOE 5480.19, "Conduct of Operations Requirements for DOE Facilities," Section 4.b, requires operators of DOE facilities to have procedures in place to control the conduct of their operations.

Finding

There are no formal procedures for implementation of NEPA at NPOSR-CUW.

Discussion

There are no formal procedures for the implementation of NEPA at NPOSR-CUW, but the site personnel are currently attempting to comply with NEPA in the absence of written NEPA procedures. The DOE/NPOSR-CUW Environmental Specialist is currently preparing guidance defining the roles and responsibilities and lines of authority for the conduct, management, review, and oversight of NEPA compliance activities for the site. Subsequently, JBEC will develop formal procedures for implementation of a NEPA compliance program (N-2). A memorandum (N-25) and a letter (N-26) outlining the DOE policy for NEPA compliance was sent to the site on February 20, 1992. On June 15, 1992, DOE/NPOSR-CUW received "Procedures for Preparing/Submitting Categorical Exclusions" (N-28) from Office of Fossil Energy (FE). Apparently, this latter document is the only guidance that DOE/NPOSR-CUW has received from FE.

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified the lack of procedures to manage, review, conduct, and oversee NEPA compliance activities.

The apparent causal factors for this finding are inadequate policy implementation of DOE NEPA regulations and orders and inadequate training by DOE/NPOSR-CUW and the FE NEPA Compliance Officer of the site personnel. A secondary contributing factor for this finding is inadequate FE appraisals/audits/reviews.

FINDING NEPA/CF-3: Adequacy of National Environmental Policy Act (NEPA) Documents

Performance Objective

Council on Environmental Quality (CEQ) regulations require an Environmental Assessment (EA) to identify environmental effects and values in adequate detail (40 CFR 1501.2(b)) and provide sufficient evidence and analysis for determining whether to prepare a finding of no significant impact (FONSI) or an Environmental Impact Statement (EIS) (40 CFR 1508.9(a)(1)). DOE guidance states that radiological and nonradiological impacts to workers should be considered in NEPA documents (Office of NEPA Oversight memorandum "Guidance Related to Analysis of Impacts to Workers in NEPA Documentation," June 10, 1988).

Finding

The 1990 EA, "Continued Development of Petroleum Reserve No. 3" (DOE/EA-0442), and the 1991 EA, "Proposed Natural Gas Protection Program for Naval Oil Shale Reserves Nos. 1 and 3" (DOE/EA-0531), are inadequate when judged against the requirements of 40 CFR 1501.2(b), 40 CFR 1508.9, and DOE guidance dated June 10, 1988, regarding impacts to workers.

Discussion

Both EAs referenced in this finding (N-10 and N-27) are deficient in their description of the proposed action, the existing environment, and impacts; thus reducing their usefulness for tiering and referencing in accordance with 40 CFR 1502.20 and 1502.21. These include the following deficiencies:

The proposed action is not described in sufficient detail to determine which future actions are covered. Neither EA describes routine maintenance, operation, decommissioning and decontamination of the facilities. The description of the proposed action is not clear in some instances, such as whether the proposed action in DOE/EA-0442 (N-27) is for installation of Steam Generators 3, 4, 5 and 6, or just for their "planning."

There is no description of wetlands (such as the wetland vegetation in the stream bottom along the Teapot and Little Teapot Creeks) in DOE/EA-0442 (N-27). The description of wetlands in DOE/EA-0531 (N-10) is incomplete, since it does not identify the wetlands in water retention ponds, beaver ponds, and streams.

There is no discussion of worker impacts in either of the EAs.

There is no description of the impacts on the environment and health due to the change in hydrogen sulfide emissions resulting from the proposed action.

There is no description of noise impacts in DOE/EA-0531 (N-10).

The DOE/NPOSR-CUW self-assessment (April 1992) did not evaluate the NEPA documents. The JBEC self-assessment (April 1992) partially identified this finding, in that the inadequate wetlands description was noted.
The apparent causal factors for this finding are the lack of policy implementation of DOE NEPA policies by NPOSR-CUW and inadequate training on document preparation by DOE/NPOSR-CUW and the FE NEPA Compliance Officer.

FINDING NEPA/CF-4: Project Planning and Budget Review

Performance Objective

The Council on Environmental Quality regulations (40 CFR 1501.2), DOE NEPA Regulations (57 FR 15122, Sections 1021.101 and 1021.200(a) and (b)); DOE 5440.1D, "NEPA," Section 7.4(l), "National Environmental Policy Act Compliance Program"; and DOE 4700.1, "Project Management System," Part F, require the integration of the NEPA process with project planning at the earliest possible time to ensure that decisions reflect environmental values and to avoid delays. Moreover, DOE 5440.1D, Section 7.4(5); DOE 5700.7B, "Work Authorization System"; and DOE Notice 5100.3, "Field Budget Notice," require the incorporation of NEPA milestones and financial planning into project planning documents, and the inclusion of NEPA compliance activities and status reports in internal budget reviews.

Finding

NPOSR-CUW does not apply NEPA early in the planning process for proposed DOE actions as required by 40 CFR 1501.2, DOE NEPA Regulations, DOE 5440.1D, DOE 4700.1, DOE 5700.7B, and DOE Notice 5100.3. NEPA milestones and financial planning are not included in project planning documents and Job Orders as required. Thus, these documents do not ensure valid, early consideration of environmental issues.

Discussion

The primary early project planning and budgeting documents used at NPOSR-CUW are the Long Range Plan (N-3) and the Annual Operating Plan (N-4). Consideration of the NEPA process early in planning is inadequate because NEPA is not explicitly considered in these documents. The 1988 Environment, Safety and Health Long-Range Plan (N-29) noted that three Environmental Assessments may be required, one for each new steam generator planned for FY 1990, 1991, and 1992. These steam generators were subsequently included in the 1990 DOE/EA-0442 (N-27). However, the description of the generators in the 1990 Environmental Assessment was not adequate (see Finding NEPA/CF-3).

Development activities have not received environmental review at the conceptual design stage as required by DOE 4700.1. It was clear from almost all of the interviews and from various project planning schedules (N-4, 5, 6, and 7) that neither DOE/NPOSR-CUW nor JEC personnel understand the relationship of the NEPA process (i.e., review, determination, and documentation) and project planning as described in DOE 4700.1. NEPA requirements have been dealt with as issues arise.

Successful integration of NEPA depends on communication between the person(s) responsible for NEPA and the project managers. The DOE/NPOSR-CUW Environmental Specialist was not included in the April 1992 Strategic Planning Meeting, nor was he included in the weekly staff meetings held by DOE/NPOSR-CUW or JEC (I-N-1 and I-N-8) until June 1992. Input from the NPOSR-CUW NEPA specialists early in the planning stages of projects is necessary to ensure compliance and to avoid future needless delays. Generally, NEPA has either not been considered at all or is considered late in project development (see Finding NEPA/CF-1).
The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified the lack of early planning for NEPA and the lack of milestones and financial planning for NEPA in project planning documents.

The apparent causal factors for this finding are a lack of policy implementation for integrating NEPA with project management; a lack of NPOSR-CUW procedures for compliance with NEPA; inadequate training by the FE NEPA Compliance Officer (NCO) of site personnel. A secondary contributing factor for this finding is inadequate DOE-HQ/FE appraisals/audits/reviews.

FINDING NEPA/CF-5: Recordkeeping for National Environmental Policy Act (NEPA) Documentation

Performance Objective
DOE 5440.1D, "NEPA," Sections 7.a(2) and 7.c(3), requires procedures and recordkeeping to ensure consistency in the agency-wide application of NEPA. DOE 4700.1, "Project Management System," requires a disciplined, systematic, and coordinated approach to project management that results in efficient planning, organization, coordination, budgeting, management, review, and control of DOE actions. DOE 1324.8, "Records Management Program," Section 6.b(2), requires that departmental records be maintained in an effective, efficient, and authorized manner. Best management practices suggest that integrated tracking procedures be in place for NPOSR-CUW to follow the status of NEPA review.

Finding
There is no recordkeeping such that the status of NEPA compliance in the planning, funding, approval, design, and construction phases of all NPOSR-CUW actions can be determined. There is also no integrated tracking system at NPOSR-CUW in accordance with best management practices (I-N-1).

Discussion
NPOSR-CUW NEPA files are incomplete, scattered, and poorly cross-referenced. For instance, NPOSR-CUW did not provide a copy of the Finding of No Significant Impact for either DOE/EA-0442 (N-10) or DOE/EA-0531 (N-27), or the two primary NEPA documents for future proposed actions at NPR-3, NOSR-1, and NOSR-3. Therefore, the documents were provided by the Tiger Team.

Best management practices for an integrated tracking system do not exist at NPOSR-CUW (I-N-1 and I-N-4). There is no system evaluating the progress of actions in relation to NEPA milestones. Additionally, the site does not track the status of individual NEPA documents submitted for review and approval (i.e., a system that tracks the NEPA document from JBEC, to DOE/NPOSR-CUW, FE-64, FE-1, and EH-1, then back to the originator, as appropriate). Thus, NPOSR-CUW and JBEC managers cannot readily ascertain when NEPA determinations or NEPA documents have been approved and, therefore, when actions may be implemented. As a result, the potential exists for actions to proceed to the detailed design (i.e., after conceptual design) stage prior to authorized approval by FE-1 or EH-1 (see Finding NEPA/CF-1).

The DOE/NPOSR-CUW self-assessment (April 1992) and the JBEC self-assessment (April 1992) fully identified the lack of recordkeeping and tracking.

The apparent causal factor for this finding is a lack of policy implementation for recordkeeping and tracking NEPA review of projects.
4.0 SAFETY AND HEALTH ASSESSMENT

4.1 PURPOSE

The purpose of the Safety and Health (S&H) Subteam assessment was to determine the effectiveness of site safety and health programs at the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW). A Technical Safety Appraisal (TSA) team (also referred to as the Safety and Health [S&H] Subteam) was assembled for this purpose by the Department of Energy (DOE) Deputy Assistant Secretary for Safety and Quality Assurance, Office of Performance Assessment. The S&H Subteam assessment was performed concurrently with assessments conducted by the Environmental and Management Subteams.

4.2 SCOPE

Within the safety and health programs of NPOSR-CUW, performance was appraised in the following technical areas: Organization and Administration, Quality Verification, Operations, Site/Facility Safety Review, Maintenance, Technical Support, Training and Certification, Packaging and Transportation (including pipeline safety), Occupational Safety, Worker Safety and Health (Occupational Safety and Health Administration [OSHA]) Compliance (including a compliance inspection), Fire Protection, Emergency Preparedness, and Medical Services. Three of the four locations which comprise NPOSR-CUW were visited during the assessment. Naval Petroleum Reserve Number 3 (NPR-3) near Casper, Wyoming and Naval Oil Shale Reserve Numbers 1 and 3 (NOSR-1 and NOSR-3) near Rifle, Colorado were examined. Naval Oil Shale Reserve Number 2 (NOSR-2) near Vernal, Utah was not visited as it is an inactive DOE property.

4.3 APPROACH


The S&H Subteam assessment was conducted from June 22 through July 15, 1992. Guidance and direction were provided by the Director, Office of Performance Assessment. A list of the Subteam members together with their areas of responsibility is provided in Section 4.9; biographical sketches of the Subteam members are provided in Appendix A-3.

The TSA focuses on safety of operations and the condition of equipment and facilities. This approach is based on the assumption that the facility and its equipment have been appropriately designed and constructed. Each appraisal addresses whether current operations are being conducted within the scope of operational safety procedures and programs established for specific facilities and activities.

The activities of the S&H Subteam were guided by the performance objectives and supporting criteria contained in DOE/EH-0135 "Performance Objectives and Criteria for Technical Safety Apraisals at Department of Energy Facilities and Sites," dated June 1990. A Performance Objective and Criteria for "Aviation Transportation" was added to the Packaging and Transportation

Section based on the existing Performance Objectives and Criteria for Aviation Safety.

The findings and resulting concerns identified by the S&H Subteam were developed using established performance objectives for each of the technical areas evaluated. Although nearly all of the performance objectives addressed in this report cite only those objectives for which a concern was identified. Those performance objectives that are not applicable are identified in the Overviews. Therefore, the reader must search for the objective addressing the safety and operational performance within an area without first reading the Overview concerning that area. When an applicable performance objective is not listed, the omission implies that the Subteam judged all significant criteria to be met.

The findings and concerns identified by the S&H Subteam were obtained in three ways:

1. observing routine operations, emergency exercises, and the physical condition of the site and facilities;
2. interviewing management, staff, operators, and policy personnel; and
3. reviewing policies, procedures, and other relevant documents.

In addition, the DOE/NPOSR-CUW Site Office Self-Assessment Report and the Johns Brown Engineers and Constructors Inc. (JBE) Self-Assessment Report were reviewed.

A concern addresses a situation that in the judgment of the S&H Subteam either (1) reflected less than full compliance with a DOE safety and health requirement or mandatory safety standard; (2) threatened to compromise safe operations; or (3) if properly addressed, would substantially enhance the excellence of a particular situation, even though that part of the operation was judged to have a currently acceptable margin of safety. Because this last category addresses the excellence of operation, more concerns are reported than would result from a strictly compliance-oriented appraisal.

The findings that support each concern immediately precede the concern. The category rating, potential hazard level, and level of compliance for each concern were determined by using the criteria presented in Section 4.7.

A comprehensive OSHA-type compliance appraisal covering general industry and construction work sites was performed. The scope of this appraisal involved major process, service, production and maintenance facilities. This part of the appraisal effort focused on "serious" noncompliance issues rather than on those designated as "other than serious." Furthermore, de minimis issues noted during the appraisal are not included in the inspection forms.

The Subteam also evaluated NPOSR-CUW in terms of the presence of any Noteworthy Practices. Noteworthy Practices are exceptional ways of accomplishing a Performance Objective. Other DOE facilities are encouraged to adopt such practices when they are applicable to their operation.

Drawing upon the extensive experience of its appraisers, the S&H Subteam has made an effort to identify some of the responsible factors in each statement of concern. However, the Subteam recognizes that this effort has limitations, because Subteam members are not fully familiar with the details of the day-to-day operations of NPOSR-CUW. Therefore, the S&H Subteam believes that the findings, and even the statements of concern, should be considered as possibly symptomatic of some set of deeper root causes. Therefore, the Office of
Fossil Energy (FE), DOE/NPOS-R-CUW, and JBEC management should search out and correct those root causes to ensure that improvements in the safety of the operation will be sustained.

4.4 SAFETY AND HEALTH ASSESSMENT SUMMARY

There is a heightened awareness of safety throughout the JBEC organization. However, JBEC has not fully communicated its expectations for safety improvement and has not provided sufficient leadership, strategy, and training to assist employees in achieving an overall improved safety culture. JBEC management has not developed the necessary tools such as SH & QA plan, goals, performance standards, and an institutionalized Quality Assurance (QA) program to communicate and implement the NPR-3 SH & QA Program. Both JBEC and DOE/NPOS-R-CUW management have failed to require the implementation of the SH & QA provisions of the DOE operating contract with JBEC. DOE Orders 5700.6C and 5700.6D require that the Site Office provide oversight of JBEC safety and health programs and associated activities. These deficiencies have resulted in the failure to develop an SH & QA program appropriate to the site's particular needs.

A total of 110 concerns is identified in this Safety and Health Section; 90 concerns pertain to JBEC, and 20 concerns to DOE/NPOSR-CUW. There are 11 Category II Concerns: 3 relate to meeting the safety and quality provisions of the operating contract and DOE/NPOS-R-CUW oversight issues in Organization and Administration; 3 relate to Maintenance problems with work practices, oversight, and support; 4 relate to Occupational Safety and Health non-compliance and deficiencies in confined space entry, workplace hazards, evaluation and control, electrical safety, and control of hazardous energy; and 1 relates to Fire Protection involving potential excess property losses. A Tabulation of Concerns from this appraisal is contained in Section 4.8.2.

Table 4-1 provides a comparison between findings resulting from the combined DOE/NPSR-CUW and JBEC Self-Assessments and those concerns identified during the Site Office's appraisal. A comparison of the total concerns identified during the TSA to those identified in the combined Self-Assessments indicates that 82 percent of the TSA Category II Concerns and 80 percent of the Category III Concerns were either fully or partially identified by the combined Self-Assessments.

Neither DOE/NPOS-R-CUW nor JBEC have implemented QA programs as required by DOE 5700.6C and the provisions of the DOE operating contract with JBEC. Draft QA Manuals have been prepared and submitted to the DOE Office for review and approval. The Site Office has not prepared a plan describing how it will implement its own QA Program or how it will provide oversight of the existing contractor QA Program. The general plan is to use Total Quality Management (TQM) as the QA implementing tool; however, the specific details for the implementation process have yet to be defined. Successful implementation of a JBEC QA Program will be dependent on management's ability to apply a graded approach to the site's quality-related activities utilizing existing resources. JBEC lacks the necessary training, audit, and appraisal programs to ensure safety awareness throughout this operation. JBEC Operations does not effectively interface with Engineering to ensure sound safety principles in the selection, implementation, and operation of equipment. Operators do not have approved Operation Procedures to guide performance of their duties and do not effectively monitor the operating condition of their equipment. As a result, certain facilities and drilling equipment are not being operated in a safe and reliable manner; the Lock, Tag, Try Procedure is incomplete and not effectively implemented; and requirements regarding the use of blowout preventers during well workovers are not followed.

Observations of maintenance activities indicated personnel were qualified to perform maintenance work. The site was maintained in a neat, orderly condition and had high on-stream equipment availability. However, the Maintenance organization has not ensured implementation and control of maintenance activities and has not ensured that sufficient safety and engineering support is provided for maintenance operations. The Maintenance organization has not maintained the material condition of components and equipment in a manner sufficient to prevent hazardous conditions caused by code-noncompliance, improper operation of equipment, and equipment deterioration. Other significant deficiencies noted were a backlog of electrical parts, use of outdated drawings, lack of written procedures, and lax enforcement of informal procedures resulting in hazardous conditions and unsafe practices.

Safety and health training for NPR-3 operations, although good by oil field standards, does not meet DOE requirements. JBEC is in a reactive, catch-up training mode, caused to a great extent by lack of direction from DOE/NPOS-R-CUW. Training has been informal with little attention paid to controlling the quality of planning and scheduling, training materials, instructor credentials, and recordkeeping. There is neither a needs analysis based on specific jobs and tasks nor a comprehensive training plan. There is no assurance that training for first-line supervisors and managers has not been provided on a regular basis. Subcontractors often have not had the necessary ES&H training, and neither JBEC nor DOE/NPOS-R-CUW have been effective in monitoring their activities. JBEC recognizes these deficiencies and has been making efforts to improve all aspects of their training program. In addition, a significant amount of ES&H training activities have occurred in the past 6 months.

The existing JBEC and DOE/NPOS-R-CUW Emergency Preparedness Program is in the early stages of development, and lacks a well written emergency management plan, a set of implementing procedures, an exercise/drill schedule, and a documented training program. Despite these deficiencies, JBEC developed a challenging exercise scenario and performed their emergency management and response activities in a satisfactory manner. To date the DOE Office of Fossil Energy has not provided formal oversight and adequate guidance for emergency preparedness program activities at NPR-3.

Technical support to field operations at NPR-3 is provided for reservoir and new construction engineering. However, engineering support for design and installation of facility modifications and for mechanical and electrical problems and maintenance is not provided. DOE/NPOS-R-CUW surveillance has not ensured engineered safety for operations at NPR-3. Engineering personnel located in Casper do not spend enough time in the field.
to provide appropriate support for day to day operations. JBEC does not have an effective configuration control system to ensure that drawings are maintained current as-built. Field work often is carried out without involving engineering personnel to update the drawings. Follow-up work must then be performed without accurate piping and electrical diagrams, creating potential safety problems. NPR-3 facilities are not covered by a Safety Analysis Report (SAR) to serve as the top-level safety document specifying operational limits, physical and administrative controls, safety systems, and surveillance requirements. Further, no formal hazards assessment has been performed, and the full range of accident conditions has not been determined.

The good hazardous materials transportation accident record at NPR-3 can be attributed to few shipments, the low volume of crude oil moved by pipeline, and the constructive attitude of the J BEC staff. A packaging and transportation program for implementing DOE Orders does not exist. Policy and Procedure documents have not been implemented; design standards have not been established; quality control and quality assurance systems have not been instituted; the knowledge of Federal and state laws and regulations is very low; industry standards and practices are followed only in part; internal audits are not performed on a scheduled basis; packaging and storage procedures are incomplete; and no training program is in place. A public road transverses the site, necessitating compliance with Department of Transportation (DOT) 49 CFR, but few are met. The Pipeline Corrosion Protection Program is inadequate and not under the supervision of a qualified individual. The technical staff of DOE/NPOSR-CUW relies excessively on the competency of the J BEC staff; however J BEC demonstrates little knowledge with respect to DOE Orders. The result is that the degree of risk is unknown, and the current safety record is in jeopardy.

JBEC is required by DOE Orders to have an internal safety review system that ensures comprehensive and indepth appraisals of facility safety. It was noted that J BEC does not perform periodic safety and health appraisals of the operations of each facility and has not conducted independent triennial appraisals of its safety and health review system. Furthermore, DOE/NPOSR-CUW has not provided oversight to ensure that J BEC has fully implemented the requirements for internal safety reviews and appraisals.

J BEC management is not fully complying with DOE and OSHA worker safety and health requirements. This is evident by the lack of an effective, proactive compliance-oriented safety and health program. J BEC safety policies and procedures are informal, lack specificity, and are not uniformly distributed or enforced for all employees and subcontractors. The lack of an aggressive training program for specific safety reviews of worksites has hindered the achievement of full compliance with DOE Orders and OSHA regulations. Serious concerns were specifically identified in electrical systems, lockout/tagout practices, and equipment guarding.

Neither DOE/NPOSR-CUW nor J BEC has developed a Fire Protection Policy. Responsibilities, authorities, and accountabilities are not well-established and clearly understood by personnel for credible fire scenarios. The method of interfacing with offsite emergency agencies also is not well defined. There is no formal program or implementing procedures to comply with National Fire Protection Association (NFPA) Standard 101, "Life Safety Code." No Fire Hazard Analysis or SAR addresses the potential of offsite releases of hazardous materials. The newly created Emergency Response Team (ERT) concept is common to the petroleum industry. However, the new ERT group at NPR-3 has not received sufficient training to respond to site emergencies and is not provided with the required personal protective equipment. The Low Temperature Separation (LTS) Gas Compressor Building and liquid storage tanks are not protected by deluge type sprinkler systems as required by DOE 5480.7. J BEC does not have a program to conduct fire protection engineering surveys.

J BEC does not have a comprehensive medical services program for its employees as required by DOE 5480.8. Major deficiencies include the elements of administration, physical examination, recordkeeping, and employee assistance and wellness programs. The existing limited program is administered by a local physician who is neither trained in current occupational medicine practices nor totally familiar with the J BEC work environment. The physician performs pre-employment exams, lung function tests for the respiratory protection program, and care for job incurred injuries on a fee for services basis. Neither J BEC, the medical provider, nor DOE site management were aware of the requirements of DOE 5480.8 or all pertinent OSHA regulations requiring medical surveillance.

An occupational safety and health program is in place at NPR-3 which applies a line management safety approach. Systems such as facility inspections, deficiency tracking and reporting, safety meetings, permit process, and others have been implemented to apply the program. The line organization demonstrates interest in safety; however, the program has had only partial success in controlling hazards and achieving compliance with safety and health requirements of DOE Orders and OSHA standards. Hazard identification, evaluation, and control is a particular deficiency in the J BEC program. Specific deficiencies in confined space entry, lockout/tagout, hydrogen sulfide hazard control, eyewash stations, and practices regarding working alone are exacerbated by the lack of effective hazard evaluation.

Causes for the limited effectiveness in the J BEC Safety and Health Program begin with DOE/NPOSR-CUW, which has failed to direct J BEC to implement safety and health requirements. DOE/NPOSR-CUW also has not provided oversight and guidance for the Safety and Health Program. Likewise, J BEC management has failed to understand its Safety and Health Program obligations, plan for their implementation, and establish proportionate organizational systems and resources to communicate and apply an effective program. To achieve improvement in the Safety and Health Program, DOE/NPOSR-CUW must clearly communicate its expectations and requirements to the operating contractor and follow through with the necessary guidance, support, and oversight to ensure proper implementation. In addition, the operating contractor must establish the organization, allocate resources, and develop systems to fulfill the expectations and requirements delineated by DOE/NPOSR-CUW.
TABLE 4-1

COMPARISON OF SELF-ASSESSMENT PROBLEM IDENTIFICATION WITH TSA CONCERNS

<table>
<thead>
<tr>
<th>TSA DISCIPLINE</th>
<th>CATEGORY II</th>
<th>CATEGORY III</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>SELF</td>
<td>TSA</td>
</tr>
<tr>
<td><strong>Organization &amp; Administration</strong></td>
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<td>3</td>
</tr>
<tr>
<td><strong>Quality Verification</strong></td>
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<td>2</td>
</tr>
<tr>
<td><strong>Operations</strong></td>
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<td>8</td>
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<tr>
<td><strong>Maintenance</strong></td>
<td>3</td>
<td>3</td>
</tr>
<tr>
<td><strong>Training &amp; Certification</strong></td>
<td>6</td>
<td>6</td>
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<tr>
<td><strong>Packaging &amp; Transportation</strong></td>
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<td>13</td>
</tr>
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<td><strong>Emergency Preparedness</strong></td>
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<td>9</td>
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<tr>
<td><strong>Medical Services</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>Total Concerns (by category)</strong></td>
<td>9</td>
<td>11</td>
</tr>
</tbody>
</table>

1 Concerns partially or fully identified in the self-assessments were counted as identified in this table.

4.5 SAFETY & HEALTH FINDINGS

4.5.1 Organization and Administration

4.5.1.1 Overview

The technical area of Organization and Administration was assessed by reviewing various management documents, making tours of work areas, and conducting interviews with non-supervisory and management personnel at all levels of the DOE/NPOSR-CUW and JBEC organization. All eight of the Organization and Administration performance objectives were reviewed as part of this assessment. These objectives were analyzed based on the nature of operations at NPR-3 and applicable DOE Orders and requirements.

One-on-one discussions with randomly selected JBEC non-supervisory and management personnel indicated a heightened awareness of safety and the desire to work safely. However, most felt that management has not fully communicated its expectations for safety and has not provided sufficient information and training to assist employees in achieving an overall improved safety culture.

DOE/NPOSR-CUW has failed to ensure that JBEC meets the S&H and Quality Assurance (QA) provisions of the DOE operating contract with JBEC. This was the subject of a Category II Concern. DOE Orders and requirements have not been formally transmitted to JBEC in a timely manner due to the lack of a formal directives system and the lack of understanding of the need to convey such information. In addition, DOE/NPOSR-CUW has not established a QA Program for the Site Office as well as ensuring that JBEC has an operating QA Program. The S&H Subteam noted many deficiencies resulting from the lack of DOE/NPOSR-CUW oversight of JBEC safety and health programs and related activities. The specific deficiencies have been documented within the various technical areas of the S&H Subteam report. Insufficient DOE/NPOSR-CUW oversight of JBEC safety and health-related activities has been a significant contributing factor to the lack of properly developed and implemented safety and health initiatives at NPR-3 and thus was cited as a Category II Concern. In addition, it was noted that DOE/NPOSR-CUW has not allocated sufficient resources to support an effective program of oversight of JBEC.

JBEC similarly has failed to adhere to the S&H and QA provisions of its operating contract with DOE and has no mechanism in place to ensure that regular reviews are made to determine compliance with the provisions of the operating contract. This was the subject of a third Category II Concern. JBEC management has not developed the necessary tools such as S&H goals and plans, performance standards, and an institutionalized QA Program to effectively communicate and implement the S&H program at NPR-3.

Annual S&H goals have not been established by management. Safety and health plans describing program requirements and implementation schedules have not been developed. Position descriptions do not provide the individual with a clear definition of his/her S&H responsibilities. Clearly defined performance expectations have not been established as part of the employee performance appraisal process. Management has not developed staffing plans to anticipate and manage impacts resulting from potential funding reductions, attrition, and response to special needs that may arise; for example, the self-assessment findings and concerns.
JBEC has implemented an occurrence reporting system based on DOE 5000.3A. However, reporting requirements for the Notification and 10-Day Reports have not been implemented in accordance with this Order. In addition, DOE/NPOSR-CUW has not consistently met the 3-Day sign-off requirements for Final Reports.

JBEC has established an independent Safety Review Committee that meets monthly to review and discuss current S&H issues. The Committee consists of top level JBEC management and a representative from DOE/NPOSR-CUW. Included on the Committee is the Field Operations Manager, which diminishes the actual independence of the Committee from operations areas reviewed. In addition, the S&H Section conducts quarterly inspections of work areas. Also, various assessments have been conducted by or through JBEC Houston over the past 2 years which included the areas of electrical grounding, fire protection, environmental inspections, emergency preparedness, and safety and health. Supplemental personnel in the areas of environment and safety are currently being provided to JBEC through the Houston office. Corporate support, in general, is supplied to NPR-3 on an as-needed basis within the constraints of budget allocations approved by DOE/NPOSR-CUW.

JBEC has nearly completed its initiative to review and update 373 Policy and Procedure documents. The effort is approximately 85 percent complete and has resulted in the deletion of 44 documents no longer applicable. JBEC has implemented a Policy and Procedure Index that appears effective for tracking these documents through the review and approval process. JBEC has developed a system for controlling revisions to Policy and Procedures that incorporates the return of the outdated sheets to the Policies and Procedures Analyst and an annual independent verification to assure manuals are kept current. JBEC presently uses an informal system for its Operation Procedures (Ops). Activities are just underway to develop Ops as part of the Conduct of Operations initiative at NPR-3. This effort will be more complex than that associated with the review of Policy and Procedures. JBEC, however, has not established a plan for managing and implementing the OP development process.

Presently, no Safety Analysis Reports (SARs) have been developed for NPR-3. DOE/NPOSR-CUW presently is planning to obtain assistance in developing SARs for NPR-3. This is further discussed under Section 4.5.7 Technical Support of this report.

JBEC has established a drug and alcohol abuse policy. That policy does not require formal training of supervisors in the detection and referral of employees suspected of substance abuse. There is no education program for employees regarding substance abuse. In addition, JBEC does not have an Employee Assistance Program in place for employee referral.

JBEC initiated a Performance Indicators and Trending Program in FY 1991. Information is provided quarterly to DOE/NPOSR-CUW in accordance with the reporting categories defined in SEN-29-91. However, this data is neither analyzed for trends nor used to improve the overall margin of safety for NPR-3.

The JBEC self-assessment appeared thorough in scope and quite candid. The self-assessment process was conducted by a relatively few key individuals within JBEC, thus, it did not allow input from all levels of the organization. Deficiencies identified related to the need to develop safety and health programs, the need to develop and apply management tools in carrying out these programs, and a lack of understanding of DOE Orders and requirements. Corrective actions reflected management commitment to correct problems, but in some cases did not indicate a total understanding of the deficiencies identified.

The DOE/NPOSR-CUW self-assessment reflected a lack of understanding of DOE Orders and requirements. In general, the self-assessment consisted of repetitious phrases stating criteria had not been met, followed by a statement indicating these would be met. The proposed corrective actions indicated that the nature of the deficiencies was not well understood by DOE/NPOSR-CUW.
4.5.1.2 Findings and Concerns

OA.1 SITE/FACILITY ORGANIZATION

PERFORMANCE OBJECTIVE: Management should organize and manage the site/facility's work, programs, and resources so that safety and health are an integral part of the personnel duties and requirements are consistently implemented.

FINDINGS:

- Discussions with the JBEC Safety and Health Manager revealed there is no safety and health plan published by JBEC.
- DOE 5480.1B, paragraph B.d.(6) requires the establishment of implementation plans for ESH activities.
- The DOE operating contract with JBEC (DE-AC01-86FE60896) requires that a safety and health plan be prepared within 90 days after the effective date of the contract. Such a plan is to be updated by JBEC annually, thereafter for the remainder of the contract. This contractual requirement has not been met. (See Concern OA.1-4.)
- The following concern was fully identified in the JBEC self-assessment (April 1992).
- The operating contractor has not prepared safety and health plans (OA.1-1) as required by DOE 5480.1B, paragraph B.d.(6) and by its operating contract with the Department of Energy.
- A review of guidance letters from DOE/NPOSR-CUW to JBEC was made. These letters formally requested the contractor to implement specific DOE Orders. It was noted in several instances that JBEC was only recently requested to implement these Orders which have been in effect for considerable periods of time. For example, the letter C. Ray Williams to Michael R. Fosdick, Subject: "Guidance for DOE Order 5480.19. Conduct of Operations Requirements for DOE Facilities," dated February 13, 1992, directed JBEC to implement all 18 chapters of the Order. DOE 5480.19 has been in effect since July 1990. Similar examples were noted with DOE 5480.1B, DOE 5481.1B, DOE 5482.1B, and the DOE 5500-series of Orders.
- DOE/NPOSR-CUW has not established a formal directives system to ensure DOE Orders and requirements are conveyed to JBEC in a timely manner.
- Discussions with DOE/NPOSR-CUW management indicated that until their visit to the Naval Petroleum Reserves in California in 1991, they were not aware of the need to formally transmit applicable DOE Orders to JBEC.

- A review of the recent transmittal letters from DOE/NPOSR-CUW indicated the lack of clear guidance to JBEC. This was substantiated by JBEC personnel who had asked for clarifying information from DOE/NPOSR-CUW on several occasions, but did not receive it. DOE/NPOSR-CUW management indicated this is due to the lack of expertise within the Site Office to provide guidance and interpretation of DOE Orders.
- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not implemented a directives system and has not provided clear and timely guidance to the operating contractor.

FINDINGS:

- The DOE operating contract with JBEC (DE-AC01-86FE60896) contains specific requirements within the Statement of Work for Safety and Health and Quality Assurance.
- Some of the safety and health requirements imposed by the contract include:
  - "The Contractor shall submit for approval in writing, a Health and Safety Plan to the Director, NPOSR-CUW within ninety (90) days after the effective date of the Contract." (The effective date of the contract was October 1, 1986.)
  - "The plan shall be updated by the Contractor and reviewed and approved by DOE when necessary, but no less than once each year, corresponding with the preparation of the Annual Operating Plan for the next fiscal year."
- These contractual requirements were not met by JBEC and not enforced by DOE/NPOSR-CUW.
- Some of the quality assurance requirements imposed by the contract include:
  - "The Contractor is responsible for establishing, maintaining and operating an approved Quality Assurance (QA) Program in accordance with the direction given in NPOSR Order 5700.6A."
  - "The Contractor's QA Program shall be integrated into daily operations..."
These contractual requirements were not met by JBEC and not enforced by DOE/NPOSR-CUW.

- Discussions with both DOE/NPOSR-CUW and JBEC management indicated there has been no mechanism established to ensure that a regular review of the contract is performed and that its Safety and Health and Quality Assurance provisions are being met.

- The following concern was not identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not enforced the safety and health and quality assurance provisions of the Department of Energy operating contract with the operating contractor.

FINDINGS: The following concern was not identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not have a mechanism in place to ensure that the safety and health, and quality assurance provisions of its operating contract with the Department of Energy are met.

FINDINGS: The position description for the Director, Contract Surveillance and Administration states the incumbent is responsible for safety and health. These responsibilities include developing, implementing, and evaluating safety and health programs and conducting surveys and inspections. The Unit Charter for the DOE/NPOSR-CUW Contract Surveillance and Administration organization provides for the use of engineers in the Site Office to perform oversight of occupational safety and health activities and to report their findings to the Director. It is not clear how these responsibilities and authorities are assigned and managed within the framework of the matrix organization being used.

- The Director, Contract Surveillance and Administration performs his safety and health responsibilities only as a collateral duty, responding to issues only as they arise. Thus, he devotes little time, if any, to developing, implementing, and evaluating safety and health programs for the Site Office and JBEC as required by his position description.

- The responsibility for safety and health is shown differently on the various DOE/NPOSR-CUW organization charts reviewed by the SAM Subteam. In some cases, the functional responsibility for safety and health is not shown at all.

- The lack of clearly assigned responsibilities for safety and health has contributed to deficiencies associated with implementing the safety and health and QA provisions of the DOE operating contract with JBEC as well as a directives system needed to ensure DOE Orders and requirements are properly implemented. This lack of clearly assigned responsibilities is not in accordance with DOE 5480.1B, paragraph 8.d.(6)(a]).

- See Concerns OA.1-2, OA.1-3, MA.1-1, EP.1-1, EP.1-2, PT.1-1, OS.1-2, FP.1-1, and FP.1-2.

- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: The organizational structure, responsibilities, and authorities for safety and health have not been clearly established by DOE/NPOSR-CUW Site Office in accordance with DOE 5480.1B, paragraph 8.d.(6)(a]).

FINDINGS: During the course of this Tiger Team Assessment, the SH Site Office Subteam identified numerous serious deficiencies associated with the lack of effective DOE/NPOSR-CUW oversight of JBEC safety and health-related activities. Insufficient oversight of JBEC has significantly contributed to the lack of fully developed and implemented safety - and health - related initiatives at NPR-3. The following are some of those deficiencies identified by the SH Site Office Subteam.

- DOE/NPOSR-CUW has not provided clear and timely guidance to JBEC in regards to DOE Orders and requirements. (See Concern OA.1-2.)

- DOE/NPOSR-CUW does not ensure that JBEC and its subcontractors are meeting the training requirements of DOE Orders and 29 CFR regulations. (See Concern TC.1-4.)

- DOE/NPOSR-CUW does not have an Emergency Preparedness Program and has not ensured JBEC has an Emergency Preparedness Program in compliance with DOE Orders. (See Concerns; EP.1-1 and EP.1-2)

- Appraisals of JBEC packaging and transportation activities have not been conducted by DOE/NPOSR-CUW. (See Section PT.11.)

- DOE/NPOSR-CUW has not ensured that aviation charter pilots and aircraft comply with DOE 5480.13. (See Concern PT.13-1.)

- Functional appraisals of JBEC safety and health activities have not been conducted by DOE/NPOSR-CUW. (See Concerns FR.4-2 and FR.5-2.)

- Support, guidance, and direction to JBEC regarding their Occupational Safety and Health Program has not been provided by DOE/NPOSR-CUW. (See Concern OS.1-2.)
- Guidance on resources, organization, and administrative systems for implementing a Fire Protection Program in compliance with DOE Orders has not been provided to JBEC by DOE/NPOSR-CUW. (See Concern FP.1-2.)

- DOE/NPOSR-CUW has not required JBEC to implement the requirements of DOE 5480.8 in regard to its Medical Program. (See Concern MS.1-3.)

- The following concern was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

**CONCERN:** DOE/NPOSR-CUW Site Office has not provided sufficient oversight of the operating contractor safety and health programs and related activities.

**OA.2 ADMINISTRATION**

**PERFORMANCE OBJECTIVE:** Administration programs and controls should be in place to ensure policies concerning health and safety are administered throughout the facility.

**FINDINGS:**
- JBEC Policy and Procedure 1.1-17, "Occurrence Reporting," dated June 1, 1992, describes the methods JBEC uses to comply with DOE 5000.3A. However, this document does not include a specific procedure on how occurrence reports are entered into the Occurrence Reporting and Processing System (ORPS).
- A review of recent occurrence reports revealed that the reporting requirements of DOE 5000.3A are not being met in that many Notification and 10-Day Reports have not been filed within the time specified by DOE 5000.3A, paragraph 7.
- JBEC has not established a formal lessons learned program to utilize information from occurrence reports, other JBEC audits and inspections, and other DOE facilities as required by DOE 5000.3A, paragraph B.c.(2).
- The following concern was partially identified in the JBEC self-assessment (April 1992).

**CONCERN:** The operating contractor occurrence reporting system does not comply with the reporting, procedural, and lessons learned provisions of DOE 5000.3A.

**FINDINGS:**
- DOE/NPOSR-CUW has designated a Facility Representative as part of the NPR-3 occurrence reporting system and has on-line access to the ORPS. However, there are no procedures defining the reporting requirements, sign-off authorities, and data entry into ORPS.
- A review of recent Final Reports indicated they had not been reviewed and signed-off by the Facility Representative within the required 3-working day period as required by DOE 5000.3A, paragraph 8.b.(5).
- The following concern was not identified in the DOE/NPOSR-CUW self-assessment (April 1992).

**CONCERN:** DOE/NPOSR-CUW Site Office does not meet the reporting and procedural provisions of DOE 5000.3A.

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*Note: The text is a continuation of a previous page, indicating a focus on administration and compliance issues.*
OA.3 MANAGEMENT OBJECTIVES

PERFORMANCE OBJECTIVE: Site/facility management objectives should ensure commitment to safe operation, including enforcement of approved work practices and procedures.

FINDINGS:
- The JBEC Safety and Health Manager presents a broad summary of safety activities at the NPR-3 to management at their semi-annual reviews. However, this information does not contain specific management safety and health goals.
- The annual Long Range Plan document discusses the status of ESH activities, but no reference is made to any management safety and health goals.
- Discussions with the JBEC Safety and Health Manager indicated there is no process in place whereby management establishes annual safety and health goals and communicates them throughout the organization as a tool for improving overall safety as required by DOE 5480.19, Chapter I, paragraph C.3.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN:
The operating contractor management has neither developed annual position descriptions nor developed a process to communicate them to the organization as required by DOE 5480.19, Chapter I, paragraph C.3.

OA.6 PERSONNEL PLANNING AND QUALIFICATION

PERFORMANCE OBJECTIVE: Personnel programs should ensure that appropriate job qualification requirements or position descriptions are established for all positions that affect safe and reliable operation.

FINDINGS:
- JBEC position descriptions are prepared in accordance with Policy and Procedure 1.6-01, "Position Description Preparation," dated May 19, 1992. This document instructs the employee preparing his/her position description to list the ESH responsibilities of that position. However, management does not provide the incumbent with specific information on the safety responsibilities applicable to his/her position.
- A review of some older as well as recently revised position descriptions for both management and non-supervisory positions revealed that generalizations were used to describe safety responsibilities. During interviews it was found that some personnel had not seen their most recently revised position description, even though Policy and Procedure 1.6-01 requires the incumbent to participate in the document preparation.
- JBEC Policy and Procedure 1.6-04, "Processing Employee Performance Review," dated April 20, 1992, describes the method for conducting annual employee performance evaluations. This procedure instructs the supervisor to compare the work performed with applicable yardsticks, such as position descriptions. However, position descriptions do not provide the employee with specific and clearly defined safety responsibilities.
- Discussions with the Personnel Manager indicated there are no other formal mechanisms in place where safety performance standards are established for the employee that are used as part of the employee performance appraisal process.
- Although the JBEC Personnel Section is in the process of evaluating a new performance appraisal form (i.e., 1.6-F01 Employee Performance Review-A Total Quality Management Approach, Rev. 3/92), this new approach does not establish specific safety standards for individual's performance in accordance with DOE 5480.19, Chapter I, paragraph B.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN:
Position descriptions do not provide clear documentation of safety responsibilities and clearly defined safety performance standards are not established as part of the operating contractor employee performance appraisal process as required by DOE 5480.19, Chapter I, paragraph B.
**FINDINGS:**

- Discussions with the JBEC Planning and Coordination Supervisor indicated that headcount and Full Time Equivalents (FTEs) are identified within the Long Range Plan. However, that information is not used to develop long range staffing plans for JBEC.

- No formal management plans have been prepared by JBEC, identifying staffing needs or impacts resulting from potential reductions in operating funds, attrition, and the JBEC self-assessment.

- DOE 5480.19, Chapter I, paragraph C.2. stipulates that a long range staffing plan, anticipating personnel losses, should be developed and implemented. Such a plan has not been developed by JBEC.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

**CONCERN:** The operating contractor management has not developed a long range staffing plan as required by DOE 5480.19, Chapter I, paragraph C.2.

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**DOCUMENT CONTROL**

**PERFORMANCE OBJECTIVE:** Document control systems should provide correct, readily accessible information to support site/facility operations.

**FINDINGS:**

- JBEC presently relies on an informal system for its present operating procedures. Policy and Procedures 5.4-08 "Operation Procedure Preparation and Distribution," dated June 1, 1992, and 5.4-09, "Reviewing, Revising, and Deleting Published Operation Procedures," dated June 8, 1992, have been approved to describe the general requirements for the development of OPs. These OPs are being developed as part of a Conduct of Operations initiative that JBEC is presently implementing. However, there is no process in place to determine what OPs must be developed or their order of development.

- Discussions with the JBEC person responsible for OP development indicated the total number of procedures, now estimated to be in excess of 300, has not yet been precisely determined. For example, the Safety and Health Section, due to the Tiger Team visit, has been unable to define the total number of OPs to be developed by that organization.

- JBEC has not developed and communicated to those writing procedures its approach to and the criteria for developing OPs.

- JBEC has not developed an implementation plan along with schedules showing how the development of OPs will be managed and prioritized.

- The following concern was not identified in the JBEC self-assessment (April 1992).

**CONCERN:** The operating contractor has not established a plan for developing and implementing its Operation Procedures.
4.5.2 Quality Verification

4.5.2.1 Overview

The technical area of Quality Verification (QV) was assessed by reviewing draft Quality Assurance (QA) Manuals and related management documents, touring work areas, and conducting interviews with DOE/NPOSUR-CW and JBEC personnel.

Performance Objective QV.1 served as the basis for the QV assessment as neither DOE/NPOSUR-CW nor JBEC has a functioning QA Program in place at NPR-3. For this reason, the other QV performance objectives were not used.

DOE/NPOSUR-CW does not have a QA Program in place as required by DOE 5700.6C. A draft QA Manual has been prepared and submitted to the Office of Fossil Energy for review and approval. The manual is comprehensive in scope, following the 18 elements of Nuclear Quality Assurance Standard One (NQA-1).

However, it is not clear how the QA Program will be implemented in the Site Office and how oversight of the evolving JBEC QA Program will be accomplished by DOE/NPOSUR-CW. The individual presently assigned QA responsibility for the Site Office performs it as a collateral duty chiefly as a member of the Performance Evaluation Board for the Cost Plus Award Fee (CPAF) process. He currently reports to the Director of Engineering, thus, presenting an organizational conflict of interest should he continue to assume responsibility for the Site Office QA Program. In addition, DOE/NPOSUR-CW has not enforced the requirement for implementation of a QA Program by JBEC as required by the DOE operating contract with JBEC.

JBEC does not have a QA Program in place as required by DOE 5700.6C and the QA provisions of its operating contract with DOE. JBEC has prepared a QA Manual based on the DOE/NPOSUR-CW QA Manual that is also under review at the Office of Fossil Energy. JBEC has recently filled the position of Quality Management Coordinator with an individual with Total Quality Management (TQM) and QA/Quality Control (QC) experience who will be responsible for implementing the JBEC QA Program. JBEC management plans to use TQM as the QA implementing tool. However, management has not defined the details for the implementation process. Successful implementation of the JBEC QA Program will be largely dependent on management's ability to apply a graded approach to the site's quality-related activities utilizing existing resources.

The JBEC self-assessment confirms that a QA Program has not been implemented at NPR-3. The proposed corrective actions, however, do not appear realistic in that an overall QA Program is planned to be implemented by September 30, 1992.

The DOE/NPOSUR-CW self-assessment similarly confirms the lack of a QA Program at NPR-3. However, it appears the Site Office does not understand what will be required to implement such a QA Program within its own organization. The responses in the self-assessment were a repetition of the criteria used, stating that the contractor will be required to carry out all the provisions of a QA Program. The self-assessment did not address any corrective actions that must be implemented by the Site Office, except that they will review and audit the contractor plans. This indicates a lack of understanding of the total QA Program requirements as they apply to DOE/NPOSUR-CW.
4.5.2.2 Findings and Concerns

QUALITY PROGRAMS

PERFORMANCE OBJECTIVE: Administrative programs and controls should be in place to ensure policies concerning quality are administered for each facility throughout the site.

FINDINGS:

- JBEC has not implemented a QA Program for NPR-3 as required by DOE 5700.6C, paragraph 9.a.(i).
- Important QA Program elements have not been implemented by JBEC at NPR-3. Examples of elements that need to be considered include:
  - QA requirements and procedures that cover procurement of equipment, materials, and services having safety implications;
  - documented evidence that equipment, materials, and services meet procurement quality requirements;
  - QC inspection program;
  - QC inspector training;
  - procedures that assure identification and traceability of procured items;
  - process control systems and practices;
  - product shipment systems;
  - identification of regulatory matters that may impact operations;
  - calibration of equipment having safety implications performed according to established procedures;
  - procedures and systems to assure the segregation and control of procured equipment and materials to preclude the use of nonconforming items;
  - description of Operation Procedures and their implementation;
  - identification and control of special processes;
  - definition of record retention practices; and
  - an independent audit system to verify compliance with the various aspects of the QA Program.

CONCERN:

The operating contractor has not implemented a quality assurance program at Naval Petroleum Reserve Number 3 in accordance with DOE 5700.6C and the provisions of its operating contract with the Department of Energy.

FINDINGS:

- DOE/NPOS-CW has not implemented an effective QA function or program within the Site Office, as required by DOE 5700.6C, paragraph 10.e. The individual presently assigned QA responsibility for the Site Office handles it as a collateral duty. As such, the individual spends only a minimal amount of his time on QA. His role for QA consists essentially as a Performance Evaluation Committee member for the CPDF process.
- The DOE/NPOS-CW Site Office has not enforced the requirement for implementation of a QA Program by JBEC, as required by DOE 5700.6C, paragraph 10.e.(i) and the QA provisions of the DOE operating contract with JBEC. (See Concern OA.1-3.)
- The Site Office person assigned the Site Office QA responsibility has not received sufficient training in QA to
understand the requirements of an effective QA Program. In addition, this person reports to the Director of Engineering and, thus, would be in an organizational conflict of interest position if permitted to continue in this reporting relationship as the QA Officer.

- Recently, DOE/NPOSR-CUW contracted the services of NUS-Haliburton to prepare a draft QA Manual (draft Naval Petroleum and Oil Shale Reserves Colorado, Utah and Wyoming Quality Assurance Manual, dated April 1992) for the Site Office, based on DOE 5700.6C. This Manual has been transmitted to the Deputy Assistant Secretary, Naval Petroleum and Oil Shale Reserves (letter C. Ray Williams to Captain Meeks, dated June 16, 1992) for review and approval. However, this Manual does not completely address all of the QA criteria set forth in DOE 5700.6C, paragraph 9.b(1)(a) with respect to assessing adequacy of work and management systems. In addition, QA Program implementing procedures have not been developed.

- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not implemented a quality assurance program in accordance with DOE 5700.6C, paragraph 10.e.

4.5.3 Operations

4.5.3.1 Overview

The eight performance objectives in the Operations technical area were addressed in this appraisal. The appraisal was conducted by means of interviews with safety, production, engineering, and management personnel. Policies and procedures, records, and forms were reviewed. All major facilities in the field were visited at least once. DOE Drilling Rigs No. 2 and No. 3, and three workover rigs were appraised. A random selection of steam injection wellsites and test satellite facilities were also visited. Observations were made during an evening shift to evaluate the activities of the night pumper and the water treatment facility operator.

Field operations personnel knew their jobs, showed a keen interest in improving their knowledge, and communicated effectively within the operations group. The oil field facilities did not appear to need housekeeping attention. The LTS Gas Plant, steam generator buildings, and Water Treatment Facility were especially well organized, neat, and clean. However, the two DOE drilling rigs were found to be in poor condition, and the Madison Waterflood supply well, produced water disposal facility, and three Crow Mountain water disposal wells had serious safety deficiencies.

An ineffective interface between JPEC engineering and operations personnel was revealed while assessing the physical arrangement of the steam generators and their associated piping, and the specifications and manufacturer’s drawing for Steam Generator No. 5. Decisions have been contradictory and suggest administrative control problems regarding design and installation.

Many deficiencies were noted on the two DOE drilling rigs. No procedures had been developed or implemented to mothball drilling rigs when not in use. In addition, much of the wire rope and chain rigging on both drilling rigs was substandard, and installation of the climbing device and safety belt on one of the rigs was found to be substandard. Considerable time would be required to correct the deficiencies prior to using the drilling equipment.

Approximately 85 percent of Policy and Procedure documents were republished during the past 6 months. However, the distribution of these documents is limited and does not reach all of the affected personnel. Currently, an effort is being made to publish official Operation Procedures. Of the first group of 18, only 1 sustained the complete internal review process and was published. Therefore, operations personnel do not have guidance afforded by official procedures.

Although most operations were conducted in a safe and reliable manner, some conditions cause concern as to safety awareness. Four such conditions were:

1. Operating 4 reciprocating pumps at the water disposal facility for more than 3 weeks without pressure relief valves protecting the pumps;
2. The ability to discharge liquids from the Steam Generator No. 3 gas scrubber inside the building;
3. A pressure relief valve which could relieve 160° F water at 1,300 psi inside the Steam Generator No. 1 building;
4. The deficiencies noted on DOE Drilling Rigs, No. 2 and No. 3.
Shift turnover between the day pumpers and the lone night pumper effectively provided an accurate picture of the overall site status. A routine which proved adequate, although undocumented had developed without the need for a formal turnover as required by the Conduct of Operations, Order XII. Day pumpers verbally briefed the night pumper who recorded in a stenographic pad the status of those items to which he had been alerted.

The Conduct of Operations training program given this spring during several safety meetings is commendable. Local personnel were assigned chapters to teach, based on those subjects with which they were familiar.

Six of the eight concerns were covered by the JBEC self-assessment. JBEC provided effective corrective action, and deadlines in their assessment. DOE/NPOSR-CUW covered most of the concerns also, but the concerns were actually the responsibility of JBEC. DOE/NPOSR-CUW stated that their corrective action plans would be fully developed after the Tiger Team's visit so that the ES&H findings and concerns could be integrated with these plans. JBEC and DOE/NPOSR-CUW analyzed the findings for causal factors and determined appropriate root causes of deficiencies in the operations area.

4.5.3.2 Findings and Concerns

OP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Operations, organization and administration should ensure effective implementation and control of operations activities.

FINDINGS:

- The JBEC night pumpers, unlike their daylight counterparts, periodically miss some weekly safety meetings due to scheduling of these safety meetings. The night pumpers are consequently not updated with the latest safety information.

- Systematic distribution of Policy and Procedure documents does not occur. Rather, operators are required to be aware of the existence of a procedure which may impact on them, and then ask for a copy from one of the custodians of controlled copies. Consequently, operators fail to be aware of and follow established procedures and practices.

- Seventeen Operation Procedure (OP) documents are being rewritten. Copies of OPs were not found at the work site. Many OPs do not exist, but have been identified as desirable.

- Administrative controls for JBEC Policy and Procedures were found to be confusing; managers provided different answers as to what was available to field personnel and what should be available to field personnel. This illustrates confusion inhouse as to the JBEC management position regarding distribution of Policy and Procedures.

CONCERN: See Concern OP.3-1.

FINDINGS:

- Eight persons reviewed and agreed on the design specifications for Steam Generator No. 5 and its associated piping. However, the Daniel Company design drawing for the purchase was not in full agreement with the approved specifications, but was accepted. The specifications called for a block valve, but a globe valve was shown on the Daniel Company drawing and was installed. No float drain for the gas scrubber was specified, but the Daniel Company had one on their drawing, and it was installed on the scrubber.

- A gauge glass was specified on the Steam Generator No. 5 gas scrubber despite the fact that it does not exist on all other scrubbers. The gauge is of questionable value because of infrequent visits to the generator and because of the scrubber's small size. No high level alarm and automatic fuel gas shutdown are connected to alert operators and to protect the generator.
CONCERN:

(OP.I-I) (H2/C2)

• Connections on the gas scrubber were not specified on the JBEC design specifications. Steam Generator No. 3 has a leak at a 2-inch threaded connection at the top of the scrubber. The fact that some gas lines in the building have threaded connections does not justify having them on the scrubber.

• The float drain valve on the gas scrubber at Steam Generator No. 3 relieves hydrocarbon condensate or water inside the generator building. The float drain has been removed from the inlet gas scrubber for Steam Generator No. 4 by operations personnel. The design specifications did not call for a float drain at Steam Generator No. 5, but such was provided.

• See Concerns TS.3-1, TS.3-2, and MA.5-1.

• The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor operations group does not effectively interface with engineering to ensure sound safety principles in the selection, installation, and operation of components and equipment at Naval Petroleum Reserve Number 3.

(OP.2-1) (H2/C2)

OP.2 CONDUCT OF OPERATIONS

PERFORMANCE OBJECTIVE: Operational activities should be conducted in a manner that achieves safe and reliable operation.

FINDINGS:

• Pressure relief valve piping on fuel gas inlet receiver on Steam Generator No. 1 was labeled incorrectly by JBEC operations personnel.

• Softener train B, primary softener, rinse drain valve AV-B11 L-O Matic valve, leaking hot water (160°F) around the valve body leading to an unsafe operating condition.

• Refractory in the throat of the convection section in Steam Generator No. 3 is loose. Mild steel refractory straps were incorrectly used and have parted. This allowed the refractory material to separate from the steam generator's outer shell, exposing the outer shell to 2,300°F temperatures, resulting in an unsafe operating condition.

• JBEC operations personnel removed pressure relief valves from the 4 water disposal reciprocating pumps thereby removing protection for the system which normally operates at 1,020 psi. Pressure shutdown switch did exist but they do not serve as a device to relieve pressure.

• JBEC operations personnel did not use certified slings to move the mist pump skid and the substructure ramp at DOE Drilling Rig No. 3.

• Suction stabilizers on Pumps No. 3 and 4 at the North Waterflood Plant are operating unsafely in excess of specified working pressures.

• The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor lacks the necessary training, audit, and appraisal programs to ensure safety awareness as required by DOE (H2/C1) 5480.19, Conduct of Operations.

(OP.2-1) (H2/C1)
OP.3 OPERATIONS PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Approved written procedures, procedure policies, and data sheets should provide effective guidance for normal and abnormal operation of each facility on a site.

FINDINGS:
- There are no OPs at the LTS Gas Plant. An industry book for operating various types of gas plant equipment is available.
- No OPs or checklists are in final form for the water treating facility or for the well service units.
- Procedures are not readily available and clearly identified on each steam generator control panel for starting up and for shutting down the steam generator.
- No Policy and Procedures have been developed or implemented to mothball DOE drilling equipment.
- Operators do not have Policy and Procedures which apply to their job and assigned facility.
- Many OPs in the master file are listed as "Identified - Not Drafted" which means they do not really exist.
- LTS Gas Plant personnel were not fully aware of a revision to JBEC Policy and Procedures 1.3-27, "Lock, Tag and Try" procedure, dated June 8, 1992, 19 days after it had received DOE/NPOSR-CUW approval.
- See Concerns OA.7-1 and MA.2-2.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor operators do not have approved Operation Procedures to aid them in performing their duties as required by DOE 5480.19, Conduct of Operations.

FINDINGS:
- JBEC Policy and Procedures 1.3-27 requires a record of all Caution tags. Danger tags used for equipment isolation for personnel protection do not require a record of where they have been installed. This does not agree with DOE 5480.19, Conduct of Operations, Chapter IX, which requires records of the placement of Danger tags and Caution tags.
- The following deficiencies in lockout/tagout recordkeeping were identified:
  - Water treatment facility and the North Waterflood Plant have no log of lockout/tagout locks, and these locks are not numbered.

- Pumps do not keep a log of locked out/tagged out locks.
- The LTS Gas Plant is not keeping a log of locked out/tagged out locks.
- JBEC Policy and Procedure 1.3-27, is deficient with respect to recordkeeping requirements.
- Electrician's locks are not always placed on LTS Gas Plant switchgear.
- JBEC Policy and Procedure 1.3-27 does not discuss the use of hasps to hold several locks as defined in DOE 5480.19, Conduct of Operations.
- JBEC Policy and Procedure 1.3-27 mentions group lockouts only once and does not define them as to what group it applies to, or the circumstances under which they are used.
- See Concern WS.4-6 and Section 05.2.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor Policy and Procedure 1.3-27, Lock, Tag, and Try Procedure is incomplete and, consequently, not effective in ensuring safety of operations as required by DOE 5480.19.

FINDINGS:
- The contract between DOE/NPOSR-CUW and JBEC states that the Bureau of Land Management (BLM) Onshore Oil and Gas Orders and the State of Wyoming Oil and Gas Rules and Regulations must be followed with respect to oil and gas producing operations at NPR-3.
- DOE/NPOSR-CUW workover procedures specify that blowout preventers are to be used on Shannon oil wells capable of flowing during workover operations.
- Blowout preventers are not employed uniformly on Shannon oil wells, which have the capability of flowing during workover operations, as required by the State of Wyoming and the BLM.
- JBEC does not have formal correspondence from the State of Wyoming or the BLM waiving the use of blowout preventers on well capable of flowing during workover operations.
- The following concern was not identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor field operations do not meet the intent of both the State of Wyoming and Federal Bureau of Land Management regulations regarding the use of blowout preventers on wells capable of flowing during well workover operations.

OP.4 FACILITY STATUS CONTROLS
PERFORMANCE OBJECTIVE: Operations personnel should know the status of the systems and equipment under their control and should know the effect of non-operational systems and equipment on continued operations. They should ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

Defective or out of tolerance instrumentation is identified, properly labeled, and corrective measures are to be taken in a timely manner.

FINDINGS:  
- A bypass valve at Steam Generator No. 3 which was tagged "valve to remain in open position" was in fact in the closed position. No procedure was employed to release the tagout as required by DOE 5480.19.
- Orifice meters at the individual steam injection wells are not calibrated or checked for accuracy on a regularly scheduled basis. Most steam injection meters have not been calibrated since they were installed.
- The old filter room had two locks from electricians on 480 volt boxes, but there was no "Do Not Operate" tag, and the boxes were not counter locked by the operator.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor operations personnel do not effectively monitor the operating condition of equipment as required by DOE 5480.19.

OP.5 OPERATIONS STATIONS AND EQUIPMENT
PERFORMANCE OBJECTIVE: Operation stations and facility equipment should effectively support facility operations.

FINDINGS:  
- The two DOE drilling rigs, mud mixing skid, waterflood facilities, steam injection wells, and produced water disposal facilities were found to have serious safety deficiencies.
- The steam pressure gauge on steam injection Well 73-3SX-10, and the temperature gauges on steam injection Wells 64-2SX-10 and 67-62SX-3 are broken.
- Wire armor on the 10-inch suction hose on the mud mixing skid from DOE Drilling Rig No. 3 has separated from the rubber jacket, compromising safety. This self-contained mud mixing skid is used to mix kill mud for Shannon oil well workovers.
- Short bolting is evident and bolts are missing at Crow Mountain water disposal Wells 34-CMX-10, 01-CMX-10, and 74-CMX-10, and at the North Waterflood Plant.
- Madison water supply Well 17-WX-21 is capable of naturally flowing 20,000 BWPD of 185°F water. The 8-inch discharge line from the well has a bolt missing from an elevated companion flange, compromising safety.
- A temporary discharge-to-suction bypass at the North Waterflood Plant is constructed of unrated and unlabeled hose. The safe working pressure of the hose is unknown.
- Oil is not visible in the lubricator bulb at the T-1-3 test satellite pump, and the ground cable is not attached to the pump base at test satellite T-1-34.
- Much of the wire rope and chain rigging on DOE Drilling Rigs No. 2 and No. 3 was found to be substandard and is not in agreement with the DOE Hoisting and Rigging Manual.
- The cable attached to the climbing device on DOE Drilling Rig No. 3 is badly frayed and improperly clamped.
- On DOE Drilling Rig No. 2, the climbing device and safety belt for the derrickman have less than adequate lanyards. The belt has no locking clips to attach the belt to the lanyard. A sheave on the traveling counterweight on the derrickman's escape line has seized; the cable support bracket for the counterweight contains only two U clamps(3 required); and the crown sheave pin supporting the climbing device counterweight is severely bent compromising safety and reliable operation.
- See Concerns WS.5-2 and MA.2-2.
CONCERN: Certain operating contractor facilities and drilling equipment are not operated in a safe and reliable manner as required by DOE 5480.19.

FINDINGS:
- Formal training in operations is not conducted.
- The period of apprenticeship varies widely.
  - A new employee with oilfield experience was accompanied on the job for 1 week before working unsupervised.
  - Another new employee was accompanied for 4 weeks before working unsupervised at night.
- Employees are not formally tested as to their knowledge and capabilities.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor operators do not complete formal qualifications before operating alone as required by DOE 5480.19.
4.5.4 Maintenance

4.5.4.1 Overview

All eight performance objectives in the Maintenance technical area were addressed in this appraisal. The appraisal was conducted through interviews with operations personnel that perform maintenance work, onsite surveys of site maintenance activities, and a review of DOE Orders. Facilities surveyed included workover and drilling rigs, water disposal facilities, steam injection facilities, water flood facilities, the LTS Gas Plant, production tank battery and test-satellite facilities, and production wells.

The maintenance organization is well defined and understood. The maintenance, field support, LTS Gas Plant, and Water Facilities groups perform all levels of maintenance work whereas production, workover, and drilling groups primarily conduct preventive and minor maintenance work on surface equipment. However, except for new construction, field maintenance does not provide routine onsite coordination to, or receive daily input from, engineering and safety.

The JBEC graded approach to implementation of maintenance activities does not include formal documentation of a comparative analysis of maintenance activities at NPR-3 with DOE 4330.4A. Engineering and safety support at the work activity level have not been sufficient to alleviate the untimely identification and correction of deficiencies by maintenance. These deficiencies include non-code installations, improper operation of equipment, equipment deterioration, and unsafe practices, and have led to three Category II Concerns. Once identified during this appraisal, these concerns have been either physically corrected or mitigating administrative procedures are being implemented.

The NPR-3 facility had a high level of operational readiness and a neat, orderly appearance. Preventive Maintenance and corrective maintenance are minimized through widespread use of buildings and shelters; these provide environmental protection of components and equipment.

Observations of work activities showed that maintenance personnel were qualified, except in the areas of industry codes and standards. Safe work practices were generally being used during observed JBEC work activities; however, numerous latent safety hazards were noted in the work areas. These were due to a lack of safety awareness. Lax enforcement of safety procedures was observed during a wireline subcontractor work activity.

The operating and maintenance groups perform maintenance design work for most small projects. Engineering and safety expertise has not been utilized to ensure compliance with applicable laws, regulations, industry codes, and standards, except during new construction. Typical drawings of routine type field installations and repairs, that show acceptable connections, fittings, valves, and welding requirements, were not provided by engineering to the field.

Except for safe work permitting procedures, there were virtually no JBEC written procedures in use by maintenance personnel. Experience, manufacturer’s data books, and checklists were the source of maintenance work procedures. JBEC written work procedures were in the draft stage of development.

Recordkeeping differs somewhat between the groups, because each operating group has maintenance responsibilities with varying degrees of mobility and scope. Standardized central monitoring and storage of records does not occur. In some areas, such as safety and work completion control, the records are not sufficient to support implementation of a graded maintenance program to meet the intent of DOE 4330.4A.

No Predictive Maintenance Program has been implemented. A history of maintenance was maintained on most equipment through the use of permanent log books. No other data were collected which would support a Predictive Maintenance Program. There were no indications that any individual piece of equipment was sufficiently critical to facility performance to require a Predictive Maintenance Program.

The JBEC self-assessment was comprehensive and critical. Four maintenance concerns were partially recognized and five were fully recognized out of the nine maintenance concerns identified in this report.
MA.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

FINDINGS:
- Although the maintenance organization was well defined and understood, it did not ensure qualified engineering and safety input was provided.
- First-line supervisors used substitute parts and materials without engineering approval.
- Maintenance work was generally not coordinated with engineering which resulted in non-code installations.
- The first-line supervisor was not provided technical guidance, training, or procedures for proper authorization and passing of safety devices for operating and maintenance activities.
- See Concern TS.3-1 and OS.1-1.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor maintenance organization does not ensure effective implementation and control of maintenance activities and does not ensure that safety and engineering support are provided for work activities.

FINDINGS:
- Procurement of electrical parts did not keep up with job needs. Some electrical parts for maintaining hazardous area classifications have been on order for a year. Management has not taken action to rectify this situation. This resulted in continued operation with an existing potential ignition source in a Class I, Group D, Division I hazardous area. Examples are:
  - The LTS Gas Plant main compressor building.
  - The LTS Gas Plant RAMCO Compressor building.
  - The B-110 tank battery test manifold building.
- See Concern WS.4-5.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor has permitted hazardous conditions to exist during continued operations, because of a backlog of electrical parts, which is not in accordance with DOE 4330.4A, CAT. II paragraph 3.4.8.

MA.2 CONDUCT OF MAINTENANCE

PERFORMANCE OBJECTIVES: Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

FINDINGS:
- A Maintenance Management Plan has not been developed that formally documents the existing graded maintenance program, including a comparative analysis of the maintenance activities at NPR-3 with DOE 4330.4A. (See Concern OA.1-2.)
- Instructions and specialty job training were informal, on-the-job, and not documented.
- Except for safe work permitting procedures, there were virtually no written work procedures used by maintenance.
- Authorization and control of maintenance work procedures did not provide sufficient documentation in the areas of safety and work completion.
- The work order tracking system form used by the production group was not completely filled out prior to destruction of a completed work order. There was a very limited record of maintenance done.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor Maintenance Program does not meet the systematic documentation requirements of DOE 4330.4A, paragraphs 3.3 and 3.4.

FINDINGS:
- There was no uniform implementation of industry standards and codes applicable to electrical, piping, and pressure vessel maintenance.
- The maintenance group has routinely fabricated non-standard pipe fittings to permit completion of work on schedule. For example, a field fabricated non-code pipe fitting type weld cap, cut from flat plate, was used to close the end of a pressurized production flow line pipe which could result in an early piping failure at Well No. 16-S-35.
- Maintenance and operating groups design small projects without engineering input. This has resulted in some non-code installations such as the wooden vent/sump boxes at battery locations.
- Facility Engineering did not attend operations morning meetings where daily and future maintenance work was discussed and resolved.
- Typical engineering drawings for repetitive type installations were available in the Casper office but not in the field.
CONCERN: See Concern MA.1-1.

FINDINGS:

- Entry through the main gate to the LTS Gas Plant was not controlled to minimize exposure when passing through Class 1, Group D, Division 1 and 2 hazardous areas.

- The gate to the fenced 480/2,080 volt electrical equipment at Well No. 55-TP-10 was not locked to prevent unauthorized personnel from entering.

- Except for piping drawings, the LTS Gas Plant drawings were not updated for changes.

- Workover rig operations were not always conducted with the rig personnel properly instructed and equipment correctly set-up.
  - Rig P-6, while located at Well No. 41-11-SX-11, had 2 snug guy wires and two loose ones.
  - Numerous downhole well maintenance operations were conducted without written procedures onsite.
  - Gas engine vehicles were not controlled with respect to the distance from a well bore.
  - Wireline subcontractor personnel were not briefed on important site safety requirements, such as posting of proper signs at entrances to a well site while arming/disarming explosives.

- The following concern was fully identified in the JBEF self-assessment (April 1992).

CONCERN: Use of outdated drawings, lack of written procedures, and lax enforcement of informal procedures by the operating contractor has resulted in unsafe practices in the field and does not meet the requirements of DOE 4330.4A.
MA.3 MAINTENANCE FACILITIES, EQUIPMENT, AND MATERIAL

PERFORMANCE OBJECTIVE: Facilities, equipment, and material should effectively support the performance of maintenance activities.

FINDINGS:

- A 110-barrel capacity fiberglass maintenance solvent tank located at the maintenance group's Chemical Dock did not have an internal ground wire system for conducting electrical charges to ground.
- An outside-type fuel gas regulator, which vents locally, was located inside the Welding Shop Building.
- The Welding Shop fuel gas regulator had a maximum pressure rating of 150 psig, which is well below the maximum possible source pressure of 375 psig.
- A field fabricated 1,440 psig working pressure pig launcher was found in the welding shop. One end was fabricated out of non-code pipe fittings, which could result in failure at that pressure.
- The LTS Gas Plant had several field fabricated electrical adapters that were used for maintenance to connect unclassified electrical equipment to classified electrical outlets in hazardous areas. This practice could ignite flammable atmospheres.

CONCERN: See Concern MA.5-1.

FINDINGS:

- Operating instructions were not posted on the following maintenance facility equipment:
  - DOE Unit No. 3 Forklift, which also had no capacity tag;
  - DOE Unit No. 69 Case Backhoe;
  - DOE paint trailer; and
  - DOE Hot Water Pressure Washer.
- None of the pressure hoses used by maintenance for handling chemicals had been pressure tested since purchase.

CONCERN: See Concern MA.2-2.

FINDINGS:

- No electrical flash protection suits, aprons, or face shields were provided for electricians.
- One pair of insulated gloves was onsite for the use of six electricians.
- See Concern OS.3-1.

CONCERN: The following concern was partially identified in the JBEC self-assessment (April 1992).

(MA.3-1) (HI/C1) The operating contractor has not provided personal protective equipment for all maintenance activities as required by DOE 4330.4A.
MA.4 PLANNING, SCHEDULING, AND WORK CONTROL

PERFORMANCE OBJECTIVE: The planning, scheduling, and control of work should ensure that identified maintenance actions are properly completed in a safe, timely, and effective manner.

FINDINGS:

- Pumping jack polish rod liner damage and excessive bearing wear were noted on Well No. 67-42-SX-3. This resulted from lack of early identification of maintenance deficiencies, such as worn components and/or alignment problems.

- Fifteen to 20 percent of all pumping jacks needed repair or alignment.

- Some equipment has been left improperly installed. Well No. 57-WX-3 had a new production tee with a significant water leak.

- Procedures for post maintenance testing and operator acceptance of completed maintenance work were not developed.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor personnel have not been instructed on proper inspection and post-maintenance control procedures as required by DOE 4330.4A, Section 3.

MA.5 CORRECTIVE MAINTENANCE

PERFORMANCE OBJECTIVE: The material condition of components and equipment should be maintained to support safe and effective operation of all facilities on the site.

FINDINGS:

- Relief valves had been removed from the discharge of three large tri-plex positive displacement pumps since June 3, 1992. The pumps were in service and were only protected by high pressure shut down operating switches.

- The Steam Generator No. 1 fuel gas scrubber had an apparent under designed relief valve system. The scrubber was rated for 200 psig and the closest upstream relief valve was set at 1,200 psig.

- Flame arresters on bulk treaters at Battery No. 1-3 were not effective, because they were dirty and/or structurally damaged.

- A below ground level, vent/bottom, sludge, and water (BS&W) concrete box with wood cover was located at each tank battery. These boxes were improperly vented for receiving pressure vessel over pressure relief gas and were not provided with a safe means to remove liquids with a vacuum truck.

- The Production Lease Automatic Custody Transfer (LACT) Building and the AMOCO building at the South Terminal did not meet area electrical requirements because they were located within a more hazardous area.

- A large number of tanks, skids, buildings, and electrical gear were either not grounded, did not have a separate ground, or did not have a properly sized ground.

- Heater treater pilot lights did not automatically shut off fuel when the flame went out. The gas came back on through the main burner when it was called for by the thermostat.

- A 1-inch valve to the heater treater was not locked open to prevent over pressure of the 150 psig rated fuel gas scrubber (there was no separate relief valve) at Tank Battery No. 1-3. Maximum source pressure was 375 psig at the LTS Gas Plant.

- Several lease production buildings, such as buildings attached to heater treaters, were not properly vented resulting in a potentially explosive atmosphere.

- Several other lease production buildings, such as the South Terminal Production LACT building, did not meet hazardous area electrical requirements.
**CONCERN:**

- The 125 psig fuel gas scrubber located at B-110 tank battery had no relief valve and could be blocked in and subjected to a source pressure of 375 psig.
- The hot produced water tank (180 - 200 degrees Fahrenheit) at the Ten Sleep tank battery had a serious leak at the bottom because of deterioration from corrosion.
- Several code vessels (i.e., vertical heater treater at T-3-28) were continued in operation after field repairs were made without following vessel repair code procedure.
- A field fabricated non-code pressure vessel, without upstream pressure relief protection, was used to inject ethyl mercaptan into the LTS Gas Plant liquid products.
- The hot, produced water tank, at the North Waterflood facility, had heavy corrosion and was leaking at a previous repair located inside the filter building. The tank has a potential for a severe failure unless promptly repaired or drained.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

**CONCERN:** The operating contractor engineering and safety assistance provided to the maintenance organization in the field has not been sufficient, and the maintenance organization has not maintained the material condition of components and equipment in a manner to prevent hazardous conditions caused by non-code installations, improper operation of equipment, and equipment deterioration to meet the requirements of DOE 4330.4A.

**FINDINGS:**

- A few small hydraulic and engine oil leaks were noted on workover rigs.
- Workover rigs were operating without a written prognosis (procedure) on the rig for the work.
- Numerous, open ended, quarter-turn valves were noted on hydrogen sulfide contaminated gas streams on producing wells.
- Numerous wells were noted where the pumping jack skid was loose on the pad and/or out of alignment with the well bore.
- The South Terminal sump pump had a loose conduit connection at the motor.
- Small pump packing and piping connection leaks were noted at several locations.
- Area electrical classification requirements were not met in some locations because seals were not installed.
- LTS Gas Plant Control Monitoring Building had an unclassified electrical outlet in the lab room.
- The bypass valve on inlet Emergency Shutdown (ESD) valve to the LTS Gas Plant was closed, but not sealed.
- DOE Drilling Rigs No. 2 and No. 3 require significant maintenance prior to use.

**CONCERN:** See Concerns MA.2-2, W5.5-2, and OP.5-1.
MA.6  PREVENTIVE MAINTENANCE

PERFORMANCE OBJECTIVE: Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

FINDINGS:

- Stored facility maintenance equipment and equipment on standby were not on a preventive maintenance (PM) listing.
- The computerized PM program did not include all field operating equipment and duplicated separate PM programs maintained by most of the various groups that performed their own preventive maintenance.
- The preventive maintenance backlog was minimal, except for PM of pumping jacks which was about 2 months behind schedule because of the PM computer program shutdown for revision.
- PM procedure for pumping jacks did not require a check of alignment with the well.
- DOE Drilling Rigs No.2 and No.3 were stacked without PM and CM being performed.
- PM was not performed on out-of-service equipment. For example, the 16-inch manway on out of service heater treater at Test Satellite No. BI-14 was open, and the vessel was unprotected from the environment or unauthorized entry.
- Vibration switches on the cooling fans at the LTS Gas Plant were not tested as part of the PM program.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN:

The operating contractor Preventive Maintenance Program does not always meet the intent of DOE 4330.4A, paragraph 3.6.1.

MA.8  PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Maintenance procedures and related documents should provide appropriate directions and guidance for work and should be used to ensure that maintenance is performed safely and effectively.

FINDINGS:

- There was no central or otherwise suitable place to store maintenance records for most of the groups that perform maintenance.
- There were virtually no existing written maintenance procedures in use, except on safe work permitting.
- Maintenance records are not kept on some equipment. For example, there are none for pumping jacks.
- See Concern MA.2-2.
- The following was fully identified in the JBEC self-assessment (April 1992).

CONCERN:

The operating contractor does not provide sufficient documentation and records storage in support of the Maintenance Program as required by DOE 4330.4A, Section 3.
Five of the 11 performance objectives in the Training and Certification technical area were addressed in this appraisal. The following performance objectives, not applicable to NPOSR-CUW, were not addressed: TC.2 Reactor Operations, TC.3 Nuclear Facility Operations, TC.6 Criticality Safety, TC.9 Radiological Protection Personnel, TC.11 Simulator Training/Facility Exercises. TC.8 Quality Control Inspection, also not addressed, was covered in Section 4.5.2 Quality Verification. Interviews were held with Managers in Safety and Health and Personnel, the Training Specialist, Facility Supervisors, and the DOE/NPOSR-CUW Director of Contract Surveillance and Administration. Documentation was reviewed and evaluated for adequacy of policies, procedures, training materials, and training records. The effectiveness of training in operations, maintenance, and occupational safety was evaluated by members of the Safety and Health (S&H) Subteam during visits to the Site. Self-Assessments for NPOSR-CUW, prepared by both J B E C and DOE/NPOSR-CUW, were also reviewed and evaluated.

Safety and health training for NPR-3 operations has probably been as good or better than most oil field activities, but has not met DOE standards. As a result, JB E C is in a reactive and catch up training effort, caused to a great extent by lack of direction from DOE/NPOSR-CUW. JB E C training has been informal with little attention paid to controlling the quality of planning and scheduling, training materials, instructor credentials, qualification requirements, and recordkeeping. JB E C does not have a formal training program to ensure that operations, maintenance, and technical staff have safety, health, and qualification training required by DOE Orders. Nevertheless, JB E C recognizes these deficiencies and has been making efforts to improve all aspects of training. In addition, a number of specific training activities have occurred in the past 6 months. During February and March of 1992, each shift of the production unit conducted Operations Order Technical Representatives (TORs) training and Los Alamos National Laboratory (LANL) training. In addition, the following safety training has been provided: annual ESS&H refresher training, OSHA safety review, 40-hour HAZMAT training, hydration breathtaking (HBJ) monitoring, respiratory training, confined space entry (CSE) training, and emergency preparedness and management.

Education and training for JB E C is administered by the Personnel Section, which is responsible for facilitating offsite education and training and maintaining computer-based training records, and the Safety and Health Section, which is responsible for providing ESS&H and technical skills training, including administration of qualification and certification requirements. The budget available for offsite education and training for JB E C personnel was found to be far too small to provide a meaningful program. For offsite training, recorded learning hours were maintained only as training session attendance sheets. Therefore, first-line supervisors have not complete training records to ensure that their staff members have received the necessary ESS&H and qualification training required by DOE Orders. JB E C recognizes this deficiency and is working to get all training records into the computer database.

The Training Specialist, reporting to the Safety and Training Manager, is responsible for the onsite ESS&H and technical skills training program. He has a relevant background and experience for this responsibility and the knowledge of what activities need to be conducted (i.e. needs analysis based on specific jobs and tasks, a comprehensive training plan, updated training materials, instructor training, and evaluation of training effectiveness). Operations and maintenance worker training has occurred as on-the-job instruction, but qualification requirements have not been well documented. Training for first-line supervisors and managers has not been provided to prepare individuals for personnel and administrative responsibilities. A training room in the Safety Bldg. is equipped to meet the needs of onsite safety training. Safety meeting training is given either in the training room or in available conference rooms and lunch rooms.

Within the past year, much more attention has been given to general employee and occupational safety training. Site-specific safety orientation training is given to new employees, visitors, and subcontractors. The outline of the annual orientation, given to essentially all employees in 1991 and 1992, is comprehensive. Nevertheless, JB E C does not provide appropriate ESS&H training to all employees according to their job needs. Deficiencies in performance of activities were noted by the S&H Subteam in areas such as confined space entry, hazard communication, competent persons, and spill prevention and control. There is no formal training for environmental monitoring and sampling, and certification of ESS&H training has not been consistent.

Safety training topics presented by first-line supervisors at weekly safety meetings have been an important part of ESS&H training, but its effectiveness can be improved by greater coordination and documentation of content by the Training Specialist. Subcontractors coming on to the site pose a particular problem in that many have not had the necessary ESS&H training. Requirements for ESS&H training have generally been included in subcontracts, but JB E C has not been effective in monitoring and enforcement. New procedures require that subcontractors must present safety training documentation at the Contractor's Training Office (CTO). The Simulators are equipped to meet the needs of onsite safety training. Safety meeting training has occurred as on-the-job instruction, but qualification requirements have not been well documented. Training for first-line supervisors and managers has not been provided to prepare individuals for personnel and administrative responsibilities. A training room in the Safety Bldg. is equipped to meet the needs of onsite safety training. Safety meeting training is given either in the training room or in available conference rooms and lunch rooms.

Both the JB E C and DOE/NPOSR-CUW self-assessments were comprehensive, critical appraisals of training and certification activities at NPOSR-CUW. All of the concerns expressed in this appraisal, as well as many other critical findings, were identified in both self-assessments. Casual and oversight actions (Technical Representatives (CTRs)) responsible for monitoring subcontractor performance, require additional training in hazard recognition and OSHA requirements. DOE/NPOSR-CUW does not conduct surveillance and oversight of either JB E C training programs or subcontractor training compliance. This has been expressed as a concern.

Both the JB E C and DOE/NPOSR-CUW self-assessments were comprehensive, critical appraisals of training and certification activities at NPOSR-CUW. All of the concerns expressed in this appraisal, as well as many other critical findings, were identified in both self-assessments. Casual and oversight actions (Technical Representatives (CTRS)) responsible for monitoring subcontractor performance, require additional training in hazard recognition and OSHA requirements. DOE/NPOSR-CUW does not conduct surveillance and oversight of either JB E C training programs or subcontractor training compliance. This has been expressed as a concern.
4.5.5.2 Findings and Concerns

TC.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: The training organization and administration should ensure effective implementation and control of training activities.

FINDINGS:

- JBEC Policy and Procedure 1.6-08, "Employee Training Courses," dated June 1, 1992, states the JBEC policy is to provide continuing training for all employees. Each department manager is responsible for presenting an annual training plan. The Personnel Section is responsible for budgets and schedules of offsite training sessions. For the past few years the budget to support offsite training activities for JBEC employees has been $10,000 or less.

- JBEC Policy and Procedure 1.3-35, "In-House Training," dated June 9, 1992, states the JBEC policy is to provide in-house training on safety, environmental, and work related issues and procedures. Supervisors are responsible for ensuring that their employees attend scheduled training meetings and for requesting special training as needed. The first-line supervisors do not have the specific responsibility to ensure that personnel under them have the safety and health training required by DOE Orders and by 29 CFR 1910 and 1926 regulations.

- JBEC Policies and Procedures do not require a periodic assessment of the effectiveness of the training program.

- The Training Specialist, who reports to the Safety and Health Manager, is responsible for developing an in-house training plan. The plan has not yet been developed. He is also responsible for conducting a training needs analysis based on job and task requirements, and this has not yet been done.

- Formal on-the-job training has not been developed for field operations and maintenance personnel as required by DOE 5480.19 and DOE 4330.4A.

- LTS Gas Plant and the Water Treatment Facility have no formal training program for operations.

- No JBEC field drilling and workover personnel have current Minerals Management Service certification in well control operations.

- JBEC internal appraisals do not regularly review the overall operation of each facility to ensure that operator and supervisor qualification and certification programs meet DOE requirements.

- See Concerns PT.2-1, EP.3-1, and EP.3-2.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: (TC.1-1) (H2/C1)

The operating contractor has not implemented a formal training program to ensure that operations, maintenance, and technical staff have required safety and health training and qualification training in accordance with DOE 5480.19, DOE 4330.4A, and DOE 5480.3.

FINDINGS:

- Training records for in-house courses have generally been kept on course attendance sheets. In that form, individual training based on ES&H and work qualification requirements for assigned job tasks is not readily verifiable.

- The Personnel Section has the responsibility to maintain training records in a computer database. Offsite training records for all employees have been regularly put into this database, but all onsite training records have not been incorporated.

- In general, individual training files do not contain written and oral examination results or on-the-job demonstration requirements and checklists.

- First-line supervisors do not keep training records on hand to ensure that persons working under them have safety and health training and qualification training required by DOE Orders and 29 CFR regulations.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: (TC.1-2) (H2/C2)

The operating contractor training records are not maintained to enable verification of safety and health training requirements and job qualification requirements.

FINDINGS:

- JBEC Policy and Procedure 1.3-32, "Subcontractor Safety Monitoring," dated May 22, 1992, states that subcontractors performing work at NPSR-CUW are required to comply with all DOE Order requirements and safety and health regulations. However, not all subcontractors have had the necessary training to meet these requirements.

- JBEC plans to include appropriate S&H requirements in all future contracts, such that subcontractors must provide proof of safety documentation including training records. This Policy and Procedure has not been fully implemented.

- On a limited basis, JBEC has provided some S&H training for subcontractors who do not meet the training requirements, rather than delay the necessary work by requiring the subcontractor obtain the training from other sources.

- The S&H Subteam members noted exams of subcontractors lacking training in occupational safety requirements including:
  - At injection well No. 72-S-SX 3, Dyna Jet, Inc. personnel said they had not received a safety briefing by JBEC.
CONCERN: (TC.1-3) (Hi/Cl) Electrical maintenance workers who service the substation at the LTS Gas Plant had not received training in electrical safe work practices as required by 29 CFR 1910.331-335.

- On the road leading to the pond, the backhoe operator, who was cleaning up an oil spill, had not had hazardous material training.

- COTRs have recently been given the responsibility for monitoring the safety training provisions of the subcontract, but that effort has not yet been implemented. Most COTRs have not received training to serve as a technical representative and are not skilled in hazard recognition or OSHA standards.

- See Concerns WS.4-5, WS.4-9, WS.5-1, WS.5-2, OS.4-2, TC.1-3, and FP.2-1.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not ensure that all subcontractors working onsite satisfy safety and health training and job qualification requirements specified in 29 CFR 1910 and 1926 regulations.

FINDINGS: 

- DOE/NPOSR-CUW does not conduct regular surveillance and oversight of JBEC training programs as required by DOE 5482.1B.

- DOE/NPOSR-CUW does not monitor to ensure that subcontractors are meeting the health and safety training requirements for the NPOSR-CUW sites.

- See Concerns WS.5-1 and WS.5-2.

- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office does not ensure that the operating contractor and its subcontractors are meeting the training requirements of DOE Orders and 29 CFR regulations.

FINDINGS: 

- During April 1991 and April 1992, annual refresher training on general employee safety was given to all employees, and site-specific occupational safety training was provided to all field employees. Each training session was 3 to 4 hours in length. In some cases, Casper office personnel did not have the site-specific safety training before going to the field.

- Weekly safety meetings in operations and maintenance are used to augment the annual refresher training for the presentation of site-specific occupational safety training topics. Generally, these training sessions have not been coordinated with the Training Specialist and are not always well documented.

- Components of safety training provided in either the weekly safety meeting or annual refresher training did not meet the specific training requirements of 29 CFR regulations (e.g., confined space entry, hazard communications, electrical safety), because either the content was not well defined, the extent of the coverage was brief, the instructor was not approved, or examinations were not given and documented.

- Although all field employees were said to have had 20 minutes of training on the use of H2S monitors, S&H Subteam members observed that the monitors were not used appropriately as employees entered hazardous areas.

- Competent person training has not been provided to workers conducting or supervising activities with mandatory OSHA training requirements. Examples observed by S&H Subteam members include:
  - At Well No. 16-5-35, the Supervisor, who had oversight had not been trained as a competent person for inspection of excavation activities.
  - At DOE Drilling Rig No. 2, no one had been trained as a competent person for oversight of machinery activities.

- See Concerns FP.2-1, EP.3-1, EP.3-2, WS.4-5, WS.4-6, WS.4-8, WS.4-9, WS.5-1, WS.5-2, WS.6-1, and Section OS.5.

- The following concern was fully identified in the JBEC self-assessment. (April 1992)
CONCERN: Not all operating contractor employees at the Naval Petroleum Reserve Number 3 receive occupational safety and health training appropriate to their needs as specified in 29 CFR 1910 and 1926.

TC.5 MAINTENANCE PERSONNEL

PERFORMANCE OBJECTIVE: The maintenance personnel training qualification programs should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS: • A formal training and qualification program for maintenance personnel at NPR-3 has not been developed and implemented as required by DOE 4330.4A.

• Maintenance worker qualification training is generally on-the-job training which has not been documented.

• Safety meetings are used to provide occupational safety training. Training record sheets, which are designed to provide a record of attendance by the individual training topic, are not well documented.

• Training records do not provide evidence that maintenance workers have the safety and health and technical skills training for their assigned tasks.

CONCERN: See Concern TC.1-1.
**TC.10  TRAINING FOR SUPERVISORS, MANAGERS, AND TECHNICAL STAFF**

**PERFORMANCE OBJECTIVE:** Training programs for supervisors, managers, and the technical staff should broaden overall knowledge of processes and equipment and develop supervisory and management skills.

**FINDINGS:**
- First-line supervisors do not receive formal supervisory and management training in accordance with DOE 5480.19.
- Training for supervisors and managers has not been generally provided to prepare individuals for personnel and administrative responsibilities.
- In September 1990, topics from the National Safety Council supervisory training were presented to first-line supervisors.
- A 24-hour course entitled "The Foundation of Good Supervision" was given in 1985.
- See Concerns WS.4-6, WS.4-9, WS.5-1, WS.5-2, OA.8-1, and Section EP.1.
- The following concern was fully identified in the JBEC self-assessment. (April 1992)

**CONCERN:** The operating contractor does not generally provide training for first-line supervisors and managers to prepare individuals for assigned responsibilities in accordance with DOE 5480.19.

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**4.5.6  Emergency Preparedness**

**4.5.6.1  Overview**

The Emergency Preparedness appraisal addressed all seven performance objectives in the Emergency Preparedness technical area for NPOSR-CUW. In addition, two other areas were addressed: the Emergency Public Information Program and Hazardous Materials Response Program. The appraisal was accomplished through interviews, document reviews, equipment assessments, and an emergency drill. Interviews with managers, supervisors, specialists, JBEC Emergency Management personnel, senior JBEC and DOE/NPOSR-CUW management, and various members of the emergency response organization were used to ascertain how emergency response activities and the Emergency Preparedness Programs were conducted, managed, and controlled. Documents reviewed and examined included records, the emergency plan, procedures, training program records, training programs, and supporting documents. These were compared for compliance with DOE 5000.3A, the DOE 5500-series of Orders, the DOE 5480-series of Orders, American National Standards Institute (ANSI) Standards, and good industry practices.

The JBEC Emergency Preparedness Program is in the early stages of development and has limited capability to respond to natural and man-made emergencies and to provide guidance and protection to onsite employees and offsite population. DOE/NPOSR-CUW has not developed an emergency management plan and has not provided emergency preparedness or personal protection training.

JBEC personnel have recently been appointed as members of their emergency management organization and emergency response teams (ERTs). These personnel have participated in one JBEC emergency drill and have been given limited training. The JBEC ERTs consist of medical/first aid, fire fighting, and hazardous materials (HAZMAT). There is no emergency public information procedure developed by DOE/NPOSR-CUW for use during exercises, drills, and emergencies as required by DOE 5500.4A. All agreements for providing emergency services (e.g., fire department, law enforcement, ambulance services, hospitals, and airborne helicopter services) are verbal agreements. There are no formal agreements or letters of understanding with these support agencies. The other DOE/NPOSR-CUW facilities located in Utah and Colorado generally have only verbal agreements exist for emergency response from local emergency response agencies.

The format of the JBEC Emergency Management Plan does not comply with the DOE 5500-series and the DOE 5480-series of Orders. However, since there is no Safety Analysis Report (SAR), the site cannot ensure that all credible emergencies have been identified and used for decision-making and guidance for an emergency or exercise. The Standard Operating Procedures (SOP), DOE 5500.1 and DOE 5500.2, are not in compliance with DOE 5000.3A and DOE 5500.2B with respect to reporting of emergencies. JBEC has developed three emergency procedures including Medical, Security, and Spill Control.

JBEC does not have emergency procedures which address all credible emergency actions (e.g., emergency notifications and reporting, activation of emergency response organization and facilities, security, fire and natural phenomena events, protective actions for onsite and offsite populations).
The JBEC Emergency Preparedness Training Program is in the early stages of development, and there is no draft procedure which describes the functions and requirements of activities as specified in DOE 5500.3A. Some lesson plans or speaking outlines, training visuals, and job task analyses have not been developed.

JBEC has designated the ESH Training Room at the Upper Office Building, at NPR-3 as its emergency operating center (EOC). This facility can easily be rearranged and has sufficient space for the emergency management team. Within this building, there are two telephones, but offices within this building have three additional telephones that could be used. Radio communication is available to support onsite emergencies. Another radio is available for communications with offsite response agencies. The first aid treatment center, with a large supply of medical supplies and resources, is also located in this building. Radio and telephones are relied upon to disseminate emergency instructions, since there is no public address system available at the NPR-3 site. The EOC does not have an emergency back up power supply.

JBEC developed a very realistic, challenging, and aggressive emergency preparedness exercise scenario for the TSA Team. JBEC has conducted only one previous drill approximately one month prior to the commencement of the Tiger Team Assessment. The enthusiastic response and job knowledge of the JBEC emergency management and response organizations combined with their desire to perform during the exercise were favorable aspects identified by the TSA Team. The JBEC critique and videotape of that exercise identified weaknesses in emergency preparedness. The TSA exercise was also videotaped both at the on-scene control point and at the EOC operation. The TSA Team evaluated rated the exercise as satisfactory. This rating was achieved in spite of the fact that there has been little or no emergency response training given to the JBEC emergency response organization, there was a lack of emergency procedures, there was an inadequate emergency plan, and the emergency response organization was informally appointed.

JBEC has not developed procedures to address site-specific emergency action levels (EALs) for the hazardous chemicals stored or used at the site, and the emergency classification system is not in compliance with DOE 5500.2B. The JBEC emergency management plan and EALs have not been formally transmitted to local and state emergency management agencies for review. The emergency notification and reporting procedures developed by DOE/NPOSR-CUM are not in compliance with DOE Orders. DOE/NPOSR-CUM has not developed a SAR, but plans to complete this document in 1993. JBEC does not have a procedure to assess the hazards involved at NPR-3 and to provide protective actions to both onsite and offsite personnel.

JBEC has limited medical assistance capability. The medical staff consists of emergency medical technicians; these individuals are not certified by the State of Wyoming. A nurse or doctor is in attendance on a routine basis at NPR-3. The first aid treatment facility has adequate medical supplies for minor accidents, but not for major ones. Evacuation routes and assembly areas are not posted in all buildings throughout NPR-3. JBEC does not have a procedure to address site evacuation, sheltering, or personnel accountability.

The JBEC self-assessment was thorough and addressed all seven Emergency Preparedness concerns. The DOE/NPOSR-CUM self-assessment partially identified two of the three Emergency Preparedness concerns addressed to them.
FINDINGS:
- DOE/NPOSR-CUW has not documented arrangements, agreements, or understandings for obtaining emergency response assistance from offsite local response agencies (e.g., hospitals, ambulance service, life flight, fire department, and law enforcement agencies).
- DOE/NPOSR-CUW does not provide sufficient oversight to JBEC on emergency preparedness matters and does not maintain a documented Emergency Preparedness Program for all NPR-3 facilities.
- DOE/NPOSR-CUW has not developed a SAR.
- See Concerns FP.3-1 and FP.7-1, and Section EP.2.
- The following concern was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office does not have an Emergency Preparedness Program that is in compliance with the DOE 5500-series of Orders and with DOE 5480.1B.

EP.2 EMERGENCY PLAN AND IMPLEMENTING PROCEDURES

PERFORMANCE OBJECTIVE: The emergency plan, the emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

FINDINGS:
- The current JBEC Emergency Management Plan was not developed in accordance with DOE 5500.3A (e.g., it does not address all the responsibilities, credible emergencies, protective actions and emergency classifications, and it is not of prescribed format and content).
- JBEC Emergency Plan Implementing Procedures (EPIPs) do not address protective actions for onsite and offsite personnel; appropriate notifications and reporting of emergencies; emergency management and emergency response teams duties and responsibilities; emergency classification system and emergency action levels; personnel evacuations, assembly areas, and accountability; re-entry and recovery operations; and capability to obtain offsite emergency response from local agencies.
- Existing JBEC emergency procedures do not include emergency planning checklists for use during emergencies for all members of the emergency management and ERTs.
- JBEC has not developed Emergency Plan Administrative Procedures (EPAPs) to address routine emergency preparedness activities and functions (e.g., conduct of drills/exercises, emergency action item tracking system, maintenance, and reviews and appraisals of the Emergency Preparedness Program).
- See Concern FP.2-1.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor Emergency Management Plan and Emergency Plan Implementing Procedures do not address all facets of the emergency response functions and do not include Emergency Plan Administrative Procedures for conducting routine activities as specified in DOE 5500.1B and DOE 5500.3A.

FINDINGS:
- DOE/NPOSR-CUW has not formally transmitted a controlled copy of the JBEC Emergency Management Plan to FE-13, to local, and to state emergency management agencies for their review and coordination.
- DOE/NPOSR-CUW has not developed a site-specific SAR, but plans to complete one in 1993. (See Concern TS.2-1.)
- DOE/NPOSR-CUW has not prepared an emergency public information plan or developed any pre-formatted messages as required by DOE 5500.4A.
• DOE/NPOSR-CUW Emergency Notification Standard Operating Procedures SOPs 00.5500.1 and 00.5500.2 are not in compliance with DOE 5500.2B and DOE 5000.3A and have not been revised to address all verbal notifications and reports to be made to the DOE Headquarters EOC.

CONCERN: See Concern EP.1-2.

EP.3 EMERGENCY RESPONSE TRAINING

PERFORMANCE OBJECTIVE: Emergency response training should develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

FINDINGS:
• The JBEC Emergency Preparedness Training Program is not described in any document and is not in compliance with the OOE 5500-series of Orders.
  • JBEC has not trained all members of the ERT in personnel protection, HAZMAT response operations, and Self-Contained Breathing Apparatus (SCBA).
  • JBEC has not developed lesson plans, speaking outlines, and schedules for either employee orientation or training for their emergency management and response teams.
  • JBEC has not provided orientations and site tours to offsite emergency response assistance groups (e.g., fire, medical, law enforcement, local hospital).
  • Training records are not kept as required by DOE 5500.3A or DOE 1342.2, Records Disposition.
  • See Concern WS.4-9.
  • This concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor has not fully conducted emergency preparedness training, hazardous materials emergency response training, and personnel protective equipment training as required by DOE 5500.3A and 29 CFR 1910.120.

FINDINGS:
• DOE/NPOSR-CUW has not provided emergency response or SCBA training to all DOE/NPOSR-CUW employees who have not received HAZMAT and emergency response functions.
  • See Concern WS.4-9.
  • The following concern was not identified in DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not provided hazardous materials emergency response and personnel protective equipment training to their staff as required by DOE 5500.3A and 29 CFR 1910.120.
EMERGENCY PREPAREDNESS DRILLS AND EXERCISES

PERFORMANCE OBJECTIVE: Emergency preparedness programs should include provisions for simulated emergency drills and exercises to develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

NOTE: The drills and exercises referred to in this section are related to tests of and training on the emergency preparedness program. In many cases, these drills and exercises are best initiated using an operational situation. If accomplished that way, an additional benefit is gained by exercising the operations personnel and the interface between operations and emergency preparedness. Therefore, for maximum benefit, an operational drill or exercise can be used to lead into the emergency preparedness event, providing a drill or exercise to each program.

FINDINGS:
- JBEC had not developed an emergency preparedness annual drill/exercise schedule and has not documented procedures on development, conduct, control, and post-exercise activities.
- JBEC has provided limited emergency exercise/drift training to the controllers and evaluators.
- Weakness in the drill/exercise program are indicated by the following findings which were identified by the TSA Team in the exercise evaluation; these findings were not identified by the DOE/NPOSr-CUW and JBEC critiques of the exercise:
  - JBEC did not have medical/first aid forms to identify the injured person name, medical condition, degree of injury, type of contamination and what treatment was rendered at the site.
  - JBEC on-scene response team leaders were not identified.
  - JBEC did not perform any monitoring or environmental sampling.
  - Hot, warm, and cold zones were not established.
  - All required notifications were not performed.
  - Effective interfaces with DOE/NPOSr-CUW and the contract physician were not established.
  - The on-scene Commander did not establish a first aid triage area.
- Emergency communication drills have not been conducted on a quarterly basis by JBEC.
- The following concern was fully identified in the JBEC self-assessment (April 1992).
EP.5  EMERGENCY FACILITIES, EQUIPMENT, AND RESOURCES

PERFORMANCE OBJECTIVE: Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

FINDINGS:
- JBEC EOC does not have emergency power back up resource, (i.e., emergency generator or emergency battery power).
- Adequate status boards to depict emergency data and information were not available during the exercise.
- JBEC has not developed EPAPs for performing testing; inventory control; and service on emergency equipment, resources, and facilities.
- JBEC emergency management, support staff, and emergency response personnel do not have emergency checklists to ensure they assume and perform all their emergency response activities.
- JBEC does not have printed report forms and messages for use (e.g., initial notification and Follow-up Report, Emergency News Releases) as required by the DOE 5500-series of Orders.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor Emergency Operations Center does not have all equipment and the resources necessary to respond to an emergency as required by DOE 5500.2B, DOE 5500.3A, and DOE 5000.3A.

EP.6  EMERGENCY ASSESSMENT AND NOTIFICATION

PERFORMANCE OBJECTIVE: Emergency assessment and notification procedures should enable the emergency response organization to correctly classify emergencies, assess the consequences, notify emergency response personnel, and recommend appropriate actions.

FINDINGS:
- JBEC has not developed a system of emergency action levels to aid in the classification of emergency events, which assist in development of emergency protective measures (shelters or evacuation) for both onsite and offsite personnel.
- JBEC has not developed a report format for emergency medical/first aid treatment which addresses the name of the injured, degree or type of injury, type of contamination (if any), treatment provided, and any other emergency data required.
- JBEC does not have any EPIPs to address assessment of a chemical or HAZMAT release.
- Periodic messages were not issued by JBEC to update site personnel when emergency classifications were escalated or de-escalated and to provide special instructions and protective actions throughout the exercise.
- JBEC has not designated sufficient personnel to support the EOC Director in either expediting communications or in performing duties as runners and qualified status board keepers.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor Emergency Management Plan and the Emergency Plan Implementing Procedures do not address all emergency assessment actions as required by DOE 5500.3A and DOE 5480.1B.
PERSONNEL PROTECTION

PERFORMANCE OBJECTIVE: Personnel protection procedures should control and minimize personnel exposure to any hazardous materials during abnormalities, ensure that exposures are accurately determined and recorded, and ensure proper medical support.

FINDINGS:
- JBECS has not posted evacuation routes and special instructions in each building at the NPR-3 site.
- First aid kits are available in JBECS vehicles and other locations on NPR-3; however, their locations are not identified in any medical procedure, and such procedures do not identify an inspection requirement.
- JBECS does not have sufficient SCBA equipment and spare cylinders for emergency purposes, and their locations are not identified.
- Many SCBA cylinders delivered during the exercise and stored onsite were not fully charged. (See Appendix).
- The following concern was fully identified in the JBECS self-assessment (April 1992).

CONCERN: The operating contractor has neither developed all personnel protection instructions nor obtained necessary equipment for emergency purposes as required by DOE 5500.3A and DOE 5480.1B.

4.5.7 Technical Support

4.5.7.1 Overview

Four of the eight performance objectives in the Technical Support technical area were addressed in this appraisal. Performance objective TS.6 Packaging and Transportation of Hazardous Materials was appraised as a separate functional area in Section 4.5.8 Packaging and Transportation and performance objective TS.5 Environmental Impact was addressed in detail by the Environmental Subteam and is described in Chapter 3. Other areas not addressed were TS.7 Reactor Engineering and TS.8 Criticality Safety, both of which apply specifically to nuclear facilities. Interviews were held with Managers for Technical Service, Safety and Health, Facilities Engineering, and Maintenance; engineers, supervisors, and field support personnel; the Policies and Procedures Analyst; and the DOE/NPOSR-COM Director of Engineering. Documentation was reviewed and evaluated for project design and construction, facilities drawings, policies and procedures, and equipment performance monitoring and trends. ESH Self-Assessments for NPOSR-COM, dated April 1992, prepared by both JBECS and DOE/NPOSR-COM, were also reviewed and evaluated.

The technical support function at NPR-3 has a well defined organizational structure and responsibilities, but implementation of a fully effective program is yet to be realized. The SH Subteam has identified deficiencies in technical support, which can usually be related to not following the principles of formal quality found in conduct of operations. JBECS design and construction engineers, limited in number and in formal engineering training, have not always incorporated safety in the design and installation of facilities onsite. This has been expressed as a concern by the SH Subteam. Personnel located in Casper often do not spend enough time at the NPR-3 site to ensure effective technical support is provided to field operations. On the other hand, individuals working in the field believe that they run an effective operation without much assistance from the Technical Services Department. Engineering support for production to ensure operation at the maximum efficient rate appears to be going well; however, many other activities are conducted at NPR-3 that bypass engineering. Field work is often carried out without the benefit of accurate drawings, creating potential safety problems associated with lack of configuration control. The preparation, review, approval, and revision of Policy and Procedure documents are controlled very well and are performed in a timely manner. However, a concern of the SH Subteam is that independent safety and health review is not a formal requirement. Another concern is that there is no formal testing and surveillance program used to improve equipment safety and reliability.

Technical support to field operations at NPR-3 comes primarily from the Technical Services Department, which has the responsibility for facilities modifications, including design, construction, and inspection of all surface facilities, and for production engineering to ensure production of the reservoirs at the maximum efficient rate. Technical support is also provided by the Safety and Health Section, which reviews the safety of engineered projects and continuously supports the safety of operations. Organizational charts define the lines of communication and responsibility. Within each organization, position descriptions are used to list major accountabilities of personnel.
The Facilities Engineering Section, which is responsible for design and construction management, uses standard engineering practices with procedures for safety review and approval of design packages. DOE/NPOSR-CUW engineers monitor these projects closely and appear to have a good working relationship with JBEC engineers. Engineering support for mechanical and electrical problems in field maintenance and operations is not always effective. The S&H Subteam detected an attitude of "them versus us" among the JBEC engineers in Casper and the field maintenance and operations personnel. Engineers are not very visible in the field, and their presence is sometimes not welcome. The S&H Subteam also observed numerous deficiencies in equipment and systems that signal insufficient mechanical and electrical engineering support in the field. This has been expressed as a concern.

JBEC does not have an effective configuration control system to ensure that all drawings are maintained current as-built. Generally, drawings for facilities construction projects are kept up to date by Facilities Engineering, although subsequent field work may be performed over which they have no control of the drawings. As a result, follow-on field work is then conducted according to the memory of experienced personnel, because accurate piping drawings and electrical diagrams are not available. JBEC and DOE/NPOSR-CUW have both acknowledged this to be a serious safety concern and are working on corrective actions.

NPR-3 facilities are not covered by a Safety Analysis Report (SAR) which serves as the top-level safety document specifying operational limits, physical and administrative controls, safety systems, and surveillance requirements. Notes, cautions, and warnings appear in operation procedures without the basis of a full understanding of the hazards and risks involved. No formal hazards assessment has been performed for NPOSR-CUW. The more obvious hazards are well understood by the site personnel; however, the full range of accident conditions has not been addressed. DOE/NPOSR-CUW is taking the necessary steps to have a SAR in place in FY 1993.

Both the JBEC and the DOE/NPOSR-CUW self-assessments were comprehensive, critical appraisals of technical support for operations at NPOSR-CUW. All of the concerns expressed in this appraisal, as well as many other critical findings, were identified in both self-assessments. Causal factors, root causes, and corrective action schedules were presented, but resource allocations were not included. Analyses of findings in the JBEC self-assessment demonstrated a good understanding of the problems and applicable requirements. Analysis of findings by DOE/NPOSR-CUW was minimal.

4.5.7.2 Findings and Concerns

TS.2 PROCEDURES AND DOCUMENTS

PERFORMANCE OBJECTIVE: Technical support procedures and documents should provide appropriate direction, allow for adequate record generation and maintenance for important activities, and be properly and effectively used to support safe operation of all facilities on the site.

FINDINGS:

- Facilities at NPR-3 are not covered by a SAR, which serves as the top-level safety document to describe the safety envelope of operational limits, engineered and administrative controls, safety systems, and surveillance requirements, in accordance with DOE 5481.18.
- Safety analysis information is not incorporated in JBEC Policy and Procedure documents or in operation and maintenance procedures in accordance with DOE 5480.19 and DOE 4330.4A.
- No formal hazards assessment has been performed for NPOSR-CUW.
- No hazards analysis has been performed for NPR-3 which meets the requirements of 29 CFR 1910.119 for a Process Hazards Management Program.
- The range of credible emergencies that could affect NPR-3, based on site-specific safety analyses of potential abnormal conditions, has not been addressed as required by DOE 5500.3A. (See Section EP.2)
- A memorandum from Ken Roberts, DOE/NPOSR-CUW, to K. Brown, JBEC, dated June 19, 1992, states that implementation of a Strategic Plan for Safety Analysis at NPR-3 will include the preparation of a SAR, meeting or exceeding the requirements of DOE 5481.18, to be completed sometime in FY 1993.
- See Concerns PT.6-4, FP.3-1, and FP.7-1.
- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not ensured that facilities at the Naval Petroleum Reserve Number 3 are covered by a Safety Analysis Report as required by DOE 5481.18.

FINDINGS:

- Operations for technical support are generally governed by Policy and Procedure documents, although some will be covered by operational procedures, which are now in draft only.
• Policy and Procedure 5.4-08, "Operation Procedure Preparation and Distribution," dated June 1, 1992, states that the Safety and Health Manager is responsible for reviewing, revising, and approving operation procedures, to comply with safety and health standards, rules, and regulations. Policy and Procedure 5.4-01, "Policy and Procedure Preparation and Distribution," dated June 1, 1992, does not state that same responsibility for safety and health review and approval.

• The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not formally require an independent safety and health review in the preparation and revision of Policy and Procedure documents.

TS.3 FACILITIES MODIFICATIONS

PERFORMANCE OBJECTIVE: Technical support services required by each facility on the site to execute modifications should be carried out in accordance with sound engineering principles that assure proper design, review, control, implementation, and documentation in a timely manner.

FINDINGS: • Field operations receive engineering technical support for facilities modifications and production services, but S&H Subteam members were frequently informed that engineering technical support for mechanical and electrical problems in the field was inadequate.

• The S&H Subteam found no evidence that engineers in the Technical Services Department are involved in tracking and trending equipment failures to improve reliability and safety.

• The S&H Subteam found that engineers in the Technical Services Department are not involved in the maintenance/operations planning meetings held each morning at the site.

• Policies and procedures do not effectively control maintenance work that should receive engineering input. The S&H Subteam was informed by field personnel that maintenance work is performed with the viewpoint that, "We don't get daily support from engineering -- if we think we can do it, we do it."

• Examples of deficiencies in equipment and systems that can be attributed to insufficient engineering technical support were identified by S&H Subteam members in the field as follows:
  - Improper steam generator discharge lines,
  - Removal of relief valves from pump discharge,
  - Undersized relief valve on fuel gas scrubber,
  - Improper design of a vent/Basic Sediment and Water (BS&W) concrete box,
  - Improper grounding of equipment,
  - Failure to meet hazardous area electrical requirements, and
  - Field fabricated non-code pressure vessel.

• Additional examples include:
  - A pressure relief valve on the quintiplex charge pump on Steam Generator No. 1 can discharge water at 1,300 psi and 160°F into the buildings, because the relief valve is not properly connected to the suction piping,
  - At the LTS truck loading rack, there is no automatic pump shut down, if the electrical ground is deficient.

• See Concerns OP.1-2, MA.1-1, MA. 5-1, and WS. 4-5.
The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not provide effective electrical and mechanical engineering support to field operations at Naval Petroleum Reserve Number 3.

FINDINGS:
- The LTS Gas Plant engineering design did not provide for an Emergency Shutdown (ESD) station at the main exit/entrance gate.
- Design review did not prevent the LTS Gas Plant control room building from being improperly orientated on location to provide for best protection from site hazards. For example, the two egress doors opened on the process side of the building and there were no other outside doors. Air intake vents and building air conditioning equipment are also located on the process side of the building, which could provide an ignition source for natural gas releases.
- Design review did not prevent the LTS Gas Plant office building and main entrance road from being located in a hazardous (i.e., electrically classified) area.
- Site/facility fire protection standards have not been established and incorporated in the plans and specifications for all new buildings and major modifications of existing buildings as required by DOE 6430.1A.
- See Concerns WS.4-7, FP.5-1, MA.1-1, and MA.5-1.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not effectively incorporate safety in the engineering design and installation of facilities at Naval Petroleum Reserve Number 3 in accordance with DOE 6430.1A.

FINDINGS:
- The S&H Subteam found that Facilities Engineering has effective control of as-built drawings for inhouse and subcontractor facilities modifications, but considerable field work is performed over which they have no control. There has been no determination as to which or how many as-built drawings are inaccurate.
- Often field work is performed according to the memory of experienced personnel, because as-built drawings of piping and instrumentation diagrams are not available.
- Technically accurate and up to date drawings are not always used to provide appropriate work direction and to ensure that field work is performed safely and efficiently in accordance with DOE 4330.4A.

CONCERN: Audit Report No. ADC-90-008, Construction and Quality Assurance, dated September 19, 1990, recommended that JBEC review its policies and procedures for preparing as-built drawings and ensure that the drawings are accurate. As a result of the review, a letter from C. Ray Williams, DOE/NPSR-CUN Director, to Michael R. Fosdick, JBEC General Manager, dated October 10, 1991, stated that a management review determined a serious safety concern existed because as-built drawings were not being adequately revised, and onsite workmen did not have current prints with which to work.

The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not have an effective program to ensure that piping and instrumentation diagrams and other drawings are maintained current as-built in accordance with DOE 4330.4A.
TS.4 EQUIPMENT PERFORMANCE TESTING AND MONITORING

PERFORMANCE OBJECTIVE: Effective equipment performance testing and monitoring should be performed by technical support groups to ensure that equipment and system performance is within established safety parameters and limits.

FINDINGS:

- JBEC does not have a formal performance testing and surveillance program to improve reliability and safety of equipment and systems for operations.

- There is no sitewide preventive maintenance and quality controlled calibration program that meets the requirements of DOE 4330.3A. For example, at the water plant, pressure relief valves had recently been sent offsite for maintenance and calibration. This was corrective maintenance, but it was not part of a preventive maintenance and calibration program.

- The maintenance organization does not have a formal program of tracking and trending equipment failures as required by DOE 4330.3A.

- An internal effort in Field Support to extend the life of downhole pumps was identified by the S&M Subteam as a good example of equipment improvements, but it was not part of a documented JBEC program.

- The position description for the JBEC Quality Management Coordinator lists the following responsibilities:
  - investigates material and equipment failures in a timely manner, and initiates accurate and appropriate reports to management for correction of substandard conditions; and
  - analyzes failure incidents to predict potential failure frequency and project impact.

- The S&M Subteam found no evidence that these activities have yet been implemented.

- See Concern MA-6.1.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not have a formal program to collect, trend, and analyze performance data for equipment and systems important to operations and safety at Naval Petroleum Reserve Number 3 as required in DOE 4330.3A.

4.5.8 Packaging and Transportation

4.5.8.1 Overview

The 13 performance objectives of the Packaging and Transportation technical area were addressed during this appraisal. Interviews were held with personnel responsible for the safe packaging, storage, and movement of hazardous materials and hazardous wastes, and for aviation transportation. Facilities for the receipt, storage, and onsite and offsite transportation of hazardous materials were visited. Transportation policy statements and procedures were examined, and operations for vehicles, equipment, and pipelines observed. Shipping, receiving and storage, and maintenance records were reviewed, and the results of classification, packaging, marking, labeling, and placarding activities were examined.

Hazardous materials transportation movements by vehicle have been conducted without incident, and there have been no pipeline accidents in the past 12 years. This excellent record is due, in part, to the close attention given to such movements by the staff of JBEC, and to the small number of movements (e.g., about 100, 55-gallon drums containing materials such as vehicle maintenance lubricants or solvents are received each year). Hazardous wastes are shipped in compliance with DOE Orders, and Federal and state regulations. Other shipments, however, are not in compliance with these requirements.

Although the DOE/NPOSR-CUW and JBEC staff are competent in their jobs insofar as they have been trained, there is a general unawareness of the requirements for the safe transportation of hazardous materials. In some cases, adequate knowledge of and skill in job performance is lacking. The appraisal team found a universally positive attitude toward the safe transportation of hazardous materials and aviation safety, however. The DOE/NPOSR-CUW staff provides few instructions and guidance regarding packaging and transportation operations to JBEC and relies excessively on the decisions of the contractor to ensure safe packaging and transportation operations. The cognizance of the DOE/NPOSR-CUW staff in some packaging and transportation technical areas is greater than that of JBEC employees, but less in other areas. As a result, compliance with packaging and transportation requirements for different types of hazardous materials is inconsistent.

The genesis of the weakness in the packaging and transportation program conducted by DOE/NPOSR-CUW and JBEC is the lack of policies and procedures for complying with DOE requirements. The lack of adherence to DOE Orders is the reason for most of the findings of this appraisal. In addition, authority and responsibility assignments are not clear, and the result has been confusion and lack of coordination among those carrying out hazardous materials operation. A large degree of unawareness of the specific requirements applicable to the site has exacerbated compliance with the requirements.

Unfortunately, a training program has not been developed and implemented to help employees gain the knowledge and skills necessary to perform their jobs satisfactorily. The absence of efforts to develop a quality assurance program and to conduct safety appraisals, until very recently, has permitted these weaknesses to remain.

The location of a public road, and the concomitant need to comply with Department of Transportation (DOT) packaging, marking, labeling, placarding, and shipping paper regulations, has added complexity to the packaging and transportation program. Also, the delivery of methanol and glycol to the LTS
Gas Plant by cargo trucks regulated by DOT has increased the scope of mandatory knowledge of DOE and DOT requirements, as has the movement of propane, butane-gasoline mix, and crude oil from the site by cargo truck. The relatively small number of movements onto, on, and off the site, has probably contributed to the lack of accidents. Even so, required analyses have not been accomplished to evaluate the potential for risks associated with hazardous materials transportation. The corrosion protection program follows National Association of Corrosion Engineers (NACE) recommended practices, but not all locations meet the minus 850 millivolt protection level. Nor has sufficient training been given to those in the program to allow them to have the insight of a qualified practitioner, as required by DOE.

The appraisal team found that the attitude of both DOE/NPOSR-CUW and JBEC employees toward safe packaging and transportation of hazardous materials was positive and constructive, and particularly in the recent past, very proactive. There is a desire to know the DOE requirements, and ways to comply.

The JBEC self-assessment addressed 6 of the 10 JBEC concerns identified by the S&H Subteam, partially addressed 2, and did not address 2. This assessment covered each criterion in the packaging and transportation discipline in a clear, albeit limited, discussion. The criteria which JBEC considered not applicable to NPR-3 were so noted. Causal factors and root causes were presented, but not resource allocations. The schedules for implementation were very optimistic.

The DOE/NPOSR-CUW self-assessment addressed two of the three DOE/NPOSR-CUW concerns and did not address one. This assessment covered only the QA performance objective, although some of the criteria from the other objectives were included. Altogether, 26 percent of the criteria were discussed very superficially. Root causes were presented for all Safety and Health Findings; none included specific comments of the packaging and transportation technical area. Causal factors were not presented. The Corrective Action Plan was brief and did not include estimates of resource allocations or a detailed schedule. As such, implementation efforts will be difficult to monitor and control.

4.5.8.2 Findings and Concerns

PT. 1 ADMINISTRATION AND ORGANIZATION

PERFORMANCE OBJECTIVE: Management should develop and implement a system of policies and directives that will provide for effective implementation of Department of Energy Orders, particularly DOE 5480.3, DOE 1540.1, DOE 1540.2, Federal and State regulations, and good industrial practices, in operations involving packaging and transportation of hazardous materials.

FINDINGS:
- DOE/NPOSR-CUW does not have a formal system for implementing DOE Orders on packaging and transportation. There are no requirements for format, content, and schedule for issuance.
- DOE/NPOSR-CUW has issued a policy statement on DOE 5480.3 and DOE 1540.1, but not on DOE 1540.2 or on Federal and state regulations or industrial practices. The existing statements are too brief and unspecific to provide adequate instructions and guidance to JBEC.
- DOE/NPOSR-CUW has not assigned the authority and responsibility for all packaging and transportation activities according to a formal procedure as required by DOE 5480.19. Assignments which have been made are included in position descriptions in some cases, and in instructions to prepare policy directives in other cases. The lack of a formal procedure has resulted in inconsistent and incomplete coverage of the requirements.
- No DOE/NPOSR-CUW individual is assigned overall responsibility for packaging and transportation activities. This fragmentation has resulted in confusion and different interpretations in the implementation of DOE Orders and DOT regulations.
- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not established a policy for implementation of DOE 5480.3, DOE 1540.1, and DOE 1540.2, or the responsibility and authority for the shipment of hazardous materials as required by DOE 5480.19.

FINDINGS:
- DOE/NPOSR-CUW does not have a formal system for implementing DOE Orders on packaging and transportation. Partial compliance with some Orders is accomplished informally, but neither effectively nor efficiently.
- JBEC does not have a system to ensure that employees responsible for packaging and transportation operations are provided accurate operating documents.
- JBEC has not issued implementation procedures for DOE 5480.3, DOE 1540.1, and DOE 1540.2, or for Federal and state regulations or industry practices. Policy and procedures documents are being prepared, but none is completed. The
drafts which the S&H subteam reviewed are not specific and lack several items with respect to DOE Orders and DOT regulations.

- JBECA has not established a packaging and transportation safety committee to coordinate effective implementation of DOE Orders for the storage and movement of hazardous materials. The lack of a committee has exacerbated effective management communications.

- JBECA has not assigned the authority and responsibility for packaging and transportation activities to a JBECA employee. JBECA staff, in general, are not aware of their responsibilities with respect to DOE Orders and DOT regulations.

- The following concern was fully identified in the JBECA self-assessment (April 1992).

CONCERN: The operating contractor has not established a policy for the implementation of DOE 5480.3, DOE 1540.1, and DOE 1540.2, or the responsibility and authority for the shipment of hazardous materials as required by DOE 5480.19.

PT.2 TRAINING

PERFORMANCE OBJECTIVE: Personnel should be trained, qualified, and certified in handling hazardous materials as required by DOE 5480.3 and 49 CFR.

FINDINGS:

- JBECA does not have a training program in hazardous materials packaging and transportation operations. An effort to develop a training program is under way, but was not finished as of the date of this appraisal.

- JBECA staff members have not received hazardous materials transportation training as required by 49 CFR 173.11(b), although several individuals conduct operations involving hazardous materials.

- JBECA has not performed job task analyses of packaging and transportation related positions.

- JBECA personnel have not received training in receiving and storage, onsite, or offsite movements of hazardous materials. They have not received training in vehicle maintenance and certification and in emergency response requirements (i.e., 49 CFR 396, 49 CFR 600-604). JBECA personnel have not received training in the safe transportation of gases and petroleum liquids by pipeline as required by 49 CFR 192 and 49 CFR 195.

- JBECA does not have a continuing training program for operating and maintenance personnel such as those working on corrosion protection as required by 49 CFR 195.403(a). Except for welders who are certified per API 1104, Standards for Welding Pipe Lines and Related Facilities, pipeline maintenance personnel are not included in a documented training program.

- See Concerns TC.1-1, EP.3-1, EP.3-2, WS.4-9, and FP.3-1.

- The following concern was fully identified in the JBECA self-assessment (April 1992).

CONCERN: The operating contractor does not have a training program for personnel involved in hazardous materials packaging and transportation operations as required by DOE 5480.3, DOE 5480.1B, and 49 CFR.
PT.3 QUALITY ASSURANCE

PERFORMANCE OBJECTIVE: A system of checks and balances should exist that ensures the quality assurance requirements of the applicable Department of Energy Orders, especially DOE 5700.6C, and ASME NQA-1-1989 are met.

FINDINGS:
• DOE/NPOSR-CUW does not have a quality assurance (QA) program in accordance with DOE 5700.6C for packaging and transportation operations.
• DOE/NPOSR-CUW management has not periodically assessed packaging and transportation operations at NPR-3, NOSR-1, and NOSR-3.
• DOE/NPOSR-CUW does not have personnel trained and qualified to ensure implementation of DOE 5700.6C. DOE/NPOSR-CUW has assigned the responsibility for QA to the civil engineer who has not had QA training.
• DOE/NPOSR-CUW has implemented DOE 6430.1A, General Design Criteria, as the standard for packaging and transportation technical designs, particularly pipeline designs, but has not implemented the design standards of 49 CFR 192 and 49 CFR 195, or industry standards such as ANSI B31.4, Liquid Petroleum Transportation Piping Standards. This lack of compliance with Performance Criterion 6 of DOE 5700.6C has placed JBEC in an area of uncertainty in designing piping items.

CONCERN: See Concern QV.1-2.

FINDINGS:
• JBEC does not have a QA program, but has initiated developmental efforts.
• JBEC has not conducted QA audits of their packaging and transportation activities.
• JBEC does not have personnel trained and qualified to perform QA audits. This deficiency is recognized by JBEC management. JBEC intends to train existing personnel for QA work, keeping in mind the principle of independence of appraisers.
• JBEC has recognized the lack of a QA program regarding NPR-3, but not the lack of a program regarding NOSR-1 and NOSR-3.

CONCERN: See Concern QV.1-1.

PT.4 REGULATORY COMPLIANCE

PERFORMANCE OBJECTIVE: All packaging and transportation operations involving hazardous materials should be conducted in compliance with the applicable Federal and State regulations, including those of the Department of Transportation, the Nuclear Regulatory Commission, the Occupational Safety and Health Administration, and the Environmental Protection Agency.

FINDINGS:
• A public road transverses NPR-3. JBEC transports hazardous materials on the road in motor vehicles. Because of the transportation of the hazardous materials on the public road, vehicles and drivers must comply with 49 CFR. DOE/NPOSR-CUW staff does not understand all the requirements, and have not acted to comply with 49 CFR requirements.
• DOE/NPOSR-CUW owns two vacuum trucks used at NPR-3 to transport hazardous materials. Neither truck has a cargo tank specification plate as required by 49 CFR.
• The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office is not in compliance with 49 CFR 392, 49 CFR 396, and 49 CFR 172 with regard to shipments of hazardous materials.

FINDINGS:
• The trucks operated by JBEC which are transporting hazardous materials have 49 CFR placard holders installed, but the proper placards are not consistently displayed.
• JBEC is aware of the requirement that JBEC must meet 49 CFR, but does not comply with all of the requirements of 49 CFR. For example, proper shipping papers are not prepared.
• JBEC does not have a program to ensure compliance with regulatory requirements. Some regulations (e.g., those for the transportation of hazardous wastes) are complied with, but this result is not because of a compliance program.
• JBEC has a plan for the implementation of future hazardous materials regulatory changes. Documents which contain such changes will be reviewed. No specific assignment(s) has been made for analyzing regulatory changes, and implementation of the plan has not been accomplished.
• The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor movements of hazardous materials do not comply with the safety requirements of DOE 5480.3 and 49 CFR.
CONCERN:

FINDINGS:

- JBEC warehouse personnel do not inspect incoming hazardous materials shipments for compliance with 49 CFR. They have little knowledge of the requirements.
- JBEC warehouse personnel do not inspect vehicles delivering hazardous materials for compliance with DOE Orders and 49 CFR.
- The containment area at the warehouse is of insufficient volume to contain the 55-gallon drums of hazardous materials stored in the area.
- The documentation of the shipments of hazardous materials from the warehouse is incomplete. There is no documentation of the storage areas of hazardous materials on NPR-3. There is general knowledge of the location of hazardous materials on site, but, there is no tracking of the movements of hazardous materials.
- Gas cylinders stored in the warehouse are not inspected by JBEC for test dates, or for other requirements in 49 CFR.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not conduct hazardous materials activities at the warehouse in compliance with DOE 5480.3 and 49 CFR.

FINDINGS:

- JBEC does not have a policy and procedure for the receipt of methanol or glycol at the LTS Gas Plant. A procedure is being developed. The draft of the procedure does not reference DOE 5480.3 or 49 CFR, and does not contain instructions for the operator to follow when refusing a shipment.
- The SH subteam reviewed the shipping paper for a shipment of methanol to the LTS Gas Plant. The shipment was not in compliance with the requirements of 49 CFR, because the shipper had not signed the shipping paper certifying that the shipment was safe. The shipment was accepted by the operator.
- JBEC does not have a procedure for loading trucks at the LTS Gas Plant. The operator uses a checklist which does not reference 49 CFR, and is incomplete in other respects. In particular, the checklist does not include the signature of the operator as the shipper, certifying that the shipment is properly packaged, marked, and labeled and in all respects in proper condition for transport by highway according to 49 CFR.
- JBEC does not inspect vehicles delivering hazardous materials shipments to NPR-3 at the site entrance for compliance with safety requirements as they did before such inspections were discontinued in the early 1980s. The inspections helped ensure the safety of the shipments on the site.
- JBEC does not inspect all crude oil trucks loading crude oil at the B-TP-10 Battery for offsite shipment. There is no procedure for such inspections. Trucks can be driven to the loading Battery, be loaded, and depart without the presence of a JBEC employee. A JBEC employee does not sign the shipping paper for a shipment, as required by DOE 5480.3 and 49 CFR.
- During a loading sequence witnessed by the SH subteam, the truck driver properly attached the grounding cable to the truck and the loading skid. However, a proper grounding of the truck was not obtained because the skid was not connected to a grounding rod. The tank had a DOT MC 306-AL specification plate attached and a current DOT test date.
- When the truck noted above departed, neither the Pumper nor the truck driver had signed the shipping paper certifying that the shipment of oil met DOT requirements.
- The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: See Concerns 05.3-1, 15.2-1, FP.3-1, and FP.7-1.

FINDINGS:

- JBEC does not have a program for analyzing the risks associated with the packaging and transportation of hazardous materials.
- JBEC Production operations staff has analyzed pipeline leaks for the purpose of determining when to replace a pipeline as opposed to repairing it, but there is no procedure to implement the results of the analysis or to evaluate the results.
- JBEC annually takes cathodic protection pipe to soil voltage potential readings at NPR-3. Some of the voltages recorded during the September/October 1991 inspection did not meet the minus 850 millivolt requirement of NACE standard RP-69-01 as referenced in DOE 5480.3 and 49 CFR. No formal action was taken to correct the deficiency.
- JBEC only annually inspects cathodic protection rectifiers at NPR-3, not at intervals not exceeding 2.5 months, but at least 6 times each calendar year as required by 49 CFR.
- JBEC subcontracted for the cathodic protection system at NOSR-3 to be inspected in February 1990; the results met 49 CFR standards. An inspection was not conducted in either 1991 or in 1992 as required by 49 CFR.

- JBEC has not inspected the cathodic protection system at NOSR-1 at intervals not exceeding 15 months; 49 CFR requires inspection at least once each calendar year.

- Some of the coatings and wrappings at the pipe to ground surface interface on pipelines at NPR-3 have deteriorated to the point where the pipe is not being protected from external corrosion (e.g., the B-TP-10 Battery and the South Terminal). The lack of protection is a violation of 49 CFR.

- JBEC has no procedure to measure and record the extent of piping internal wall corrosion when an internal wall is exposed, as required by 49 CFR.

- JBEC maintenance employees visually examine pipe internal walls for corrosion when possible, but do not measure the extent of corrosion nor record the results as required by 49 CFR.

- The following concern was not identified in the JBEC self-assessment (April 1992).

**CONCERN:** The operating contractor is not in compliance with the pipe internal and external wall corrosion control requirements of 49 CFR.

**FINDINGS:**
- An Amoco petroleum pipeline is located on NPR-3 along the Eastern border of the site from the North-South midpoint to the South Terminal. The pipeline is marked with warning signs which comply with 49 CFR. JBEC has not analyzed the potential risks associated with this pipeline.

- The Amoco pipeline crossing NPR-3 is not in proximity to the NPR-3 facilities other than the Bad Oil Facility in Section 2, Township 38 North, Range 78 West. JBEC has not investigated the consequences of this pipeline on the Bad Oil Facility.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

**CONCERN:** The operating contractor has not ensured that the condition of the third party pipeline crossing Naval Petroleum Reserve Number 3 will not adversely affect safety at the site.

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**PT.8 ONSITE TRANSFERS**

**PERFORMANCE OBJECTIVE:** Onsite transfers of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures that ensure conformance with applicable standards and accepted safety practices.

**FINDINGS:**
- JBEC does not have procedures for the safe onsite transfer of hazardous materials at NOSR-3.

- JBEC does not conduct movements of hazardous materials at NPR-3 in accordance with DOE Orders and 49 CFR. For example, records of movements are not complete and consistent with these requirements, correct placards are not always used, and specification tanks are not used.

**CONCERN:** See Concern PT-4-2.
PT. 9 OFFSITE SHIPMENTS

PERFORMANCE OBJECTIVE: Offsite shipments of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures that ensure conformance with applicable regulations, standards, and accepted practices.

FINDINGS:
- JBEC does not have procedures for the safe offsite transfer of hazardous materials at NPR-3.
- JBEC does not conduct offsite shipments of hazardous materials at NPR-3 in accordance with DOE Orders and 49 CFR. For example, records of movements are not complete and consistent with these requirements, and inspections are not conducted.

CONCERN: See Concern PT. 4-2.

PT. 10 RECORDS

PERFORMANCE OBJECTIVE: Records of hazardous materials movements, transfers, and shipments should be prepared and maintained to ensure compliance with Department of Energy and other regulatory requirements, and to provide an auditable trail of actions.

FINDINGS:
- JBEC does not have a procedure for implementing the record-keeping requirements of DOE 5480.3.
- Except for hazardous waste shipment records, JBEC records of hazardous materials shipments are not complete and maintained as required by DOE 5480.3. For example, shipping papers are not prepared which contain a provision for a signature of a JBEC employee certifying that a shipment meets 49 CFR.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not prepare and maintain records of hazardous materials movements as required by DOE 5480.3.
APPRAISALS AND INTERNAL AUDITS

PERFORMANCE OBJECTIVE: Periodic Packaging and Transportation safety appraisals of contractors by the Field Office, and independent internal Packaging and Transportation safety audits by each contractor are required by DOE 5480.3 and 5482.1B.

FINDINGS:
- DOE/NPOS-CUW does not have a documented program for conducting safety appraisals of JBEC packaging and transportation operations.
- DOE/NPOS-CUW has not conducted an appraisal of JBEC in accordance with DOE 5482.1B and 49 CFR.
- DOE/NPOS-CUW employees have had little training in ES&H appraisal activities.
- DOE/NPOS-CUW conducts informal appraisals of JBEC hazardous materials operations, but it neither documents the results nor requires corrective action plans of JBEC.
- See Concern OS.I-2.

CONCERN: See Concern FR.4-2.

PACKAGING AND STORAGE PROCEDURES

PERFORMANCE OBJECTIVE: All packaging and storage procedures for hazardous material are in conformance with DOE 5480.3, 49 CFR, and 40 CFR.

FINDINGS:
- Real time master inventories of the hazardous materials stored in Flammable Storage Units are not available for immediate use by JBEC personnel in the event of a nearby fire or other emergency.
- Except for the procedures for the packaging of hazardous wastes, JBEC does not have procedures for the packaging of hazardous materials, as required by DOE 5480.3.
- Radioactive materials have been stored improperly with other chemicals in the warehouse; the requirements of 49 CFR have not been met.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor hazardous materials packaging and storage procedures are not in conformance with DOE 5480.3.
4.5.9 Site/Facility Safety Review

4.5.9.1 Overview

All six performance objectives relating to the Technical area of Site/Facility Safety Review were addressed. Interviews were conducted with members of the Safety Review Committee, operations and safety personnel, and JBEC Policies and Procedures and DOE Orders were reviewed. Minutes of eight Safety Review Committee (SRC) meetings and two General Manager/Field Employee Safety Meetings were reviewed. A meeting of eight hourly employees, who attend the General Manager/Field Employee Safety Meetings as representatives of field personnel, was attended on June 29, 1992.

A JBEC Safety Review Committee does exist. Minutes of Committee meetings revealed that members provide information of a safety nature and that the members are at times the individuals who take action on a particular subject. DOE 5482.1B, Environmental, Safety, and Health Appraisal Program, states that the primary function of members is as advisers to management. Because of the small number of employees at NPR-3 creating the necessity that the Committee be composed of some management personnel rather than entirely of technical non-management personnel, the existing Safety Review Committee is acceptable in terms of representation of management level personnel.

The SRC is providing some good results to improve safety at NPR-3 but, many important areas with possible safety questions are not being addressed. Among them are organization and staffing, operational procedures, and hazards assessment. A review of Committee minutes revealed discussions of accidents, but there was no apparent rigorous investigation of root causes and monitoring of safe/unsafe industry operation experience. The failure to include such topics as part of their scope is considered to be a major failing of the Committee. DOE 5482.1B, Environmental, Safety, and Health Appraisal Program, presents areas for objective review.

Technical safety reviews are performed at NPR-3 project planning meetings. Agenda items include new equipment and modifications to old equipment. The Safety and Health Manager must approve such projects before they can be initiated. He is aware of these projects during their initial planning as a member of the Planning and Control Committee.

Of concern is the failure to have Safety Review Committee meetings when scheduled, the absence of a periodic operating review of the facility, and the absence of a triennial appraisal of the Safety Review System. JBEC did conduct an internal review in 1991, identified as the 1991 Safety and Health Department Audit. However, it did not satisfy the requirements of reviewing the overall operation to ensure adequate ES&H coverage as required by DOE 5482.1B.

DOE/NPOSR-CUW has neither provided surveillance and oversight of JBEC's internal safety review system nor have they conducted functional appraisals of JBEC activities to ensure an effective ES&H program as outlined in DOE 5482.1B. By their inaction, DOE/NPOSR-CUW has played a major role in the failure to fully implement the ES&H program at NPOSR.

Both JBEC and DOE/NPOSR-CUW self-assessments addressed concerns found by the S&H Subteam. DOE/NPOSR-CUW frequently used the same response for different
subjects and stated that the corrective action plans would be implemented after the Tiger Team visit. JBEC's corrective action plans appeared to provide more immediate and focused responses. Concerns were analyzed for root causes by both organizations.

4.5.9.2 Findings and Concerns

FR.1 SAFETY REVIEW COMMITTEE

PERFORMANCE OBJECTIVE: A Safety Review Committee should be available to review safety questions and the safety impacts of experiments. This committee is part of the "Contractor Independent Review and Appraisal System" specified in DOE 5482.1B, Section 9.d.

FINDINGS:
• The JBEC Safety Review Committee is charged in Policy and Procedure 1.3-02, "Organizational Safety Responsibility," to ensure maintenance and establishment of new safety and health programs to protect JBEC employees and subcontractors. The Committee has no formal charter.

• Committee meeting minutes usually designate action items and the name of the person taking action with the expected completion date, but that information is not provided for all action items.

• No procedure exists for handling situations in which a member should abstain from voting because of a conflict of interest.

• The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor Safety Review Committee does not have a charter specifying responsibility, authority, quorum, reporting requirements, and documentation in accordance with DOE 5482.1B.
FR.2 SAFETY REVIEW TOPICS

PERFORMANCE OBJECTIVE: Items that require review by the Safety Review Committee should be well defined and understood by facility management.

FINDINGS:
- The responsibilities of the Safety Review Committee in Policy and Procedure 1.3-02, "Organizational Safety Responsibility," are narrow in scope when compared to those listed in DOE 5482.1B, Section 9d.
- No mechanism exists to gather items for review at Safety Review Committee meetings.
- The Safety Review Committee minutes did not provide evidence that safety matters are addressed in depth to resolve questions about proposed modifications to plant and equipment, organization and staffing, operational procedures and significant changes, hazards assessment, and emergency preparedness.
- The following concern was fully identified in the JBEC self-assessment (April 1992): The operating contractor Safety Review Committee does not ensure comprehensive and in-depth reviews of all major items important to the safety of operations in accordance with DOE 5482.1B.

CONCERN:
(FR.2-1) (H2/C1)

FR.3 OPERATION OF SAFETY REVIEW COMMITTEE

PERFORMANCE OBJECTIVE: Review of site/facility activities by the Safety Review Committee should ensure achievement of a high degree of safety.

FINDINGS:
- The Safety Review Committee meetings are to convene monthly per JBEC Policy and Procedure 1.3-02, "Organizational Safety Responsibility." A review of the meeting minutes reveals 2 months out of the past 11 when there was no meeting.
- Monthly Safety Review Committee meetings are rescheduled to assure attendance of members, thereby delaying prompt action towards identification and resolution of safety issues.
- The following concern was partially identified in the JBEC self-assessment (April 1992): The operating contractor Safety Review Committee irregularly holds meetings which contradicts their Policy and Procedure 1.3-02.

CONCERN:
(FR.3-1) (H2/C1)
FR.4 FACILITY SAFETY REVIEW

PERFORMANCE OBJECTIVE: A periodic operating review of the facility should be performed by a committee appointed by top contractor management as specified in DOE 5482.1B.

FINDINGS:
- There is no JEC policy and procedure for a facility safety review to ensure ES&H coverage as required by DOE 5482.1B, which calls for an overall periodic review of the operation at each facility.
- Packaging and transportation operations were not appraised periodically by JEC as required by DOE 5482.1B.
- The 1991 Safety and Health Department Audit did not address all items specified in DOE 5482.1B, Section 9.d.
- The following concern was fully identified in the JEC self-assessment (April 1992).

CONCERN: The operating contractor does not perform periodic appraisals of the overall operation of each facility to ensure safety and health coverage as required by DOE 5482.1B.

FINDINGS:
- DOE/NPOSR-CUW did not enforce the implementation of DOE 5482.1B.
- DOE/NPOSR-CUW did not review or provide oversight for a periodic safety review system.
- DOE/NPOSR-CUW has no audit or appraisal system in place to ensure JEC compliance with DOE 5482.1B.
- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not conducted functional appraisals to ensure safety and health coverage as required by DOE 5482.1B.

FR.5 TRIENNIAL APPRAISAL OF SITE/FACILITY SAFETY REVIEW SYSTEM

PERFORMANCE OBJECTIVE: A triennial appraisal of the safety review system should be performed by contractor management.

FINDINGS:
- DOE 5482.1B requires an independent appraisal of the safety review system every 3 years, but there has been none at NNR-3.
- JEC Policy and Procedures do not require a triennial appraisal of the safety review system.
- The following concern was fully identified in JEC self-assessment (April 1992).

CONCERN: The operating contractor has not conducted independent triennial appraisals of its safety and health internal review system as required by DOE 5482.1B.

FINDINGS:
- DOE/NPOSR-CUW did not enforce the implementation of DOE 5482.1B.
- DOE/NPOSR-CUW did not review or provide oversight of a triennial facility appraisal.
- DOE/NPOSR-CUW has no audit or appraisal system in place to ensure JEC compliance with DOE 5482.1B.
- The following concern was fully identified in DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not provided surveillance and oversight of the operating contractor's internal safety review system to ensure implementation according to the requirements of DOE 5482.1B.
OPERATING EXPERIENCE REVIEW

PERFORMANCE OBJECTIVE: Operating experiences should be evaluated, and appropriate actions should be undertaken to improve safety and reliability.

FINDINGS:
- Rigorous investigations of root causes of accidents and near-misses at NPR-3 are not performed. (See Concerns TS.4.1 and OS.4-1.)
- JBEC has not evaluated industry operating practices for safety and reliability implications.
- JBEC has not evaluated other DOE operating contractor experiences applicable to operations at NPR-3.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: There is no operating contractor program to gather, evaluate, and trend either their inhouse or industry-wide operating experience data to improve safety and reliability.

Worker Safety and Health (OSHA) Compliance

Overview
A comprehensive, Occupational Safety and Health Act (OSHA)-type safety and health appraisal covering general industry and construction standards was conducted at NPR-3 to determine compliance with existing OSHA regulations as adopted by DOE. Evaluation criteria were based, in part, on OSHA general industry and construction standards, 29 CFR 1910 and 29 CFR 1926, respectively. Noncompliance and hazards were documented and discussed with management at the end of each day. Repeated noncompliance of the same standard in a facility were only noted once on the inspection report form (see Appendix F). Figure 4-1 is a percentage break down of the identified noncompliances. All Performance Objectives for the worker safety technical area were evaluated except for WS.1 Management of Health and Safety Concerns, WS.2 Surveillance of Health and Safety Concerns, and WS.3 Compliance with Occupational Health Standards for General Industry. These sections are incorporated into Section 4.5.11 Occupational Safety.

The appraisal was directed at specific areas according to the number of employees working in the area, the presence of hazardous materials, the type and size of the activity in the area, and the size of the facility. Facilities satisfying these criteria include, but are not limited to, the maintenance shops, materials storage areas, process areas, drill sites, steam generators, and compressor stations. A less comprehensive sample of office buildings and other low-hazard areas was also inspected.

A total of 167 noncompliance issues were identified all of which were considered serious. The serious noncompliance issues may be misleading because the appraisal team expended most of its effort in identifying these types of hazards. Table 4-1 provides a summary of the areas that were inspected, the number of noncompliance issues noted, and the OSHA noncompliance classification of each. Figure 4-1 is a graphic portrayal of the noncompliance by major categories. Appendix F is a tabulation, by operational areas, of all identified noncompliance of OSHA standards and the classification of each. It should be noted that many of the noncompliances were corrected immediately after they were identified.

Collectively, the findings indicate serious noncompliance with electrical standards, the hazard communication program, machine guarding, labeling of hazardous chemicals, lockout/tagout procedures, confined space identification, confined space entry procedures, and emergency evacuation. Consequently, 2 of the 12 concerns noted during the appraisal involving electrical system deficiencies and lockout/tagout procedures were designated as Category II Concerns.

JBEC management is not fully complying with DOE regulations and Orders regarding safety and health requirements. This is evident by the lack of an effective, proactive compliance-oriented safety and health program. JBEC safety and health policies and procedures are informal, lack specificity, and are not uniformly distributed or enforced for all employees and subcontractors.

Numerous incipient policies and procedures were put in place to comply with safety and health standards; but, the programs were not carried out to satisfy
the intent, direction, and oversight required by the Secretary of Energy's "10-Point Initiative" in pursuit of excellence.

JBEC has fully identified 8 of the 12 concerns noted in this assessment and partially identified 1 concern (Excavations). The three concerns not identified involve storage of oxygen and acetylene, the storage of liquified petroleum gases, and improper eyewash facilities.

Line management and hourly employees should be knowledgeable in all safety and health programs and be able to recognize workplace hazards. Consequently, DOE/NPOS-CDW, and JBEC should develop and initiate an aggressive training program for all worksites in order to achieve compliance with DOE Orders and OSHA regulations.
4.5.10.2 Findings and Concerns

WS.4 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS FOR GENERAL INDUSTRY

PERFORMANCE OBJECTIVE: Workplaces should be free of uncontrolled physical hazards and should be in compliance with Department of Energy prescribed occupational safety standards.

NOTE: Noncompliance with this performance objective is documented utilizing the Occupational Safety and Health Act (OSHA) Form 1B format. A compilation of these completed forms are included as Appendix F to the Tiger Team Assessment report.

FINDINGS:

- On B-1-10, Gas Separator Bldg., standard railings and toeboards were not provided around a pressure relief valve, located 8 feet above the ground. The smooth, metal roof of the building was the working surface personnel used for the maintenance duties.

- Rungs on fixed ladders are not uniformly spaced to provide continuous ascent or descent. For example, the rungs of the fixed ladders in the Water Treatment Plant and B-1-3 were not uniformly spaced.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN:

-WS.4-1
-(H/C1)

FINDINGS:

- Anti-restart devices were not provided on machines where injury to the operator might result if the motors were to restart after a power failure.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN:

- Machine guarding is missing and/or deficient in several areas at NPR-3. Examples include:

  - There is incomplete guarding of power transmission devices such as belts and pulleys. For instance, the horizontal belts and pulleys on Pump 37 AX 10 and Well No. 16 S-35 and the vertical belts and pulleys on DOE Drilling Rig No. 2 diesel were not properly guarded.

  - Rotating drill press chucks on the Wilton drill press in the Maintenance Shop and the Milwaukee drill press in the LTS Gas Plant Shop were not guarded.

  - Fan guarding was not provided on the Pamco No. 2 air exchanger in the LTS Gas Plant.

  - In the Maintenance Shop, the horizontal shaft for the circulation pump and the compressor in the work bay were not completely guarded.

  - In the Maintenance Shop, the Rigid portable band saw did not have the unused portion of the blade guarded.

CONCERN:

- Oxygen and acetylene cylinders were not stored at least 20 feet apart or with a fire barrier of 30 minutes fire resistance rating at the Warehouse outside storage rack and in the LTS Gas Plant Shop.

CONCERN:


FINDINGS:

- The following concern was not identified in the JBEC self-assessment (April 1992).
CONCERN: Compressed gas cylinders are not stored by the operating contractor in accordance with 29 CFR 1910, Subpart Q, Welding, Cutting, and Brazing.

FINDINGS: • Electrical cords and battery jumper cables have cuts, broken insulation, and are frayed allowing for potential contact with energized wires.

• Testing instrumentation indicated that some electrical circuits had the ground and neutral leads shorted. Examples include: the B-1-3 Operator Shack circuit No. 2 and the Steam Generator No. 4 circuit No. 11.

• The B-1-3 Operator Shack circuit No. 1 had an open neutral.

• At the Warehouse Quonset copy room, an electrical circuit receptacle box cover was broken exposing the live parts inside.

• Electrical equipment not approved for Class I, Division 1 and 2 locations include wiring in the LTS Gas Plant Office Trailer, the LTS Cold Storage Building catalytic heater, the B-1-10 operator doghouse light switch, the B-1-3 operator doghouse lighting, and the Hazard Waste Accumulation Area shack lights and junction boxes.

• Numerous conduit fittings are not wrench tight in the following locations defined as Class I, Division 1 or 2: B-1-3 Water Shipping pump station and the South Terminal LACT shack light and power on/off switch conduit.

• See Concerns OS.2-1, OP.3-2, TC.4-1, and TC.10-1.

The following concern was fully identified in the J8EC self-assessment (April 1992).

• The operating contractor does not ensure their employees are trained in and uniformly comply with lockout/tagout procedures. Examples include:

  - Some tagout attachment means did not have a minimum unlocking strength of at least 50 pounds.
  - The tagout devices did not identify the employee applying the device.
  - Lockout devices intended for controlling energy were used for other purposes.

- Lockout devices were not standardized within the facility in at least one of the following criteria: color, shape, or size.

- J8EC does not conduct, at least annually, inspections of the energy control program.

- The lockout device keys were not under the exclusive control of the employee performing the servicing and/or maintenance.

• In 1992, an accident report indicated an electrician was shocked due to an improper lockout/tagout procedure.

• See Concerns OS.2-1, OP.3-2, TC.4-1, and TC.10-1.

• The following concern was fully identified in the J8EC self-assessment (April 1992).

CONCERN: The operating contractor does not comply with 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout) in that minimum performance requirements for the control of hazardous energy have not been established.

FINDINGS: • In the LTS Gas Plant, the propane and butane/gasoline storage tanks are not separated by a minimum distance of 20 feet.

• In the LTS Gas Plant, the propane and butane/gasoline storage tanks are diked together.

• In the LTS Gas Plant, no fusible link was provided at the discharge of the propane tanks for emergency shutdown.

• See Concerns FP.3-1 and FP.5-1.

• The following concern was not identified in the J8EC self-assessment (April 1992).

CONCERN: The operating contractor does not comply with 29 CFR 1910.110, Storage and Handling of Liquified Petroleum Gases.

FINDINGS: • J8EC has not conducted a risk analysis to determine confined spaces.

• J8EC has not identified all confined spaces. Examples include: the basement of the LTS Compressor Building, the entrances to the radiant areas of the steam generators, the B-1-10 box, and the inspection portals to all aboveground tanks such as the fire water and product water tanks at the North Waterflood area.

• J8EC has not properly labeled all confined spaces.
CONCERN: See Concern 05.2-2.

FINDINGS:
- JBEÇ does not provide adequate (i.e., at least a 15 minute continuous flush) eyewashes at all areas where required. Examples include: the North Waterflood area where Nalco 3919 is handled, the LTS Compressor Building, B-1-10 where Nalco 4818 and 4449 is used, and the Chemical Dock where multiple hazardous chemicals are handled.
- JBEÇ does not provide a first-aid trained employee at the NOSR-1 and NOSR-3 sites.
- See Concern TC.4-1.
- The following concern was not identified in the JBEÇ self-assessment (April 1992).
- JBEÇ has not developed or implemented a hazardous waste operations safety and health spill response procedure.
- JBEÇ has not provided training for all employees working onsite who may respond to hazardous substance spills, and for their supervisors and managers responsible for the site.
- See Section EP.3 and Concerns TC.1-3, TC.4-1, and TC.10-1.
- The following concern was fully identified in the JBEÇ self-assessment (April 1992).

CONCERN: The operating contractor does not comply with 29 CFR 1910.151, Medical Services and First-Aid.

FINDINGS:
- At the Well No. 16-5-35 excavation, adequate barrier physical protection was not provided.
- JBEÇ has not ensured that excavations are properly sloped or benched to prevent cave in including the excavation at Well No. 16-5-35 where work was being performed.
- JBEÇ has not provided a competent person, as defined by OSHA, to inspect excavations prior to the start of work and as needed throughout the shift.
- See Concerns TC.1-3, TC.1-4, TC.4-1, TC.10-1 and OP.5-1.
- The following concern was not identified in the JBEÇ self-assessment (April 1992).
- The operating contractor does not comply with 29 CFR 1926, Subpart P, Excavations.

FINDINGS:
- JBEÇ has not designated a competent person, as defined by OSHA, to inspect all machinery and equipment prior to and during each use.
- DOE Drilling Rig No. 2 has many deficiencies including the following:
  - Many wire ropes and cables are "bird-caged" and have kinks, broken strands, splits, and flattened strands.
  - Horizontal shafts on the right angle rotary and the drop box are not guarded.
  - Derrick climber counterbalanced pulleys were worn and not replaced.
  - The muffler on the diesel was not insulated or guarded to protect employees from possible contact.
  - The belts and pulleys on the diesel were not guarded.
- Cable clevises on the derrick are improperly sized for their intended use.

- See Concerns OP.5-1, TC.1-3, TC.1-4, TC.4-1, TC.10-1, and MA.2.2.

- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not comply with 29 CFR 1926.550, Cranes and Derricks.

PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of chemical, physical, and biological stresses that may be encountered in their work environment.

NOTE: Noncompliance with this performance objective is documented utilizing the Occupational Safety and Health Act (OSHA) Form 18 format. A compilation of these completed forms is included as Appendix F to the Tiger Team Assessment report.

FINDINGS:

- Hazardous chemical containers were incorrectly labeled in many areas. Examples and locations include: the butane/gas storage tanks at the LTS Gas Plant and Solvent 140 in the B-TP-10 operator doghouse.

- Material Safety Data Sheets were not available in a reasonable time at Steam Generator No. 1, the Hazard Waste Accumulation Area, and the Chemical Dock.

- There is no written Hazard Communication Program specific for each worksite at NPR-3, NOSR-1, and NOSR-3.

- The JBEC Chemical Hazard Communication Program Procedure does not address the following major program elements:
  - Labels and other forms of warning: such as the designation of person(s) responsible for ensuring labeling of in-plant containers, description of labeling systems in use at NPOSRCUW, description of written alternatives to labeling of in-plant containers, and procedures to review and update label information when necessary.
  - Material Safety Data Sheets (MSDS): such as the designation of person(s) responsible for obtaining/maintaining the MSDS, how such sheets are to be maintained, and procedures to follow when the MSDS is not received at the time of the shipment.
  - Training: such as the designation of person(s) responsible for conducting training, format of the program to be used, elements of the training program, procedures to train new employees at the time of their initial assignment and to train employees when a new hazard is introduced into the workplace, and procedures to train employees for new hazards they may be exposed to when working on or near another employer's worksite (such as NOSR-1 and NOSR-3).

- See Section OS.5 and Concern TC.1-4.

- The following concern was fully identified in the JBEC self-assessment (April 1992).
CONCERN: The operating contractor does not comply with the requirements of 29 CFR 1910.1200, Hazard Communication.

4.5.11 Occupational Safety

4.5.11.1 Overview

All five Occupational Safety performance objectives were addressed in this appraisal. The appraisal was conducted through a combination of NPR-3 site walkthroughs, equipment and facility assessments, work practice evaluations, personnel interviews, policy and procedure reviews, and records and documentation reviews. Walkthroughs were conducted of most NPR-3 facilities including the tank batteries, test stations, production areas, steamflood facilities, waterflood facilities, shops, warehouse, safety and health facility, chemical dock, and the LTS Gas Plant. Various operations were either observed or discussed with workers. Policies, procedures, programs, records, work permits, and other documentation were reviewed at the site and in JBEC offices. Discussions and interviews were conducted with JBEC representatives from the various line organizations, Safety and Health Section, Environmental Section, subcontracts organization, and other groups. Interviews were also conducted with DOE/NPOSR-CUW personnel responsible for environment, safety, and health.

A line management safety program is in place at NPR-3. Systems have been implemented to apply a safety and health program, including inspections, deficiency reporting and tracking, safety meetings, permit processes, and others. In general, the JBEC line organization demonstrates interest and emphasis on safety and has been successful in identifying and correcting many safety deficiencies. Nevertheless, safety deficiencies remain which have not been identified and corrected, particularly in the area of electrical safety.

In many respects, JBEC takes an informal approach to the implementation and application of safety and health requirements. Although informal, the approach often demonstrates some degree of effectiveness. One example is safety and health training. Much of the training provided takes the form of informal briefings in the field or during safety meetings. Yet, in many cases, workers demonstrated knowledge in the application of safe work practices and were aware of hazards associated with their activities. But notable exceptions existed where it was apparent that workers required additional information and training to avoid unsafe practices and conditions. A second example is the lack of operating procedures with safety requirements. Despite the lack of many formal procedures, safety issues are generally considered and applied by the workers.

In some instances the informal approach has failed to achieve the desired result, and workers are placed at risk. As examples, JBEC has been ineffective in assessing and properly controlling the hydrogen sulfide hazard, in controlling confined space entries, and in controlling hazardous energy through a lockout/tagout program. The confined space deficiency is a Category II Concern.

The Safety and Health Section is staffed with three well qualified individuals; the Section Manager, a Safety and Health Professional, and a Training Specialist. In addition to occupational safety and health responsibility, the Section also has responsibility for the Emergency Preparedness Program, the Fire Protection Program, and Medical Program. Supplemental resources are not available through a subcontract mechanism to assist in addressing all areas of responsibility. The Section has not...
formally set its priorities, and it has not determined which operations and associated hazards require its specific involvement, oversight, and support.

Hazard identification, evaluation, and control is a significant deficiency at NPR-3. The evaluation and response to the hydrogen sulfide hazard is one example. A hazard evaluation has not been conducted despite hydrogen sulfide in tanks and vessels well in excess of that immediately dangerous to life and health. Control criteria have not been established. JBEC policies and procedures concerning restricted areas and personal protection are inconsistent. All areas with potential sources of high hydrogen sulfide have not been identified. Despite the formation of a project team to address this issue, the effort lacks coordination, planning and approaches, objectives, and a basis for decisions. Other hazardous conditions which lack thorough evaluation and/or proper controls include electrical safety, control of hazardous energy sources, confined space entry, chemical handling, benzene exposures, and lead exposures. The lack of hazard identification, evaluation, and control is a Category II Concern.

Although OSHA-type inspections are performed, the DOE/NPOS-CW Site Office does not provide support, guidance, direction, and oversight to JBEC for its safety and health program. The Site Office has not delineated its safety and health expectations and has not provided JBEC with direction or assistance concerning DOE Orders applicable to safety and health.

The JBEC self-assessment was thorough. JBEC at least partially identified all occupational safety concerns. DOE/NPOS-CW identified the one occupational safety concern directed toward the Site Office.

4.5.11 Findings and Concerns

05.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation and control of the occupational safety program.

FINDINGS:
• The JBEC Safety and Health Section has one Safety and Health Professional supporting field activities, one Training Coordinator, and a Section Manager. One additional Safety Professional is on temporary assignment through September 1992. This staff not only conducts safety and health oversight, support, and training, but is also responsible for fire protection, emergency preparedness, and medical services. The Section's functions are limited by personnel resources.
• No contractual mechanism is in place to obtain safety and health subcontractor support as needed.
• The Safety and Health Section has not established a staffing plan around goals, objectives, roles, and responsibilities. (See Concern OA.6-2)
• The Safety and Health Section has not prioritized its functions. It has not conducted sufficient hazard analyses or job safety analyses to determine which types of activities require more intense support or oversight. It is not necessarily involved in higher hazard operations, such as confined space entry.
• The Safety and Health Section does not periodically conduct audits or appraisals of safety and health program elements, such as lockout/tagout, chemical handling, confined space entry, and others.
• The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN:
(The operating contractor Safety and Health Section does not provide all necessary support and oversight to the line organization for the implementation of the Occupational Safety and Health Program as required by DOE 5480.1B and DOE 5480.10.)

FINDINGS:
• The DOE/NPOS-CW Director of Contracts Surveillance and Administration has safety and health as a collateral duty. The Director's safety and health role and function are ill-defined. Guidance, direction, and oversight is not provided to any significant extent for the JBEC safety and health program. (See Concerns OA.1-2, OA.1-5, and OA.1-6.)
• The DOE/NPOSR-CUW Environmental Specialist conducts safety and health OSHA-type inspections and provides information to the Director of Contracts Surveillance and Administration for award fee evaluation purposes. However, the organizational interfaces, reporting mechanisms, and responsibilities between the Environmental Specialist and Director are not clearly established.

• DOE/NPOSR-CUW does not provide regular safety and health oversight of NOSR-1 and NOSR-3 sites.

• DOE/NPOSR-CUW does not provide any safety and health program appraisals or assessments.

• DOE/NPOSR-CUW does not provide constructive and supportive guidance to JBEC for the improvement of the safety and health program or for the implementation of the safety and health requirements of DOE Orders. (See Concern OA.1-2.)

• DOE/NPOSR-CUW does not provide JBEC with clear safety and health expectations to guide JBEC in the establishment of priorities, objectives, and goals.

• The following concern was identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office does not provide support, guidance, and direction to the operating contractor regarding the Occupational Safety and Health Program as required by DOE 5480.1B.

OS.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support for the occupational safety program.

FINDINGS:

• Few JBEC Operation Procedures are in place to define operating requirements and specify associated safe work practices. (See Concern OP.3-1.)

• Section 1.3 of the JBEC Policy and Procedure Manual provides safety and health policies, procedures, and programs. Many of these Policy and Procedure documents have been recently prepared or revised and have not yet been fully implemented. Examples include: Lock, Tag, and Try Procedure; Hearing Conservation Program; In-House Training; Subcontractor Safety Monitoring; and Industrial Hygiene; and Safety Awards, among others.

• JBEC Policy and Procedure Number 1.3-27, "Lock, Tag, and Try Procedure," defines the JBEC lockout/tagout program. The procedure does not address all aspects of 29 CFR 1910.147. For instance, the procedure does not specify lock/key control, means to verify isolation, and annual audits to evaluate program effectiveness. (See Concern WS.4-6.)

• JBEC Policy and Procedure 1.3-27 specifies that locks shall be standardized. This requirement is not yet in place.

• Locks and keys are not well controlled. They are not always kept in the possession of the employee performing the service and maintenance. Often, locks and keys are kept unsecured on a wall mounted station.

• Logs of lockouts are not maintained as required by DOE 5480.19 to ensure operational status control. (See Concern OP.3-2.)

• Verification that energy sources have been isolated by the lockout/tagout process is not always performed. A standard procedure for verification is not in place.

• JBEC Policy and Procedure Number 1.3-36, "Hearing Conservation Program," requires that each field job classification be monitored for 8-hour time weighted average exposure to noise. Noise monitoring was performed in 1990, and some follow-up monitoring has since been conducted. The monitoring approach and data analysis, however, were not conducted in a manner to identify which workers or job classifications should be enrolled into a hearing conservation program.

• Audiograms have been provided as part of the Hearing Conservation Program to approximately 40 workers. However, the determination as to who receives audiograms was not fully based on measured or predicted exposures to noise at or above the 85
CONCERN:,(05.2-1)
(HI/CI)
decibel (dBA) standard. Workers with comparable duties may or
may not be given audiograms.

- The Hearing Conservation Program and JBEC practices are not in
full compliance with 29 CFR 1910.95. (See Concern MS.1-1.)

- See Concerns OS.2-2, WS.4-6, WS.6-1 and OA.1-2.

- The following concern was fully identified in the JBEC self-

The operating contractor occupational safety and health program as
defined in the Policy and Procedure Manual is not fully
implemented, and various program elements are not in compliance
with DOE 5480.4 and Occupational Safety and Health Administration
standards.

FINDINGS:

- JBEC Policy and Procedure Number 1.3-26, "Hot and Cold Work
Permits," dated 1988, includes requirements for confined space
entry. This procedure is not consistent with many aspects of
Draft 29 CFR 1910.146 and ANSI Z117.1-1989. Examples include:
hazard definitions, rescue provisions, and training
requirements, among others.

- A revised Work Permit Policy and Procedure was adopted during
this assessment on June 26, 1992. It contains little
information on confined space entry, but references a
"Procedure for Safe Work Permitting," dated April 1990. This
1990 procedure is a training aide. It also does not address
all necessary aspects of the standards cited above.

- Rescue provisions are not clear in Policy and Procedure 1.3-26 and
in the "Procedures for Safe Work Permitting." The
procedures correctly state that the attendant is to perform
rescue functions from outside the space, but also discuss
rescuers entering the space, without identifying who the
rescuers will be. The procedure does not state whether an in-
house rescue team or outside rescue team will be used.
Training in confined space rescue has not been provided to in-
house personnel, as required by the standard.

- Attendants and entrants receive only 2 hours of in-house
confined space entry training. There is no distinction between
the training provided to attendants and entrants.

- Persons authorizing entry who are responsible for identifying and
controlling hazards, specifying permit conditions, and
issuing the permit are provided only a minimal 2-4-hour in-
house training course. JBEC considers that the attendance of
this course qualifies the individual to authorize entry;
however, this degree of training cannot ensure that the persons
authorizing entry are qualified in hazard identification and control.

- The Safety and Health Section is not required to participate in
the process of hazard identification and control, permit
issuance, verification that controls are in place, or any other
aspect of confined space entries.

- JBEC personnel authorizing entry are not necessarily familiar
with the activities, facilities, or operations where the entry
will occur. This is particularly true when the person
authorizing entry does not work in the operation or facility
where entry is to be conducted. Persons authorizing entry are
not comfortable with this situation.

- Confined space entry permits are completed for entries. All
required information is not always provided on the permit, such
as the names of all authorized entrants and attendants, rescue
provisions, and monitoring requirements.

- Confined spaces are not always labelled. In addition, those
that are labelled are not properly labelled with a red and
black danger sign indicating, confined space, enter by permit
only.

- Hazards associated with various types of confined spaces and
entries have not been identified.

- All confined spaces have not been identified and are not always
recognized as confined spaces. As an example, the lower level
of the LTS Gas Plant Compressor Building is under a grating and
has limited access points. Gas pipelines are located in the
space and the potential for gas accumulation, explosion, and
fire exists. The space was not considered a confined space.
Workers enter to turn valves to drain liquid hydrocarbons from
lines.

- The following concern was partially identified in the JBEC

CONCERN: (OS.2-2)
CAT. II
OS.3 MANAGEMENT OF SAFETY CONCERNS

PERFORMANCE OBJECTIVE: Physical and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

FINDINGS:

- A documented program has not been established to identify, evaluate, and control occupational safety and health concerns.
- Job safety analyses have not been conducted for many operations.
- Although an industrial hygiene consultant conducted a study in 1990, followup industrial hygiene surveys and monitoring programs have not been conducted to effectively evaluate and control hazards associated with many operations, such as chemical hazards during well treating, benzene exposures from produced crude oil and gas, and others. (See Concern OS.4-2.)
- The Safety and Health Section has not identified and prioritized activities and operations that have associated hazards requiring its involvement, oversight, or support. (See Concern OS.1-1.)
- The hydrogen sulfide hazard has not been evaluated, and controls are not established based on a hazard analysis. A plan for a hazard analysis has not been developed. (See Concern OS.3-2.)
- Confined space hazards have not been identified. (See Concern OS.2-2.)
- Many operations and activities posing electrical, chemical, and physical hazards are conducted by employees working alone in remote areas. An evaluation has not been conducted of operations and activities where employees work alone to determine the degree of risk. A working alone policy, location tracking system, and formal communication requirements have not been developed based on risk.
- Eye and skin hazards from chemical splashes are present during various operations and activities at NPR-3, including the preparation and handling of significant quantities of organic solvents, phenols, acids, spontaneously ignitable hydroxides, and others. There is a general lack of eyewash stations and showers located where these materials are handled and with sufficient capacity to effectively flush the eye or skin. The chemical dock area and well treatment activities in the field pose particular hazards, although other areas and activities suffer from a similar deficiency. JBEF has failed to implement a solution to address the eyewash and shower deficiency and to ensure the ability to treat an acute eye or skin injury (See Concern WS.4-8.)
- Electrical safety hazards have not been evaluated and personal protective equipment has not been specified and provided. (See Concerns WA.3-1 and WS.4-5.)
- Mandatory audits, such as for lockout/tagout to assess program effectiveness and proper hazard controls, are not conducted.
- See Concerns TS.2-1 and FP.3-1.
- The following concern was fully identified in the JBEF self-assessment (April 1992).

CONCERN: The operating contractor has not identified, evaluated, and controlled many occupational safety and health hazards as required by DOE 5480.4, DOE 5480.10, and Occupational Safety and Health Administration standards.

FINDINGS:

- Hydrogen sulfide is produced as a result of the steamflood and, to a lesser extent, waterflood operations. JBEF recently formed a project planning team to evaluate and control the hydrogen sulfide production and emissions. However, the project team has not effectively planned and conducted the hazard assessment and control process.
- Although environment, safety and health, engineering, and production are represented on the project planning team, a coordinated approach to the hydrogen sulfide hazard has not been established.
- A hazard analysis for hydrogen sulfide has not been performed. A monitoring plan on which to base a hazard analysis has not been established.
- Restricted zones have been established at 200-foot perimeters surrounding 3 facilities (i.e., 2 test stations and 1 tank battery) associated with the steamflood project. The 200-foot distance was arbitrarily established. The adequacy of this zone has not been evaluated based on a hazard analysis supported by monitoring data.
- An evaluation has not been conducted to determine whether other areas should also be restricted. Other areas impacted by the steamflood project, such as the production areas which receive produced oil and water from steamflood wells, show similar levels of hydrogen sulfide in tanks and skin boxes as the areas which are considered to be restricted zones. However, these areas are not under the same requirements as the restricted zones.
- Production area B-1-10 had been considered free from hydrogen sulfide even though it received oil and water produced from steamflood wells and even though another production area (i.e., B-1-3) was known to have high levels of hydrogen sulfide in the tanks. Sampling prompted by the SAM Subteam revealed hydrogen
Sulfide levels over 1,000 parts per million (ppm) in the oil tank.

- Sampling for environmental purposes is conducted monthly at the 200-foot perimeter surrounding the three test/tank battery areas where hydrogen sulfide emissions are suspected. These data have not been used to evaluate the positioning of the restricted zone or to make judgments concerning worker protection and hazard controls.

- Little, if any, exposure monitoring for workers is conducted within the 200-foot boundary where exposures would be expected to be higher than at the perimeter. Monitoring has not been conducted to evaluate exposures relative to the OSHA permissible exposure limit or to the concentration immediately dangerous to life or health (IDLH).

- Occupied areas within the restricted zones have the potential to accumulate hydrogen sulfide due to adjacent emissions and restricted airflow. These areas include, among others, fabricated buildings housing pumps near heaters and tanks, pits collecting tank runoff, diked areas, depressions, and other buildings. These areas have not been evaluated for their potential to accumulate hydrogen sulfide.

- Contrary to JBEC policy and procedure, workers do not place monitors at arms length to determine whether hazardous levels of hydrogen sulfide are present before entering these areas.

- In the 3 restricted areas, workers are required to wear hydrogen sulfide alarm monitors to alert them if they have entered an area above 10 ppm, in which case they would retreat. However, due to the response time of these alarms, sufficient warning would not be provided to prevent them from entering an IDLH area, and to ensure their ability to escape in time.

- JBEC has not established hydrogen sulfide criteria (e.g., concentration in tanks, in ambient air, in air around tanks and other emission sources) on which to base decisions regarding exposure controls or area restrictions.

- Requirements for respiratory protection to access the tops of oil and water tanks are inconsistent. For instance, at production area B-1-3, hydrogen sulfide concentrations in water and oil tanks are approximately the same, with both regularly exceeding 1,000 ppm. The use of a supplied air respirator is required to access the top of the water tank, but is not required for the oil tank.

- Warning sign requirements for access to the tops of tanks are arbitrary and are not based on a hazard analysis. Some tanks have no warning signs; others are posted as requiring an alarm monitor; others require both a monitor and supplied air respirator.

The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor has not evaluated and controlled the hydrogen sulfide hazard associated with the steamflood project as required by DOE 5480.10.
SURVEILLANCE OF SAFETY CONCERNS

PERFORMANCE OBJECTIVE: Appropriate surveillance of activities should be conducted to measure safety performance and ensure the continued effectiveness of controls.

FINDINGS:
- Accidents and injuries are recorded and investigated, but are not evaluated for root cause.
- NPR-3 has not implemented and maintained a hazard prevention program which addresses physical hazards identifiable from the current OSHA 200-logs and JBEC Report of Injury/Illness/Near Miss. There is no evidence that recurrent hazards have been addressed with a sitewide accident prevention program.
- Accidents and injuries are not trended.
- See Concerns TS.4-1 and FR.6-1.

CONCERN:
(OS.4-1) (HI/CI)

FINDINGS:
- Processes and responsibilities for subcontractor safety surveillance have not been established by the operating contractor as required by DOE 5480.9.
- The line organizations apply a series of safety checklists to conduct monthly or periodic workplace inspections to identify safety deficiencies. These inspections focus on facility and equipment condition. Comparable reviews are not conducted to evaluate the effectiveness of safety and health program elements.

CONCERN:
The operating contractor does not record, trend, or evaluate accidents and injuries for root cause as required by DOE 5483.1A, DOE 5484.1, and 29 CFR 1904.

FINDINGS:
- Oversight responsibility for subcontractors is not clearly defined.

CONCERN:
(OS.4-2) (HI/CJ)

FINDINGS:
- An industrial hygiene survey of selected activities was conducted by a subcontractor in 1990, and some followup monitoring is performed by the JBEC Safety and Health Section. However, hazard analyses and exposure monitoring have not been conducted in a manner to fully determine the degree of hazard and necessity for controls for many items, including the following as examples:
  - naturally occurring radioactive materials deposited in pipelines, valves, and other equipment;
  - benzene from crude oil and gas production and processing;
  - chemicals used in well treatment such as isobutanol, ethylbenzene, xylene, dimethylformamide, and meronidazone (a suspect carcinogen);
  - noise (some monitoring is performed, but not in a manner to determine workers with exposures above 85 dBA for enrollment in the hearing conservation program);
  - hydrogen sulfide (see Concern OS.3-2); and
  - lead during spray painting operations.

- The Safety and Health Section does not identify and routinely perform safety and health surveillance for activities that are deemed to pose higher levels of risk to employees, such as confined space entries, chemical handling, and use of spontaneously ignitable materials (e.g., hydrosulfites and iron sponges).
CONCERN:

See Concerns OS.1-1 and OS.3-1.

The following concern was partially identified in the JBECC self-assessment (April 1992).

CONCERN: (05.4-3) The operating contractor does not conduct an effective surveillance and exposure monitoring program to ensure effective control of safety and health hazards as required by DOE 5480.10 and DOE 5480.1B.

OS.5 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of physical stresses that may be encountered in their work environment.

FINDINGS:

• Safety meetings are held on a weekly basis by line organizations. The Safety and Health Section does not provide any significant input to these meetings to ensure that appropriate topics are addressed.

• The safety meetings are considered by the line organizations to constitute OSHA compliance-oriented training in certain safety topics. However, any training conducted in these meetings is generally informal, of short duration, and not conducted in a manner to fulfill training requirements of OSHA standards.

• Confined space entry training is of short duration and cannot ensure that trainees are qualified to perform their function. (See Concerns OS.2-2 and TC.4-1.)

• Hazard communication training is of short duration and is generic. Well treatment personnel handling significant quantities of a wide variety of chemicals have been informally briefed on Material Safety Data Sheets, but have not received hazard communication training specific to their operations. (See Concern WS.6-1.)

• Competent person training has not been provided as required by various OSHA standards.

• Qualifications of operators are not verified, and certification training is not provided for heavy equipment and crane operators.

CONCERN: See Concerns TC.1-1 and TC.4-1.
4.5.12 Fire Protection

4.5.12.1 Overview

The fire protection appraisal addressed six of the seven performance objectives identified in DOE/DE-0135 “Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites,” dated June 1990. Performance Objective PP-4 Impairment of Operations was not appraised as the site would not be vulnerable to being shut down for an unacceptable period as the result of a credible fire. The S&H Subteam appraisal addressed the technical adequacy and overall effectiveness of the site Fire Protection Program in meeting the six performance objectives. The appraisal was performed by conducting inspections of selected buildings, maintenance shops, tank storage facilities, the LTS Gas Plant, steam generator buildings, test treaters, and Crude Tank Battery installations. It also included interviews with site personnel responsible for the fire protection program, Supervisors, technicians, craft personnel, members of the newly formed Emergency Response Team (ERT), and managers throughout the site. A review of training records and fire equipment inspection checklist was also conducted.

The information developed from these interviews, inspections, and of document reviews was evaluated against provisions of DOE 5480.4, DOE 5480.7, DOE 6430.1A, and the DOE Fire Resource Manual; the National Fire Protection Association (NFPA) Standards, specifically NFPA 101 “Life Safety Code,” NFPA Standard 1500 Fire Department Occupational Safety & Health, and NFPA 30 Flammable and Combustible Liquids Code; Standards of the Highly Protected Risk Insurance Industry; and fire protection standards associated with the petroleum industry.

Overall responsibility for the NPOSR-CUW Fire Protection Program is assigned to the Director of DOE/NPOSR-CUW in accordance with DOE 5480.7. Organizational responsibility is assigned to the DOE Director of Contract Surveillance and Administration. Operational responsibility for the Fire Protection Program is assigned to the JBEC S&H Manager.

The Improved Risk/Highly Protected Risk levels of fire protection as defined by the major insurance underwriters and requirements as defined in DOE Orders and the DOE Fire Resource Manual have not been established at the DOE/NPOSR-CUW facilities.

The scope of the NPOSR-CUW Fire Protection Program only covers maintenance, annual testing and inspection of portable fire extinguishers. JBEC uses a certified Wyoming subcontractor to perform the required maintenance and testing of the portable fire extinguishers on an annual basis. Limited training of JBEC employees on the use of fire extinguishers is performed by a training specialist assigned to the Safety and Health Section and is conducted on a yearly basis.

There is no fire department organization or fire brigade at NPR-3, NOSR-1, or NOSR-3. Fire fighting protection for NOSR-1 is furnished by the Bureau of Land Management (BLM). Fire fighting protection for NOSR-3 is furnished by the Rifle and Parachute Volunteer Fire Departments. Fire fighting protection for NPR-3 is furnished by the Midwest and Edgerton Volunteer Fire Departments and the Natrona County Fire Department, which is located near Casper.

Response time for the Midwest and Edgerton Fire Departments to the site is 15-20 minutes, and for the Natrona County Fire Department, the response time 40-50 minutes. Fire fighting equipment used by the three fire departments responsible for fire fighting activities at NPR-3 meets minimum NFPA Standards for fighting fires involving petroleum and petroleum products.

The newly created Emergency Response Team (ERT) has not been formalized; has not been outfitted properly with Personal Protective Equipment (PPE) such as bunker suits, SCBAs, and fire helmets; and has not received sufficient training in the many disciplines needed to make a group such as this proficient. The enthusiasm displayed by the members of this team and witnessed during this appraisal would indicate this group could provide a high level of emergency related services to the site until further assistance is available, provided they are well equipped and trained.

There are no fixed or automatic fire extinguishing systems installed at any of the NPOSR-CUW facilities. There are no dedicated fire water systems which includes fire mains, fire hydrants, fire pumps, or sufficient water storage for fire fighting at any of the NPOSR-CUW facilities. At NPR-3, there is a warehouse in operation that contains highly flammable insulation; within the warehouse, a Mezzanine Office was installed over the Supervisor’s office, constructed of wood material. This situation results in a higher than normal fire hazard. Also, in the NPR-3 Maintenance Shop a hot oil truck is occasionally stored that contains 75 barrels of hot crude oil and two, 500 gallon propane tanks. There are no fixed fire extinguishing systems in either of these buildings. The propane and butane/gasoline tanks located at the LTS Gas Plant have no fixed deluge sprinkler systems or fixed fire monitor protection. This failure to protect facilities against high value property losses was identified as a Category II Concern.

DOE/NPOSR-CUW and JBEC personnel do not clearly understand their authorities, accountabilities, or interfaces with supporting groups in relation to fire protection activities.

Responsibilities for implementation and execution of the Fire Protection Program have not been effectively communicated to responsible managers, supervisors and hourly employees, and they do not understand their fire protection responsibilities.

No Safety Analysis Reports (SARs), Fire Hazard Analysis, or similar documents have been prepared which evaluate the potential release of hazardous materials beyond the site/facility boundaries as a result of a fire at NPR-3. Although reviews are made of any new construction or modification to existing facilities for fire protection features, there is no formal program in place to assure compliance with the standards of the NFPA 101, “Life Safety Code.”

There is no Fire Barrier Program in place to control liquid run-off as a result of spills or fire fighting activity. Fire protection engineering surveys are not conducted as required by DOE 5480.7. Vital record storage and personnel medical records storage facilities do not meet current fire protection standards.

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The JBEC self-assessment was considered to be thorough and candid. JBEC addressed all of the concerns in their self-assessment. The DOE/NPOSR self-assessment noted all of the performance objectives in their self-assessment. However, the self-assessment did not address all of the concerns in depth.

In order for DOE/NPOSR-CUW to meet and to achieve DOE requirements for fire protection, a strong management culture that clearly defines the Fire Protection Program, organization, responsibilities, accountabilities, training, resource allocations, and interfaces with supporting groups needs to be established.

4.5.12.2 Findings and Concerns

FP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Fire protection organization and administration should ensure the effective implementation and control of the fire protection equipment and activities.

FINDINGS:

- There is no policy established for the overall Fire Protection Program by either DOE/NPOSR-CUW or JBEC.
- Sufficient resources have not been allocated to accomplish a Fire Protection Program as required by DOE 5480.7.
- The fire protection organizational structure is not well defined or understood.
- There are no Fire Protection Program implementation procedures in place.
- Responsibilities and authority of each management, supervisor, and professional position within the fire protection organization are not defined.
- Personnel do not clearly understand their authority, responsibilities, accountabilities and interfaces with supporting groups.
- Site/facility fire protection standards have not been established and incorporated in the plans and specifications for all new buildings and major modifications of existing buildings as required by DOE 6430.1A.
- The following concern was fully identified in the JBEC self-assessment (April 1992).
- The operating contractor has not developed a Fire Protection Program as required by DOE 5480.7, DOE 6430.1A, and the DOE Fire Resource Manual.

CONCERN: DOE/NPOSR-CUW has not established organizational responsibility to provide guidance or oversight for a Fire Protection Program.

FINDINGS:

- DOE/NPOSR-CUW has not established organizational responsibility to provide guidance or oversight for a Fire Protection Program.
- See Concern OA.1-2.
- The following concern was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

CONCERN: DOE/NPOSR-CUW Site Office has not provided guidance to the operating contractor on resources, organization, and administrative systems necessary for the effective implementation and control of the Fire Protection Program as required by DOE 5480.7, DOE 6430.1A, and DOE Fire Resource Manual.
FP.2 LIFE PROTECTION

PERFORMANCE OBJECTIVE: All facilities onsite should provide adequate life safety provisions against the effects of fire.

FINDINGS:

• There is no program in place to ensure that facilities comply with NFPA 101, "Life Safety Code" requirements. Examples include:
  - There is breaching of the ceiling in Mechanical Room of the Operations Office Building.
  - Some exit doors at the Safety Building do not open in way of exit travel.
  - There is no emergency exit for the upstairs office of the warehouse.

• The newly created ERT has not received sufficient training in their emergency duties, do not have personal protective equipment available, and are not formally organized as a fire fighting unit. Examples include:
  - Prefire plans have not been developed.
  - ERT members have not been fully trained in search and rescue operations. (See Concerns EP.3-1 and EP.4-1.)
  - There are no formal training or drill schedules developed.
  - A documented program does not exist requiring ERT members to tour their respective facility or site a minimum of once each quarter.

• The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor is not in full compliance with the National Fire Protection Association Standard 101, "Life Safety Code."

FINDINGS:

• DOE/NPOS-CUW has no program in place to ensure that facilities comply with NFPA 101, "Life Safety Code" requirements. Examples include:
  - JBEC offices located at the Cottonwood Office Building has a partial Fire Detection System and is not protected by an automatic sprinkler system; personnel in some offices can not hear the evacuation alarm signal when it is activated; and not all areas have fire extinguishers available.
  - DOE occupied offices at the Cottonwood Office Building has no fire detection system or an automatic sprinkler system; not all areas have fire extinguishers.

- The Energy I Building does not have an automatic sprinkler system and only has fire detectors installed in the large, first floor, Assembly Room.

• The following concern was fully identified in the DOE/NPOS-CUW self-assessment (April 1992).

CONCERN: DOE/NPOS-CUW Site Office is not in full compliance with the National Fire Protection Association Standard 101, "Life Safety Code."
FP.3 PUBLIC PROTECTION

PERFORMANCE OBJECTIVE: All facilities onsite should provide adequate protection to prevent any added threat to the public as the result of an onsite fire causing the release of hazardous materials beyond the site or facility boundary.

FINDINGS:
• SARs which contain fire hazard analysis information for evaluating the potential release of hazardous materials beyond the site or facility boundary have not been developed.
• A fire or explosion in one of the bullet tanks located near the LTS Gas Plant would place the public at risk due to the proximity of the tanks to a public access road. (See NPR-3 Loss Prevention Report dated April 10, 1992, prepared by JBEC Houston.)
• There are no automatic or fixed fire protection systems installed at NPR-3.
• There is no documented Fire Barrier Program in place to control release of liquid and hazardous materials to the public during a fire.
• This concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor has not established a Fire Barrier Program for controlling hazardous materials releases to the public from a credible fire according to the requirements of DOE 5480.7.

FP.5 PROPERTY PROTECTION

PERFORMANCE OBJECTIVE: A maximum credible fire, as defined in DOE 5480.7, Section 6.f., should not result in an unacceptable property loss.

FINDINGS:
• The improved Risk/Highly Protected Risk levels of Fire Protection as defined by the major insurance underwriters and requirements as defined in DOE Orders and the DOE Fire Resource Manual have not been established by DOE/NPOSR-CUW.
• There are no fixed or automatic fire extinguishing systems in service at NPR-3.
• There is a warehouse at NPR-3 that is insulated with a highly flammable insulation, has a wooden constructed office with two floors, and has no fixed fire protection system in place. (See NPR-3 Loss Prevention Report, dated April 10, 1992, prepared by JBEC Houston.)
• There is no dedicated fire water system in service at NPR-3. For example there are no fire mains, no fire hydrants, and no fire hose reels; only a limited amount of water is stored at a remote location from most of the buildings; and there are no fire pumps.
• DOE/NPOSR-CUW operates a South Terminal/LACT facility at NPR-3 without fire fighting foam protection for either the crude oil tank or bad oil tank.
• DOE/NPOSR-CUW operates crude oil tank batteries at NPR-3 without fire fighting foam protection for the crude oil tanks.
• The Maintenance Shop at NPR-3 occasionally stores a Hot Oil truck that may contain 75 barrels of hot crude oil and two 500 gallon propane tanks and is not protected by a fixed fire protection system. (See NPR-3 Loss Prevention Report, dated April 10, 1992, prepared by JBEC Houston.)
• The Liquified Petroleum Gas (LPG) and butane/gasoline tanks located at the LTS Gas Plant have no fixed deluge sprinkler systems or fixed fire monitor protection installed. Spacing and diking of these tanks do not meet the requirements of 29 CFR 1910.110. (See Concern WS.4.7 and NPR-3 Loss Prevention Report, dated April 10, 1992, prepared by JBEC Houston.)
• JBEC has not provided assurance that fire losses will not exceed the guidelines of DOE 5480.7.
• This concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not protect Naval Petroleum Reserve Number 3 facilities against property losses in excess of guidelines of DOE 5480.7 for a maximum credible fire.
PERFORMANCE OBJECTIVE: The Fire Department should have the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner.

FINDINGS:

- There is no organized full-time fire department or fire brigade on any of the NPOS R-CUW sites. A corrective action plan has not been developed to achieve compliance with NFPA Standard 1500 for fire department operations.

- Fire fighting protection for NPR-3 is furnished by the Midwest and Edgerton Volunteer Fire Departments and the Natrona County Fire Department, which are 20 and 50 minutes away, respectively.

- Fire Protection for NOSR-1 is furnished by the BLM which is 30 miles away from the site and for NOSR-3 by the Rifle and Parachute Volunteer Fire Departments, each of which are 10 miles away from these sites.

- Quarterly visits and orientation to the sites by local fire department members as required by DOE 5480.7 and NFPA 1500 are not being conducted.

- There are no signed formal agreements with any outside agencies for fire protection activities, with the exception of NOSR-1 which has a Memorandum Of Understanding (MOU) with the Bureau of Land Management.

- See Concerns EP.1-2 and FP.1-2.

- This concern was fully identified in the DOE/NPOS R-CUW self-assessment (April 1992).

CONCERN: DOE/NPOS R-CUW Site Office has not established formal agreements with local fire departments to respond to emergencies, participate in drills and exercises, and to conduct quarterly visits to the sites as required by DOE 5480.7.
FP.7 PROGRAM IMPLEMENTATION

PERFORMANCE OBJECTIVE: A fire protection engineering program should be in place to effectively provide and maintain an "improved risk" level of fire protection.

FINDINGS:

- There is no documented Fire Barrier Maintenance programs in place as required by NFPA Standard 80 and DOE 5480.7.
- There have been no SARs, Fire Hazard Analysis, or other similar documents prepared to assess the potential impact of credible fires.
- An annual documented review of the Fire Protection Program is not being done.
- Procedures are not in place for the safe use of welding and cutting operations and the use of flammable and hazardous materials.
- Fire protection engineering surveys are not conducted as required by DOE 5480.7.
- Vital records storage and personal medical records storage do not meet current fire protection standards.
- This concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not meet the requirements relating to the Fire Protection Engineering Program as required by DOE 5480.7.

4.5.13 Medical Services

4.5.13.1 Overview

The Medical Services appraisal was conducted using all five performance objectives and the requirements of DOE 5480.8. Interviews and discussions were held with JBEC managers having responsibility for or interaction with medical programs. DOE/NPOSNR-CUN managers with oversight responsibility for health and safety activities were interviewed. Policy and procedure documents were reviewed. Medical records (patient charts) were examined. Providers of medical services were interviewed. Medical equipment was evaluated. The NPR-3 site was visited. Orientation and familiarity with numerous facilities were obtained. Managers, foremen, and employees encountered at random were interviewed. An emergency exercise was observed and comments were submitted for incorporation in Section 4.5.6 Emergency Preparedness.

Providing medical programs in compliance with DOE 5480.8 for a small work force dispersed at a remote site is a difficult task. There is a lack of understanding of most of the medical requirements of OSHA and DOE 5480.8, both by DOE/NPOSNR-CUN and JBEC. This has impeded implementation of the comprehensive Occupational Medical Program mandated by DOE 5480.8. The program lacks the leadership that needs to be exerted by a consultant physician trained and experienced in occupational medicine and knowledgeable of DOE 5480.8. Planning and prioritization of medical programs is driven and limited by allocation of resources rather than on an as required basis.

The medical program is not documented by a comprehensive written plan. Multiple policies and programs are present. Professional medical services are provided by contractors. Personnel, safety and health, and contractor procurement managers interact minimally with the contract physician. The contract physician does not participate in policy or program development and is not knowledgeable of them. Attempts to meet OSHA and DOE 5480.8 medical requirements fall short because of lack of professional involvement. The scope of existing programs, such as medical examinations for respirator use and audiograms, is limited by the arbitrary allocation of funds.

Examinations are performed on some new hires. Before assignment to respirator use, employees receive medical clearance. Audiograms are performed on employees exposed to noise. Other periodic examinations are not conducted. Health evaluation on termination of employment is not performed. Employees returning to work after an illness or injury absence are required to have a release from their personal physician but not from the contract physician.

JBEC has a comprehensive Drug Free Work Place policy, although it is infrequently and poorly communicated. New employees receive information as part of orientation and sign off that they have knowledge of the policy. Drug testing is done on all new hires and is required by policy to be performed for cause, but is not being implemented. It may also be required on a random basis after completion of a recovery program. There is no formal Employee Assistance Program (EAP). Employees seeking help for substance abuse are referred by the Personnel Section and are directed into programs covered by the company medical insurance plan. Although no formal wellness program is conducted, health education literature is available onsite and is distributed in mailings; articles on health appear in the JBEC newsletter.
Medical emergency care has been arranged. The first aid room is equipped for minor accident and illness response. Multiple first aid kits and disaster "jump packs" are distributed throughout the site. A defibrillator has not been obtained, because of the legal requirements restricting use of such equipment. First responders are emergency response team members, all of whom are first aid trained and many are emergency medical technician (EMT) trained. Community health care resources have been identified and informal arrangements have been made for support. The emergency response capability was demonstrated by an emergency exercise which was observed by the Tiger Team. The identification of victims was a secondary priority to other emergency activities.

Findings supported concerns about education and training, leadership, written plan, medical records, examination programs, and counseling and education. The DOE/NPOSR-CUW self-assessment identified some of the concerns. The JBEC self-assessment identified most of the concerns fully and others partially.
FINDINGS:
• Administration of the Workman’s Compensation Program is fragmented and decentralized. Administrative responsibility is delegated between the Personnel and Safety and Health Sections.

• There is a procedure for following lost time job incurred injuries, but it is not implemented. Currently physicians reports are obtained only after a 60-day absence interval. Total costs of the program including medical care, lost time payments, and permanent disability awards are not available.

• The following concern was not identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not have a centralized administrative program for the control of lost time costs, disability benefit payments, medical costs, and disability prevention as required by DOE 5480.8.

MS.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support of the medical services for the facility and site.

FINDINGS:
• JBEC policies and conduct of the Occupational Medical Program are delegated among the Personnel, Safety and Health, and Procurement Sections. There is no centralized direction.

• There is no cohesive comprehensive plan for the JBEC Occupational Medical Program.

CONCERN: See Concerns MS.1-1, MS.1-2, and MS.1-3.

FINDINGS:
• JBEC medical records do not contain comprehensive past medical history, work history, or exposure history.

• JBEC medical records do not contain a list of job requirements or hazards in the workplace.

• JBEC medical records do not chronicle the medical history after employment.

• Complete blood counts of JBEC personnel are not performed.

• JBEC medical records are retained by the contract physician with copies in the Personnel Section.

• JBEC audiograms are stored in the Safety and Health Section.

• Results of pulmonary function testing for the respiratory protection program on JBEC personnel are stored in the Safety and Health Section.

• See Concern OS.4-3.

• The following concern was partially identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not collect or maintain complete medical records, and existing records are not protected to assure confidentiality as required by DOE 5480.8.
MS.3 MEDICAL TREATMENT

PERFORMANCE OBJECTIVE: Medical treatment should be available and provided by qualified, competent staff, and adequate facilities should be available.

FINDINGS:
- Medical examinations are not performed on all JBEC new hires.
- Voluntary periodic examinations are not offered to the majority of the JBEC employees.
- JBEC employees returning to work after illness/injury absence of seven or more days do not receive a medical evaluation by the company physician before being allowed to return to work.
- The health of JBEC employees is not evaluated at termination of employment.
- JBEC personnel who have physical, chemical, or biological hazards in their workplace are not receiving periodic medical evaluations.
- Preplacement examinations include x-rays of the back for JBEC employees who will work in the field. This is not considered a good medical practice and is not in agreement with Federal directives for use of x-ray examinations.
- Urine samples for drug testing of JBEC personnel are not collected in a manner to assure reliability and to meet DOT standards.
- Audiograms performed for the JBEC Hearing Conservation Program are not interpreted by a certified audiologist. (See Concerns MS.1-3 and OS.2-1).
- The contract physician is not informed about the hazards or physical job analysis when asked to evaluate JBEC employees for respirator use. (See Concern MS.2-1).
- The following concern was partially identified in the JBEC self-assessment (April 1992).
- The operating contractor medical examination programs do not meet the requirements of DOE 5480.8 and other Federal requirements.

CONCERN: The operating contractor medical examination programs do not meet the requirements of DOE 5480.8 and other Federal requirements.

MS.5 PERSONNEL COMMUNICATION PROGRAM

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of the medical hazards that may be encountered in their work environment and of the medical services that are available.

FINDINGS:
- There is a JBEC substance abuse policy, but it is infrequently communicated and is not commonly known by JBEC employees.
- There is no formal JBEC Employee Assistance Program.
- There is no structured or formal wellness-health education program for JBEC personnel.
- See Concern OA.8-1.
- The following concern was fully identified in the JBEC self-assessment (April 1992).

CONCERN: The operating contractor does not have programs of counseling and health education as required by DOE 5480.8.
There were no noteworthy practices identified by the Safety and Health Subteam.

4.7 SYSTEM FOR CATEGORIZING CONCERNS

Each concern contained in this report has been characterized using the following three sets of criteria.

A. **Category I:** Addresses a situation for which a "clear and present" danger exists to workers or members of the public. A concern in this category is to be immediately conveyed to the managers of the facility for action. If a clear and present danger exists, the Assistant Secretary for Environment, Safety and Health, or his/her designee, is to be informed immediately so that consideration may be given to exercising the Secretary's facility shutdown authority or directing other immediate mitigation measures.

**Category II:** Addresses a significant risk or substantial noncompliance with DOE Orders but does not involve a situation for which a clear and present danger exists to workers or members of the public. A concern in this category is to be conveyed to the manager of the facility no later than the appraisal closeout meeting for immediate attention. Category II concerns have a significance and urgency such that the necessary field response should not be delayed until the preparation of a final report or the routine development of an action plan. Again, consideration should be given to whether compensatory measures, mitigation, or facility shutdown are warranted under the circumstances.

**Category III:** Addresses significant noncompliance with DOE Orders, or the need for improvement in the margin of safety, but is not of sufficient urgency to require immediate attention.

B. **Hazard Level 1:** Has the potential for causing a severe occupational injury, illness, or fatality, or the loss of the facility.

**Hazard Level 2:** Has the potential for causing minor occupational injury or illness or major property damage, or as the potential for resulting in, or contributing to, unnecessary exposure to radiation or toxic substances.

**Hazard Level 3:** Has little potential for threatening safety, health, or property.

C. **Compliance Level 1:** Does not comply with DOE Orders, prescribed policies or standards, or documented accepted practices. The latter is a professional judgment based on the acceptance and applicability of national consensus standards not prescribed by DOE requirements.

**Compliance Level 2:** Does not comply with DOE references, standards or guidance, or with good practice (as derived from industry experience, but not based on national consensus standards).
Compliance Level 3:
Has little or no compliance considerations. These concerns are based on professional judgment in pursuit of excellence in design or practice, i.e., these are improvements for their own sake and are not deficiency driven.

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4.8.2 Tabulations of Concerns

4.5.1 Organization and Administration

CONCERN: The operating contractor has not prepared safety and health plans as required by DOE 5480.18, paragraph 8.d.(6) and by its operating contract with the Department of Energy.

CONCERN: DOE/NPSR-CUW Site Office has not implemented a directives system (OA.1-2) and has not provided clear and timely guidance to the operating contractor.

CONCERN: DOE/NPSR-CUW Site Office has not enforced the safety and health and quality assurance provisions of the Department of Energy operating contract with the operating contractor.

CAT. II

CONCERN: The operating contractor operators do not have approved equipment at Naval Petroleum and Oil Shale Reserve Number 3.

CONCERN: The operating contractor field operations do not ensure that the safety and health and quality assurance provisions of its operating contract with the Department of Energy are met.

CONCERN: The organizational structure, responsibilities, and authorities for safety and health have not been clearly established by DOE/NPSR-CUW Site Office in accordance with DOE 5480.18, paragraph 8.d.(6)(a).

CONCERN: DOE/NPSR-CUW Site Office has not provided sufficient oversight of the operating contractor safety and health programs and related activities.

CONCERN: The operating contractor occurrence reporting system does not comply with the reporting, procedural, and lessons learned provisions of DOE 5000.3A.

CONCERN: DOE/NPSR-CUW Site Office does not meet the reporting and procedural provisions of DOE 5000.3A.

CONCERN: The operating contractor management has neither developed annual safety and health goals nor developed a process to communicate them to the organization as required by DOE 5480.19, Chapter 1, paragraph C.3.

CONCERN: Position descriptions do not provide clear documentation of safety responsibilities and clearly defined safety performance standards are not established as part of the operating contractor employee performance appraisal process as required by DOE 5480.19, Chapter 1, paragraph 8.

CONCERN: The operating contractor management has not developed a long range staffing plan as required by DOE 5480.19, Chapter 1, paragraph C.2.

4.5.2 Quality Verification

CONCERN: The operating contractor has not implemented a quality assurance program at Naval Petroleum Reserve Number 3 in accordance with DOE 5700.6C and the provisions of its operating contract with the Department of Energy.

CONCERN: DOE/NPSR-CUW Site Office has not implemented a quality assurance program in accordance with DOE 5700.6C, paragraph 10.e.

4.5.3 Operations

CONCERN: The operating contractor operators do not have approved Operation Procedures to aid them in performing their duties, as required by DOE 5480.19, Conduct of Operations.

CONCERN: The operating contractor operators do not have approved Operation Procedures to aid them in performing their duties, as required by DOE 5480.19, Conduct of Operations.

CONCERN: The operating contractor Policy and Procedure 1.3-27, Lock, Tag, and Try Procedure is incomplete and, consequently, not effective in ensuring safety of operations as required by DOE 5480.19.

CONCERN: The operating contractor field operations do not meet the intent of both the State of Wyoming and Federal Bureau of Land Management regulations regarding the use of blowout preventers on wells capable of flowing during wellworkover operations.

CONCERN: The operating contractor operations personnel do not effectively monitor the operating condition of equipment as required by DOE 5480.19.

CONCERN: Certain operating contractor facilities and drilling equipment are not operated in a safe and reliable manner as required by DOE 5480.19.

CONCERN: The operating contractor operators do not complete formal qualifications before operating alone as required by DOE 5480.19.
CONCERN: The operating contractor maintenance organization does not ensure effective implementation and control of maintenance activities and does not ensure that safety and engineering support are provided for work activities.

CONCERN: The operating contractor has permitted hazardous conditions to exist during continued operations, because of a backlog of electrical parts, which is not in accordance with DOE 4330.4A, paragraph 3.4.8.

CONCERN: The operating contractor Maintenance Program does not meet the systematic documentation requirements of DOE 4330.4A, paragraphs 3.3 and 3.4.

CONCERN: Use of outdated drawings, lack of written procedures, and lax enforcement of informal procedures by the operating contractor has resulted in unsafe practices in the field and does not meet the requirements of DOE 4330.4A.

CONCERN: The operating contractor has not provided personal protective equipment for all maintenance activities as required by DOE 4330.4A.

CONCERN: The operating contractor personnel have not been instructed on proper inspection and post-maintenance control procedures as required by DOE 4330.4A, Section 3.

CONCERN: The operating contractor engineering and safety assistance provided to the maintenance organization in the field has not been sufficient, and the maintenance organization has not maintained the material condition of components and equipment in a manner to prevent hazardous conditions caused by non-code installations, improper operation of equipment, and equipment deterioration to meet the requirements of DOE 4330.4A.

CONCERN: The operating contractor Preventive Maintenance Program does not always meet the intent of DOE 4330.4A, paragraph 3.6.1.

CONCERN: The operating contractor does not provide sufficient documentation and records storage in support of the maintenance program as required by DOE 4330.4A, Section 3.

4.5.4 Training and Certification

CONCERN: The operating contractor has not implemented a formal training program to ensure that operations, maintenance, and technical staff have required safety and health training and qualification training in accordance with DOE 5480.19, DOE 4330.4A, and DOE 5480.3.

CONCERN: The operating contractor training records are not maintained to enable verification of safety and health training requirements and job qualification requirements.

CONCERN: The operating contractor does not ensure that all subcontractors working onsite satisfy safety and health training and job qualification requirements specified in 29 CFR 1910 and 1926 regulations.

CONCERN: DOE/NPOS-CON Site Office does not ensure that the operating contractor and its subcontractors are meeting the training requirements of DOE Orders and 29 CFR regulations.

CONCERN: Not all operating contractor employees at the Naval Petroleum Reserve Number 3 receive occupational safety and health training appropriate to their needs as specified in 29 CFR 1910 and 1926.

CONCERN: The operating contractor does not generally provide training for supervisors and managers to prepare individuals for assigned responsibilities in accordance with DOE 5480.19.

4.5.6 Emergency Preparedness

CONCERN: The operating contractor Emergency Preparedness Program is not in compliance with the DOE 5500-series of Orders and with DOE 5480.18.

CONCERN: DOE/NPOS-CON Site Office does not have an Emergency Preparedness Program that is in compliance with the DOE 5500-series of Orders and with DOE 5480.18.

CONCERN: The operating contractor Emergency Management Plan and Emergency Plan Implementing Procedures do not address all facets of the emergency response functions and do not include Emergency Plan Administrative Procedures for conducting routine activities as specified in DOE 5500.1B and DOE 5500.3A.

CONCERN: The operating contractor does not conduct emergency preparedness training, hazardous materials emergency response training, and personnel protective equipment training as required by DOE 5500.3A and 29 CFR 1910.120.

CONCERN: DOE/NPOS-CON Site Office has not provided hazardous materials emergency response and personnel protective equipment training to their staff as required by DOE 5500.3A and 29 CFR 1910.120.

CONCERN: The operating contractor has not established an emergency preparedness drill/exercise program as required by DOE 5500.3A.

CONCERN: The operating contractor Emergency Operations Center does not have all equipment and the resources necessary to respond to an emergency as required by DOE 5500.2B, DOE 5500.3A, and DOE 5500.3A.
CONCERN: The operating contractor Emergency Management Plan and the Emergency Plan Implementing Procedures do not address all emergency assessment actions as required by DOE 5500.3A and DOE 5480.18.

CONCERN: The operating contractor has neither developed all personnel protection instructions nor obtained necessary equipment for emergency purposes as required by DOE 5500.3A and DOE 5480.18.

4.5.7 Technical Support

CONCERN: DOE/NPOSR-CPO Site Office has not ensured that facilities at the Naval Petroleum Reserve Number 3 are covered by a Safety Analysis Report as required by DOE 5481.1B.

CONCERN: The operating contractor does not formally require an independent safety and health review in the preparation and revision of Policy and Procedure documents.

CONCERN: The operating contractor does not provide effective electrical and mechanical engineering support to field operations at Naval Petroleum Reserve Number 3.

CONCERN: The operating contractor does not effectively incorporate safety in the engineering design and installation of facilities at Naval Petroleum Reserve Number 3 in accordance with DOE 4330.1A.

CONCERN: The operating contractor does not have an effective program to ensure that piping and instrumentation diagrams and other drawings are maintained current as-built in accordance with DOE 4330.4A.

CONCERN: The operating contractor does not have a formal program to collect, trend, and analyze performance data for equipment and systems important to operations and safety at Naval Petroleum Reserve Number 3 as required in DOE 4330.3A.

4.5.8 Packaging and Transportation

CONCERN: DOE/NPOSR-CPO Site Office has not established a policy for implementation of DOE 5480.3, DOE 1540.1, and DOE 1540.2, or the responsibility and authority for the shipment of hazardous materials as required by DOE 5480.19.

CONCERN: The operating contractor has not established a policy for implementation of DOE 5480.3, DOE 1540.1, and DOE 1540.2, or the responsibility and authority for the shipment of hazardous materials as required by DOE 5480.19.

CONCERN: The operating contractor does not have a training program for personnel involved in hazardous materials packaging and transportation operations as required by DOE 5480.3, DOE 5480.1B, and 49 CFR.


CONCERN: The operating contractor movements of hazardous materials do not comply with the safety requirements of DOE 5480.3 and 49 CFR.

CONCERN: The operating contractor does not conduct hazardous materials activities at the warehouse in compliance with DOE 5480.3 and 49 CFR.

CONCERN: The operating contractor does not meet the transportation requirements of DOE 5480.3 and 49 CFR with respect to deliveries of methanol and glycol to, and the shipment of propane and butane/gasoline mixture from, the Low Temperature Separation Gas Plant and the shipment of crude oil from the B-TP-10 Battery.

CONCERN: The operating contractor is not in compliance with the pipe external and external wall corrosion control requirements of 49 CFR.

CONCERN: The operating contractor has not ensured that the condition of the third party pipeline crossing Naval Petroleum Reserve Number 3 will not adversely affect safety at the site.

CONCERN: The operating contractor does not prepare and maintain records of hazardous materials movements as required by DOE 5480.3.

CONCERN: The operating contractor hazardous materials packaging and storage procedures are not in conformance with DOE 5480.3.

CONCERN: DOE/NPOSR-CPO Site Office has not assured that aviation charter pilots and aircraft comply with DOE 5480.13.

CONCERN: The operating contractor has not assured that aviation charter pilots and aircraft comply with DOE 5480.13.

4.5.9 Site/Facility Safety Review

CONCERN: The operating contractor Safety Review Committee does not have a charter specifying responsibility, authority, quorum, reporting requirements, and documentation in accordance with DOE 5482.1B.

CONCERN: The operating contractor Safety Review Committee does not ensure comprehensive and indepth reviews of all major items important to the safety of operations in accordance with DOE 5482.1B.

CONCERN: The operating contractor Safety Review Committee irregularly holds meetings which contradicts their Policy and Procedure 1.3-02.
The operating contractor does not perform periodic appraisals of the overall operation of each facility to ensure safety and health coverage as required by DOE 5482.18.

DOE/NPOCSR-CUN Site Office has not conducted functional appraisals to ensure safety and health coverage as required by DOE 5482.18.

The operating contractor has not conducted independent triennial appraisals of its safety and health internal review system as required by DOE 5482.18.

DOE/NPOCSR-CUN Site Office has not provided surveillance and oversight of the operating contractor's internal safety review system to ensure implementation according to the requirements of DOE 5482.18.

There is no operating contractor program to gather, evaluate, and trend either their inhouse or industry-wide operating experience data to improve safety and reliability.

4.5.11 Worker Safety and Health (OSHA) Compliance

The operating contractor guarding of walkways and maintenance of ladders is not in accordance with 29 CFR 1910, Subpart D, Walking and Working Surfaces.

Guarding is not in place for equipment operated by the operating contractor as required by 29 CFR 1910, Subpart O, Machinery and Machine Guarding.


Compressed gas cylinders are not stored by the operating contractor in accordance with 29 CFR 1910, Subpart Q, Welding, Cutting, and Brazing.

The operating contractor does not comply with 29 CFR 1910, Subpart S, Electrical for the control of explosion and electrocution hazards.

The operating contractor does not comply with 29 CFR 1910.147, The Control of Hazardous Energy (Lockout/Tagout) in that minimum performance requirements for the control of hazardous energy have not been established.

The operating contractor does not comply with 29 CFR 1910.110, Storage and Handling of Liquified Petroleum Gases.

The operating contractor does not comply with 29 CFR 1910.151, Medical Services and First-Aid.

The operating contractor does not comply with the hazardous material spill response requirements of 29 CFR 1910.120, Hazardous Waste Operations and Emergency Response.

The operating contractor does not comply with 29 CFR 1926 Subpart P, Excavations.

The operating contractor does not comply with 29 CFR 1926.550, Cranes and Derricks.

The operating contractor does not comply with the requirements of 29 CFR 1910.1200, Hazard Communication.

4.5.13 Occupational Safety

The operating contractor safety and Health Section does not provide all necessary support and oversight to the line organization for the implementation of the Occupational Safety and Health Program as required by DOE 5480.18 and DOE 5480.10.

DOE/NPOCSR-CUN Site Office does not provide support, guidance, and direction to the operating contractor regarding the Occupational Safety and Health Program as required by DOE 5480.18.

The operating contractor occupational safety and health program as defined in the Policy and Procedure Manual is not fully implemented, and various program elements are not in compliance with DOE 5480.4 and Occupational Safety and Health Administration standards.

The operating contractor has not identified all confined space hazards and does not control entries in accordance with Draft 29 CFR 1910.146 and ANSI Z117.1-1989.

The operating contractor has not identified, evaluated, and controlled many occupational safety and health hazards as required by DOE 5480.4, DOE 5480.10, and Occupational Safety and Health Administration standards.

The operating contractor has not evaluated and controlled the hydrogen sulfide hazard associated with the steamflood project as required by DOE 5480.10.
CONCERN: Processes and responsibilities for subcontractor safety surveillance have not been established by the operating contractor as required by DOE 5480.9.

CONCERN: The operating contractor does not conduct an effective surveillance and exposure monitoring program to ensure effective control of safety and health hazards as required by DOE 5480.10 and DOE 5480.1B.

4.5.14 Fire Protection

CONCERN: The operating contractor has not developed a Fire Protection Program as required by DOE 5480.7, DOE 6430.1A, and the DOE Fire Resource Manual.

CONCERN: DOE/NPOSR-CUII Site Office has not provided guidance to the operating contractor on resources, organization, and administrative systems necessary for the effective implementation and control of the Fire Protection Program as required by DOE 5480.7, DOE 6430.1A, and DOE Fire Resource Manual.

CONCERN: The operating contractor is not in full compliance with the National Fire Protection Association Standard 101, "Life Safety Code."

CONCERN: DOE/NPOSR-CUII Site Office is not in full compliance with the National Fire Protection Association Standard 101, "Life Safety Code."

CONCERN: The operating contractor has not established a Fire Barrier Program for controlling hazardous materials releases to the public from a credible fire according to the requirements of DOE 5480.7.

CONCERN: The operating contractor does not protect Naval Petroleum Reserve Number 3 facilities against property losses in excess of guidelines of DOE 5480.7 for a maximum credible fire.

CONCERN: DOE/NPOSR-CUII Site Office has not established formal agreements with local fire departments to respond to emergencies, participate in drills and exercises, and to conduct quarterly visits to the sites as required by DOE 5480.7.

CONCERN: The operating contractor does not meet the requirements relating to the Fire Protection Engineering Program as required by DOE 5480.7.

CONCERN: The operating contractor does not have a plan for implementation of the Occupational Medical Program as required by DOE 5480.8.

CONCERN: The operating contractor does not require the providers of medical services to implement the provisions of DOE 5480.8.

CONCERN: DOE/NPOSR-CUII Site Office does not require the operating contractor to implement the provisions of DOE 5480.8.

CONCERN: The operating contractor does not have a centralized administrative program for the control of lost time costs, disability benefit payments, medical costs, and disability prevention as required by DOE 5480.8.

CONCERN: The operating contractor does not collect or maintain complete medical records, and existing records are not protected to assure confidentiality as required by DOE 5480.8.

CONCERN: The operating contractor medical examination programs do not meet the requirements of DOE 5480.8 and other Federal requirements.

CONCERN: The operating contractor does not have programs of counseling and health education as required by DOE 5480.8.
<table>
<thead>
<tr>
<th>Area of Responsibility</th>
<th>Name/Organization</th>
</tr>
</thead>
</table>
| EH Senior Manager      | Oliver D. T. Lynch, Jr.  
Department of Energy  
Office of Performance Assessment |
| Team Leader            | Leonard M. Lojek  
Department of Energy  
Office of Performance Assessment |
| OE-IO Representative   | James S. Gilliam  
Department of Energy |
| Organization and       | Bernard R. Kokenge  
BRK and Associates, Inc. |
| Administration/Quality |                  |
| Verification           |                  |
| Operations/Site Facility | Robert J. Cordes  
Private Consultant |
| Safety Review          | F. Richard Myal (Drilling)  
CER Corporation |
| Maintenance            | Carl W. Mangus  
Private Consultant |
| Technical Support/     | Glenn A. Wham  
Private Consultant |
| Training and Certification |                  |
| Packaging and          | Robert D. Jones  
Office of Risk Analysis and Technology,  
Headquarters, Department of Energy |
| Transportation/        |                  |
| Pipeline Safety        |                  |
| Occupational Safety    | Gary J. Gottfried  
Apex Environmental, Inc. |
| Worker Safety          | William R. Murphy  
Murphy & Associates |
|                        | David M. Drury  
Safety Enhancement |
|                        | Pamela A. Claps (OSHA 1B Technician)  
Murphy & Associates |

<table>
<thead>
<tr>
<th>Area of Responsibility</th>
<th>Name/Organization</th>
</tr>
</thead>
</table>
| Fire Protection        | James B. Murphy (OSHA 1B Technician)  
Murphy & Associates |
| Emergency Preparedness | Jimmy E. Biggs  
Biggs Associates |
| Medical Services       | George P. Bailey  
Advanced System Technology, Inc. |
|                        | Donald E. Lentzen  
Department of Energy  
Office of Occupational Medicine |
|                        | Dr. Paul Mossman, M.D.  
Private Consultant |
|                        | Dr. Bernard S. Zager, M.D.  
Private Consultant |

<table>
<thead>
<tr>
<th>Report Support, Observers, and Liaison</th>
<th>Name/Organization</th>
</tr>
</thead>
</table>
| Lead Appraisal Coordinator            | Mary Meadows  
Department of Energy  
Office of Performance Assessment |
| Coordinators                           | Janice E. Hill  
EG&G Idaho, Inc. |
|                                        | Lydia G. Guerra  
M.H. Chew and Associates |
| Technical Editor                       | Robert F. McCallum  
MCMC, Inc. |
5.0 MANAGEMENT ASSESSMENT

5.1 PURPOSE

The Management Subteam conducted a management and organization assessment of environment, safety, and health (ES&H) activities performed by U. S. Department of Energy (DOE) and John Brown Engineers and Constructors Inc. (JBEC) personnel at Naval Petroleum Reserve Number 3 (NPR-3), Naval Oil Shale Reserve Number 1 (NOSR-1) and Naval Petroleum Reserve Number 3 (NOSR-3), which are part of the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW). The objectives of the assessment were as follows: (1) to evaluate the effectiveness of management systems and practices in terms of ensuring environmental compliance and the safety and health of workers and the general public, as well as their consistency with DOE goals, objectives, policies, procedures, and standards related to ES&H; and (2) to identify the root cause for the deficiencies found by the Tiger Team across all organizations and disciplines reviewed.

5.2 SCOPE

The scope of the assessment, from an ES&H perspective, included the following: (1) management commitment and leadership; (2) organizational structure and management configuration for clear lines of oversight and accountability; (3) planning and budgeting; (4) human resource management, including training and staffing; (5) management systems, including performance monitoring and assessment, and self-assessment; (6) conduct of operations; and (7) public and institutional interactions.

Interviews were held with managers, supervisors, and staff personnel representing a wide variety of program interests. Interviewees included personnel from the DOE Headquarters Office of Fossil Energy (FE) and the Office of Naval Petroleum and Oil Shale Reserves (DOE/NPOSR); DOE/NPOSR-CUW staff onsite at Casper, Wyoming; and employees of JBEC, the operating contractor.

The Management Subteam examined a number of key management areas, including DOE policies and directive systems, self-assessment systems, internal and external communications, and individual performance appraisal systems. Documents reviewed included DOE Orders; Secretary of Energy Notices (SENs); NPOSR-CUW Management Directives; program budget and planning guidance; the DOE contract with JBEC (Contract No. DE-AC01-86FE00986); policies; administrative procedures; implementation plans; program/project management plans; management agreements; standard operating procedures; FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBEC self-assessment activities; audit and appraisal reports; incident reports; job descriptions; and mission and function statements.

5.3 APPROACH

The Management Subteam conducted its assessment in accordance with the Tiger Team Guidance Manual, (February 1990). The Management Subteam also used the draft, Environment, Safety, and Health Management Performance Objectives and Criteria for Tiger Team Assessments, (August 15, 1991) in conducting this assessment. These performance objectives and criteria were one element used to evaluate findings gathered in the course of the review.
The Management Subteam interacted extensively with the Environmental Subteam and the Safety and Health Subteam to ensure the causal factors identified by all three subteams were considered in the identification and evaluation of root causes.

The Management Subteam assessment was conducted between June 22 and July 20, 1992. A list of the documents reviewed by the Management Subteam is provided in Appendix E-2. The biographical sketches of the subteam members are presented in Appendix A-4.

The Management Subteam initially developed an understanding of the organizational roles, responsibilities, and authorities of FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBC through review of a series of program documents prior to the subteam's arrival onsite. These documents included information on the FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBC organization, mission, and self-assessment activities. After the subteam arrival, briefings were conducted concerning the FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBC organizational structure, mission, and self-assessment activities. A presentation was also provided to subteam members concerning the DOE/NPOSR, DOE/NPOSR-CUW, and JBC personnel concerning ESH activities at NPR-3, NOSR-1, and NOSR-3; ESH policies and goals; and the adequacy of supporting documentation. These interviews were supplemented by a detailed review of supporting documentation describing such topics as the organization, roles, responsibilities, policies, plans, budgets, procedures, and performance criteria for the organizational elements performing ESH functions and operational programs at NPR-3, NOSR-1, and NOSR-3.

To further support the subteam's assessment while onsite, daily debriefings and consultations were held with the Environmental Subteam and the Safety and Health Subteam. The objective of these interactions was to uncover potential management and organizational problems that might be common to the findings of all of the subteams. The Management Subteam identified individuals to serve as points of contact with DOE/NPOSR-CUW, the Environmental Subteam, the Safety and Health Subteam. These points of contact attended the daily debriefings of the other subteams.

The Management Subteam provided DOE/NPOSR-CUW with 55 preliminary observations and JBC with 59 preliminary observations on July 1, 1992, to validate for factual accuracy. Subsequently, the Management Subteam prepared 24 findings and 13 action items based on the validated preliminary observations and additional interviews and document reviews. The resulting findings were reviewed for factual accuracy by DOE/NPOSR, DOE/NPOSR-CUW, and JBC.

The root cause analysis conducted by the Management Subteam has been integrated with the causal factors identified by the other two subteams. The results of the integrated root cause analysis are discussed in Section 2.4.

5.4 MANAGEMENT ASSESSMENT SUMMARY

The stewardship for the management and operations of the Naval Petroleum Reserve has been assigned to several different Federal agencies, since the reserve was established by the U.S. Congress in 1912. This culminated in the reserve being placed under the direction of DOE in 1977, as a result of the DOE Organization Act of 1977. The mission of the reserve, established by legislative mandate, is to produce and market oil and natural gas. Such a mission is not totally consistent with DOE's more conventional mission of high technology, research, and development. Consequently, it was never fully anticipated that many of the standards and requirements set forth in DOE Orders and directives would also be applied to what is the equivalent of a commercial oil field operation. However, with only a few exceptions, the principles embedded in the DOE policies and procedures related to the protection of the environment and the health and safety of individual workers and the public should be applied with equal force to the operations at NPOSR-CUW.

Because of the long history of the reserve related to the production and sale of oil and natural gas, the management styles and philosophies appear to be more closely modeled after those of the commercial oil and gas industry, rather than those associated with a government-funded and managed operation. The overall operation tends to be highly informal with a notable absence of documented policies and procedures, which is apparently characteristic of the field operations of the oil and gas industry. Verbal agreements are reached and decisions made which are rarely ever fully documented. Although this style and method of operation may have served the field organization well in oil exploration and production operations, it is not well suited for the development and implementation of a complex ESH program which requires a more structured and disciplined approach.

DOE/NPOSR-CUW and its operating contractor have taken some positive first steps to reshape the organization, as well as the management styles and philosophies which have prevailed for many years, to bring them into conformance with DOE requirements and standards. However, they are only in the formative stages and many of the DOE policy and procedural requirements, as well as the structure, form, culture and philosophy of the field operations are still relatively foreign to many elements of the field organizations. The Management Subteam believes there is an emerging recognition that the ESH requirements prescribed by DOE are indeed applicable to their oil and gas field operations and is optimistic that this recognition will continue to grow and develop, resulting in positive actions to fully comply with, or exceed, DOE requirements. The majority of the staff members have exhibited an awareness of the responsibilities and obligations, even though an ESH culture has not yet permeated all elements of the organization. The majority of the organizational components have not yet developed a real sense of ownership for the ESH mission and responsibilities and appear to be waiting for detailed step-by-step guidance.

Although the Secretary's program and objectives to achieve a level of excellence in ESH have now been a matter of record for more than 3 years, FE, DOE/NPOSR, and DOE/NPOSR-CUW have only recently initiated actions to fully comply with the spirit and intent of the program. As a result, many of the management systems, formal policies and procedures, and well-defined responsibilities, which would normally be expected to be in place in a nature...
organization, are only now in the formative stages of development. Some of
the necessary remedial actions to correct these deficiencies have been
initiated, but have not yet achieved the momentum necessary to carry them
through to a successful conclusion. It is expected that the findings of the
Tiger Team and the resultant corrective actions required by all levels of the
organization will serve as a catalyst to provide that momentum.

The legislative mandate to maintain production and profitability in the oil
field operations presents a financial barrier which could be a limiting factor
in the development and implementation of a comprehensive ESH program.
Although this constraint has long been recognized, there has been no visible
effort to develop strategic and operational plans to explore alternative
solutions. Moreover, DOE/NPOSR-CUW and the operating contractor have not yet
considered intermediate or compensatory actions which could be taken to
improve their ESH posture until longer term, or permanent solutions can be
developed and implemented.

It is the opinion of the Management Subteam that the overall ESH program
within DOE/NPOSR-CUW and the operating contractor is marginal at best. Due to
the economic constraints, the late start by all organizational elements to
develop a viable program, and the absence of effective management systems and
controls, it will be some time before they achieve full compliance with DOE
ESH requirements and even longer to reach the level of excellence expected by
the Secretary of Energy.

The Management Subteam recognizes that a new operating contractor has been
selected and will assume responsibility for management and operation of the
reserve in September 1992. This change will place a special burden and
responsibility on DOE/NPOSR-CUW and the new contractor to ensure that all of
the significant efforts to date, including the self-assessment findings, are
not lost in the transition. Carefully developed plans must be completed and
issued which articulate a precise course for the future operation and the
application of the full range of ESH requirements.

5.5 MANAGEMENT FINDINGS

FINDING MF-1 DOE/NPOSR Strategic and Operational Planning

The elements of the DOE/NPOSR planning process are not coordinated in a manner
that facilitates understanding of, and promotes consistency within, the
strategic and operational plans.

Discussion

Strategic planning for DOE programs is stipulated by the DOE Office of Policy,
Planning and Analysis (PE-60) in its "Guidelines for Strategic Planning"
(DOE/PE-0094, July 1991). The requirement for operational planning (for
safety) is included in DOE 5480.19, "Conduct of Operations" (July 9, 1990),
Chapter I, Section C.6. Carefully articulated, unambiguous strategic and
operational plans are essential to successful operation of all DOE sites. In
the judgment of the Management Subteam, the following observations relate to a
deficiency in the overall planning process for DOE/NPOSR:

- FE, DOE/NPOSR, and DOE/NPOSR-CUW all prepare and publish a number of
  planning documents. For example, FE issues a Safety & Health
  Five-Year Plan for all its sites, DOE/NPOSR issues a strategic
  plan, and DOE/NPOSR-CUW (in collaboration with its contractor)
  prepares a Long-Range (10-year) Plan, which is updated annually.
  However, there is no clearly evident coordination of these
  planning activities. This absence of coordination results in
  redundancy between the planning documents and creates difficulties
  in interpreting and monitoring plans for continued operations at
  NPOSR-CUW.

  Discussions with FE Headquarters personnel indicated that
  DOE/NPOSR management is aware of this problem. A memorandum
  ("NPOSR Working Groups," Tony Gunner to Captain Meeks, May 15,
  1992) establishes a Planning Process Working Group to "evaluate
  the current planning process and recommend a new process taking
  into consideration the Strategic Planning process and the new DOE
  requirements." The Planning Process Working Group chairperson is
  responsible for establishing schedules and milestones and
  accomplishing the goals in the group. As currently constituted,
  the Planning Process Working Group has no members from the field.

- The lack of planning coordination has contributed to the absence of
  a comprehensive evaluation of the risks and vulnerabilities
  associated with achievement of programmatic objectives versus
  achievement of environment, safety, and health (ESH) objectives.
  Specifically, no case studies have been hypothesized and analyzed
  for consequences of different allocations of ESH and operating funds.
Concern OA.1-3

Management Appraisal

This finding was partially identified in the DOE/NPOSR Internal Appraisal (June 1992).

This finding was partially identified in the DOE Office of Self-Assessment (July 1992).

FINDING MF-2 DOE/NPOSR-CUW Strategic and Operational Planning

The DOE/NPOSR-CUW planning and budget process does not include a proactive environmental, safety, and health (ES&H) component that complies with guidelines specified by the Secretary of Energy.

Discussion

The Secretary of Energy has mandated strategic planning and simultaneously placed a high priority on the formal integration of ES&H into the program planning and budgeting process. Guidance for this integration was provided in July 1991 by the DOE Office of Policy, Planning and Analysis (PE-60) in its "Guidelines for Strategic Planning" (DOE/PE-0099, July 1991). An additional requirement for the site development planning is cited in DOE 4320.1B, "Site Development Planning" (January 7, 1991). Planning, in general, is the key to successful operation of any site; incorporation of ES&H program elements into the site plans ensures that the site will be operated with proper consideration given to protection of workers, the public, and the environment.

The Management Subteam judged planning by DOE/NPOSR-CUW to have the following deficiencies:

- DOE/NPOSR-CUW does not have a single, comprehensive strategic or operational plan that addresses all elements of their ES&H program and integrates those elements with operational activities. Individual elements of a strategic plan are included in those documents that have been prepared (e.g., the NPOSR-CUW Long-Range Plans); however, these efforts have not produced the planning guidance needed to meet DOE requirements.

- The NPOSR-CUW Long-Range (10-year) Plans that have been issued thus far (1) do not address the safety and health components of the ES&H program, and (2) treat the environmental component in a largely superficial manner. In fact, these planning documents are, for the most part, limited to operational and production elements plus strategies associated with marketing and profitability. ES&H requirements and objectives are not presented in a manner such that prioritization and proper integration with operational strategies can occur.

- A strategic plan issued for all of NPOSR on May 5, 1992 ("FY 1994 Strategic Plan, Naval Petroleum and Oil Shale Reserves") follows the guidance on format cited in DOE/PE-0099, but does not specifically address the program at the Naval Petroleum Reserves Number 3 (NPR-3) and omits any reference to the ES&H programs at other NPOSR sites. This plan was prepared at FE Headquarters exclusively by DOE/NPOSR personnel, but was reviewed by the Director, DOE/NPOSR-CUW. A new effort is underway to revise the strategic plan by involving more field personnel in its formulation. A strategic planning workshop for this successor plan was held in Boulder, Colorado in April 1992; ES&H was a topic of discussion at this workshop. A second group effort is scheduled for late July 1992. At this time, however, there is no way of determining whether (and if so, to what degree) ES&H...
program considerations for the NPOSR-CUW sites will be addressed in the new strategic plan.

- The budget guidance provided by FE to DOE/NPOSR-CUW has not been specific toward enhancing the ES&H program. Basically, DOE/NPOSR has provided DOE/NPOSR-CUW with the total annual budget allocation, and no specific guidance with respect to the emphasis to be placed on the ES&H programs. Furthermore, no effective system is in place for resolving disparities between budget guidance and site needs to meet increasing ES&H program demands.

- In accordance with headquarters instructions, DOE/NPOSR-CUW recently issued "U.S. DOE Safety & Health 1994 Five-Year Plan for NPOSR-CUW" (May 1, 1992), which addresses the proposed enhancement of safety and health measures at the site for FY 1994-1998. The plan does not fulfill the need for a comprehensive plan for the site that (1) integrates ES&H with operational activities and (2) provides a mechanism for evaluating trade-off decisions between ES&H and operations.

- DOE/NPOSR-CUW has completed initial corrective action plans in response to the findings included in their self-assessment report (April 1992). Although these plans contain a significant number of individual commitments associated with an integrated ES&H system, these commitments have not been consolidated into a comprehensive coordinated plan that integrates all the proposed ES&H actions with operational commitments to ensure that the total program can be accomplished.

- DOE/NPOSR-CUW has not issued the "Site Development Plan" and the "Technical Site Information" document mandated by DOE 4320.1B. A draft of the "Site Development Plan" is being reviewed by DOE/NPOSR personnel. A draft "Technical Site Information" document is scheduled to be issued by the end of FY 1992.

Cross References

Concern OA.1-3

Self-Assessment

This finding was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal

This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was fully identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

FINDING MF-3

DOE/NPOSR and DOE/NPOSR-CUW Resource Management

DOE/NPOSR-CUW and DOE/NPOSR have not made the necessary commitment to environment, safety, and health (ES&H) excellence called for in DOE initiatives, while simultaneously complying with the Naval Petroleum Reserves Production Act of 1976. DOE/NPOSR has not provided guidance to DOE/NPOSR-CUW regarding alternatives which might enhance the probability of attainment of programmatic and ES&H objectives.

Discussion

The Secretary of Energy's 10-Point Initiative dramatically changed the philosophy and manner in which the entire DOE complex operates. The achievement of ES&H objectives was identified as having an increased level of significance, and the attainment of programmatic objectives could not be viewed in isolation; i.e., they were inextricably linked to accomplishment of ES&H objectives. This fundamental change has required that the entire DOE complex reevaluate the way it conducts its mission and has established the need to identify, consider, and implement innovative solutions for obtaining the maximum level of achievement of programmatic and ES&H objectives. DOE/NPOSR-CUW has not been innovative in considering and developing such solutions, and DOE/NPOSR has not been proactive in providing guidance to DOE/NPOSR-CUW regarding realization of programmatic and ES&H objectives.

The Management Subteam recognizes that NPOSR-CUW must address an additional consideration in the successful execution of its mission, which is a derivative of the Naval Petroleum Reserves Production Act of 1976, Public Law (P.L.) 94-258, as amended. This Act directs the Secretary of the Navy to produce Naval Petroleum Reserve Number 3 (NPR-3) at the "maximum efficient rate." This clause has been interpreted by the Office of Management and Budget and others to require "economic viability" for the operations budget (which is defined as having an increased level of significance, and the attainment of programmatic objectives could not be viewed in isolation; i.e., they were inextricably linked to accomplishment of ES&H objectives. This fundamental change has required that the entire DOE complex reevaluate the way it conducts its mission and has established the need to identify, consider, and implement innovative solutions for obtaining the maximum level of achievement of programmatic and ES&H objectives. DOE/NPOSR-CUW has not been innovative in considering and developing such solutions, and DOE/NPOSR has not been proactive in providing guidance to DOE/NPOSR-CUW regarding realization of programmatic and ES&H objectives.

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- The interpretation of P.L. 94-258, which leads to the profitability requirement, seriously limits the allowable increase in budget that can be applied to enhancing ES&H programs. With this constraint, increases in the ES&H budget must come either from corresponding decreases in the operating budget (which conceivably could decrease the production/cash flow and thereby compound the problem) or from alternative sources of funds for ES&H items. The DOE/NPOSR-CUW response to the Management Subteam is the examination of alternatives available to DOE/NPOSR-CUW to maximize achievement of programmatic and ES&H objectives, while simultaneously responding to the letter of the Naval Petroleum Reserve Production Act. For example:

- DOE/NPOSR-CUW has not been proactive in requesting, nor has DOE/NPOSR been proactive in supplying additional resources (internal to DOE or contractors) to assist NPOSR-CUW in developing and improving its ES&H program. Although FE and DOE/NPOSR have provided significant attention and assistance to NPOSR-CUW in 1992.
after notification of the impending Tiger Team Assessment, little assistance was sought or offered prior to 1992, except when driven by specific events or requirements. Institutionalization of the self-assessment program has increased the formality of operations. Moreover, the development of management systems, as identified in the self-assessment at NPOSR-CUW and in the Tiger Team Assessment, should enhance the communication of resource needs and availability.

Similarly, the guidance that DOE/NPOSR provides to DOE/NPOSR-CUW has not historically included any policy direction as to what level of commitment DOE/NPOSR-CUW should exercise in achieving programmatic and ES&H objectives, while remaining consistent with the operational interpretation of P.L. 94-258.

The position of Environmental Specialist was created in 1989; however, since that time DOE/NPOSR-CUW has not increased or re-allocated ES&H responsibilities and has not reallocated any existing full-time equivalents (FTEs) to ES&H-related positions.

The March 1991 reorganization at FE that separated NPOSR from the Strategic Petroleum Reserve left eight open positions in NPOSR. Seven of these positions have now been filled, six since September 19, 1991. Although significant additional planning, budgeting, reporting, and other program-related responsibilities were transferred to NPOSR along with these eight FTEs, NPOSR chose to fill seven of the eight positions with technical and clerical personnel. The 1 ES&H position, filled in March 1992, is the only 1 of 18 FTEs in NPOSR with full ES&H responsibilities, and the only non-management-level position with specific ES&H responsibilities. This unique opportunity to allocate a large number of vacant positions came during a time when FE had been made aware of significant ES&H programmatic deficiencies in FE programs through Tiger Team Assessments of the Morgantown and Pittsburgh Energy Technology Centers, and when the Department's ES&H initiatives and programs were getting significant and increasing emphasis. NPOSR and FE management failed to use this opportunity to re-allocate their FTEs consistent with the increased DOE emphasis on the achievement of ES&H objectives.

DOE/NPOSR-CUW has requested two new FTEs for FY 1993, which it proposes to fill with ES&H experts. The fact that historically there have not been annual increases in overall site budgets and DOE staffing levels, combined with the fact that initial discussions between DOE/NPOSR-CUW and FE personnel have indicated that the prospects for DOE/NPOSR-CUW's being awarded these additional personnel are not favorable. In spite of this fact, there is no indication that DOE/NPOSR-CUW has developed an alternative plan as to how it would cover increased ES&H demands if the extra personnel slots are not awarded. Alternatives might include re-assignment of operations personnel to ES&H positions or obtaining the services of ES&H experts, at no cost increment to DOE/NPOSR-CUW, from other sites by temporary "detailing" to NPOSR-CUW. In addition, there is no interim plan describing how DOE/NPOSR-CUW proposes to address the need for increased ES&H emphasis, while the decision on additional FTE slots is pending.

Cross References
Finding QA/CF-6
Self-Assessment
This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of DOE/NPOSR (July 1992), was partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992), and was partially identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

DOE/NPOSR Internal Appraisal
This finding was not identified in the DOE/NPOSR internal appraisal (June 1992).
JBEC Environment, Safety, and Health (ES&H) Program Implementation Plan

JBEC has not developed an implementation plan which both integrates and prioritizes operational and ES&H activities.

Discussion

DOE 5480.1B, "Environment, Safety, and Health Program for Department of Energy Operations" (September 23, 1986), Section 8.d.(4) requires that DOE site contractors execute programs and policies in a manner that complies with mandatory requirements relating to ES&H. DOE 5480.1B, Section 8.d.(6) stipulates preparation of an implementation plan, which is defined as "a concise description of the approach, resources, and time period planned for implementing Orders that require such plans on a site-wide basis," with the additional requirement that the plan include a description of the execution of ES&H responsibilities. In the judgment of the Management Subteam, the JBEC implementation plans have the following deficiencies:

- The Annual Operating Plan (AOP), prepared by JBEC but approved and issued by DOE/NPOSR-CUW, cites programmatic activities (e.g., goals and objectives) for the upcoming fiscal year with ES&H activities included. However, the AOP does not cite definitive guidance on priorities in the event of budgetary constraints or programmatic changes.

- Although JBEC's planning and budgeting process identifies ES&H internal management and oversight functions, the process does not identify those ES&H activities which are conducted as part of management and operating functions. Thus, the reported ES&H expenditure understates the actual effort.

- JBEC has not performed a detailed staffing-needs analysis to justify the addition of ES&H personnel to meet increased regulatory requirements. The Safety and Health Five-Year Plan cites a requirement for additional personnel, but the more detailed analysis, including requirements for incremental environmental staff, is needed to prepare a meaningful ES&H program implementation plan.

- Comprehensive evaluation has not been performed of the risks and vulnerabilities associated with achievement of programmatic objectives versus achievement of ES&H objectives. Specifically, no case studies have been hypothesized and analyzed for consequences of different allocations of ES&H and operating funds.

- JBEC has completed initial corrective action plans in response to the findings included in its self-assessment (April 1992). These plans contain a significant number of individual commitments associated with the design and implementation of an integrated ES&H system. However, JBEC has not consolidated these commitments into a comprehensive implementation plan that integrates all of the proposed ES&H actions with operational commitments to ensure that all of the program objectives can be achieved.

Cross References

Concerns OA.1-1 and OA.6-2

Self-Assessment

This finding was fully identified in the JBEC self-assessment (April 1992).

Management Appraisal

This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was fully identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).
FINDING MF-5  JBEC Corporate Support

JBEC Houston, the corporate office, does not have a formal or a consistently applied informal oversight program to assure compliance with the provisions of its contract with DOE/NPOSR, Contract No. DE-AC01-86FE60896. Similarly, they do not have a formal system or method to provide environment, safety, and health (ES&H) planning or policy guidance to JBEC (Casper).

Discussion

JBEC Houston recently identified some broad corporate planning objectives which include ES&H-related elements. However, it has not yet completed a strategic planning process or system to provide corporate planning guidance or assistance to JBEC. Consequently, JBEC does not have a subordinate strategic plan that integrates corporate objectives and strategies and contractual requirements with specific DOE planning requirements to serve as an integrated sitewide plan to achieve the ES&H goals and objectives set forth by the Secretary of Energy.

JBEC Houston has demonstrated an active interest in the operational activities of JBEC and has initiated a number of independent reviews and assessments of ES&H activities which have produced several meaningful findings and recommendations. However, the implementation or disposition of those findings and recommendations was largely left to the discretion of the management staff at JBEC. The corporate office does not have a formal corrective action system to identify and track findings or deficiencies to closure. Without a corporate mandate for corrective action and the assignment of specific responsibilities, many of the findings have neither been implemented nor tracked to closure.

JBEC Houston does not have a formal or structured internal oversight program to ensure that it has fully complied with all of the requirements and deliverables set forth in its contract with DOE/NPOSR. Therefore, many of the reviews or assessments which have been provided were in response to specific problems or deficiencies identified by DOE.

JBEC Houston does not have formal corporate-wide policies and procedures related to ES&H to be applied to field operational units.

JBEC Houston conducts a formal evaluation of the performance of the JBEC General Manager annually. According to the senior executive who performs this evaluation, ES&H is an implicit factor in the evaluation. However, no specific, measurable goals or objectives have been established as yet.

The Tiger Team was verbally advised that JBEC Houston is responsible for overseeing execution of the actions which will be required as a result of the June 1992 JBEC Self-Assessment Implementation Plan (SAIP) and the JBEC self-assessment (April 1992). JBEC corporate-level resources will be used annually to conduct independent evaluations of the JBEC Self-Assessment Program. However, JBEC Houston has not yet reviewed the SAIP and is providing only periodic checks of progress on implementation of the specified actions. Oversight is performed informally through review of reports prepared by JBEC local staff and routed to the corporate office.

Cross References

Findings MF-12; Section 4.5.1.1

Self-Assessment

This finding was partially identified in the JBEC self-assessment (April 1992).

Management Appraisal

This finding was not identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992). The June 1992 report addressed some corporate activities, but none of them were related to the findings in MF-5. This finding was not identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).
FINDING MF-6  DOE/NPOSR-CUW Roles, Responsibilities, and Authorities

DOE/NPOSR-CUW has not adequately defined, formally documented, or communicated environment, safety, and health (ES&H) roles, responsibilities, authorities, and interfaces necessary to ensure that they are commonly understood and applied by all organizational elements, including contractors and subcontractors.

Discussion

The definition of roles, responsibilities, and authorities and the subsequent designations of authority are important first steps in the development and implementation of a comprehensive ES&H program. ES&H roles, responsibilities, and authorities should be developed in a hierarchical order, beginning with an organizational charter of NPOSR-CUW and roles and responsibilities of the Director on through each organizational element and ending with the individual employees as appropriate. These designations and delegations should be reflected in unit charters, applicable policies and procedures, individual position descriptions, etc. Such a process should also establish appropriate interfaces and linkages between top management, the ES&H organization, and those responsible for line operations, including the contractor organization. It is equally important that these determinations be further incorporated into appropriate operating policies and procedures which establish the internal process for ensuring that ES&H considerations and requirements are consistently considered and applied to all elements of the existing operation, as well as proposed modifications or new initiatives. Well-defined roles, responsibilities, and authorities further establish a documented line of accountability from the Director, DOE/NPOSR-CUW through each operational unit, including contractors. Organizations or individual employees should not be held accountable unless their responsibilities have been fully defined and they have been delegated adequate authority to carry out those responsibilities.

Organizational roles, responsibilities, and authorities have recently been partially defined and included in unit charters. However, they are generic in nature and do not include the full range of responsibilities and authorities necessary to formulate and implement a comprehensive integrated ES&H program for DOE and contractor operations and activities, such as ES&H planning, inspections and oversight, policies and procedures, training requirements, resource management, and any support systems which may be required for tracking of commitments and corrective actions. (See Findings MF-11 and MF-15.)

Primary responsibility for the safety and health program has been assigned to the Contract Surveillance and Administration Division. This organization does not have the requisite resources, training, or technical expertise to fulfill the total spectrum of its responsibilities which includes policy formulation, interpretation, and site-specific application of DOE Orders and directives, program direction, oversight, and compliance functions. The DOE/NPOSR-CUW Five-Year Safety and Health Plan states that only 10 percent of a full-time equivalent position is being dedicated to safety and health functions. As a result of these limitations, the division is almost totally dependent on other organizations for internal technical support as well as oversight of field operations and activities. However, these support arrangements are largely informal, undocumented, and are not consistently or uniformly applied. For example, both the Engineering Division and the Environmental Specialist have an informal responsibility to provide findings and observations which were developed during the course of their routine field inspections to the Director, Contract Surveillance and Administration Division. However, there is no formal mechanism for the assignment or acceptance of responsibility and accountability for corrective actions or a formal method of tracking remedial actions to closure, including verification of the completed action.

Responsibility and authority for the review of engineering designs for new projects, the modification of existing facilities, and the review of work authorizations to ensure that all appropriate ES&H criteria and requirements have been considered and incorporated has not been established and documented. Limited informal ES&H reviews are performed by the engineering organization without any involvement by the ES&H staff. (See Finding MF-15.)

DOE/NPOSR-CUW has not developed formal operating policies and procedures which include assigned roles and responsibilities for all elements of the ES&H program and further define the internal process for the application of those responsibilities, such as the review and approval of work authorizations, engineering changes, and proposed corrective or remedial actions. (See Finding MF-15.)

In summary, DOE/NPOSR-CUW has taken some initial actions to define ES&H roles, responsibilities, and authorities, such as developing unit charters and modifying many of their individual employee position descriptions. However, it has not yet clearly defined the full range of specific responsibilities required to formulate, implement, and direct a comprehensive ES&H program.

Cross References

Findings MF-11 and MF-15; Concerns OA.1-5 and OS.1-2

Self-Assessment

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal

This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was partially identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).
FINDING MF-7

DOE/NPOSR-CUW Stop and Start Work Authority

DOE/NPOSR-CUW has not developed and issued clear and definitive criteria or guidance setting forth responsibilities and authorities for temporary shutdowns or stopwork and restart actions.

Discussion

DOE/NPOSR-CUW has not issued formal policies or procedural guidance which adequately establishes responsibilities and authorities for environment, safety, and health (ESH)-related temporary shutdowns or stopwork actions and the circumstances under which they are to be applied to ensure a common understanding and uniform application by personnel, including contractors, in all organizational components of NPOSR-CUW. Based on interviews with personnel at different levels within DOE/NPOSR-CUW and the contractor organizations, the application of temporary shutdown or stopwork authority is not uniformly understood. Similarly, the criteria and authority, as well as the review process, for restarting an operation once it has been stopped for ESH deficiencies have not been specifically established in policies and procedures.

In the absence of specific procedures, there is no formal requirement for supervisors or employees to document and report all incidents involving the exercise of shutdown or stopwork authority. All such information is an important resource in conducting risk assessments, communicating lessons learned to other departments, and compiling data for trend analysis.

Cross References

None

Self-Assessment

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal

This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was partially identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

FINDING MF-8

JBEC Organizational Roles, Responsibilities, and Authorities

Organizational roles, responsibilities, and authorities which address all applicable elements of a comprehensive environment, safety, and health (ESH) program have not been fully defined by JBEC and included in formal policies and procedures.

Discussion

The organizational roles and responsibilities of the Safety and Health Section were partially identified in Policy and Procedure 1.3-02, "Organizational Safety Responsibility" (May 1992). However, authorities of the Manager, Safety and Health Section, as well as other organizational components such as line organizations which empower them to carry out their assigned responsibilities have not been specifically identified. The procedure states that the chain of safety and health authority from the manager to each employee is reflected in the organizational chart. However, that chart appears to reflect the chain of command as opposed to specific authorities.

The current policy and procedure states that the Manager, Safety and Health Section, advises and assists management and supervisors, coordinates all safety activities, and notifies management of problems and concerns.

Responsibilities for the formulation of site-specific policies and procedures as well as compliance enforcement, independent oversight, and the conduct of annual or triennial appraisals are not specific. Unit charters, which might further clarify those ESH responsibilities, have not yet been completed.

A Management Planning Committee has been appointed to ensure maintenance of safety measures to protect the health and safety of JBEC employees which will, among other things, review current and proposed projects for adequacy of safety controls. This committee is chaired by the General Manager and includes the managers of all operational and staff organizations.

A Safety Review Committee has also been appointed which, in part, will also review current and proposed projects for adequacy of safety controls. This committee is chaired by the Manager, Safety and Health Section, and the membership is identical to the Management Planning Committee with the exception of the Planning, Evaluation, and Control Coordinator who serves only on this Management Planning Committee. The General Manager is a member, and provisions have been made for DOE/NPOSR-CUW to be represented.

The charters of those two committees suggest that they have been structured to satisfy the DOE requirement for independent review and oversight. However, several of the key members have other direct or indirect responsibilities for the management of the majority of the operating facilities and for meeting the production and profitability goals established by DOE. Therefore, it is unlikely that these committees could satisfy the requirements set forth in DOE 5482.18, "Environment, Safety, and Health Appraisal Program," for independent reviews or oversight to ensure an acceptable level of checks and balances between production operations and ESH. Moreover, safety committees generally serve in an advisory capacity to the General Manager who either approves or disapproves the Findings and recommendations of the committee. Since the General Manager chairs one committee and is a member of the other, there is no higher level of review or mechanism to resolve disputes or appeals.
JBEC Policy and Procedure 1.5-01, "JBEC Environmental Policy," which sets forth roles and responsibilities for the formulation and execution of environmental programs, is outdated and has not been amended to reflect the new organizational structure. This procedure identifies some, but not all, of the responsibilities for both the Environmental Manager and the operational and staff organizations. Although regulatory compliance and independent oversight functions, as required by DOE policies, are implicit in some of the functional responsibilities which are now assigned to the Environmental Manager, they are not specifically identified.

Independent oversight of the total ES&H program, as required by DOE policies, are often difficult to achieve in a small organization with limited resources. The current organizational structure and the assignment of responsibilities within JBEC neither emphasizes the importance of independence nor assures that adequate provisions have been made for the conduct of formal appraisals. The Safety and Health and the Environmental Sections staff members are responsible for formulating internal policies and procedures; providing site-specific interpretations regarding compliance with DOE, Federal, and state regulatory requirements; providing technical support and guidance to the line organizations; and serving as the compliance arm for the organization. In many cases, the same individual could potentially be involved in all of these functions which diminishes the effectiveness of internal checks and balances.

ES&H-related responsibilities, authorities, and requirements have not consistently been incorporated into other operational or management policies and procedures, including several that have been issued within the past few months. For example, Policy and Procedure 3.3-02, "Management of Construction Projects," promises reasonably good coverage of ES&H requirements and specifies the responsibilities of each participant. (Authorities of each of the participants are implicit but not specifically stated.) However, Policy and Procedure 1.1-14, "Project Management," (May 12, 1992), does not discuss the ES&H responsibilities and requirements for project management.

Finally, training responsibilities at JBEC are currently divided between the Safety and Health Section and the Personnel Section. Since an overall training program plan has not been developed, the specific responsibilities, authorities, and interfaces between these two organizations, as well as requirements from other elements of the JBEC organization have not been defined.

Cross References
Findings MF-11 and MF-15; Concerns FR.1-1, FR.2-1, FR.4-1, and FR.5-1

Self-Assessment
This finding was partially identified in the JBEC self-assessment (April 1992).

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOS/CRUW (June 1992) and was partially identified in the DOE/NPOS Office of Planning and Technical Assurance management appraisal of NPOS/CRUW (May 1992).

FINDING MF-9  JBEC Individual Roles, Responsibilities, and Authorities

Individual roles, responsibilities, and authorities related to environmental, safety, and health (ES&H) functions have not been clearly established and communicated to all JBEC employees.

Discussion
An effective and enduring cultural change which places the proper emphasis on ES&H will occur only when each employee fully understands, and accepts ownership of, ES&H responsibilities for their own functional areas and those of the total operation. Generic statements of responsibility and accountability have not been effective in bringing about desired cultural changes in the work place. In general, individual employees are willing to accept those responsibilities once management’s expectations have been clearly expressed and consistently and fairly applied.

Individual position descriptions have not yet been completed or modified to fully reflect the specific responsibilities and authorities of individual employees for ES&H functions.

JBEC recently designed a new form for the conduct of employee performance evaluations which includes ES&H factors. However, these factors only reflect a generic description of expectations which is uniformly applicable to all employees regardless of their position or responsibilities. For the most part, these generic factors deal with attitudinal characteristics as opposed to job-specific and measurable goals and objectives. There is a provision for supervisors to include a narrative evaluation of each rating element. However, these evaluations are provided "after the fact," thus, they cannot be used as a means of establishing specific management expectations in advance.

The JBEC Employee Performance Appraisal System does not require or encourage employees to prepare annual development plans for themselves.

Cross References
Concern OA.6-1

Self-Assessment
This finding was fully identified in the JBEC self-assessment (April 1992).

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOS/CRUW (June 1992) and was partially identified in the DOE/NPOS Office of Planning and Technical Assurance management appraisal of NPOS/CRUW (May 1992).
FINDING MF-10

JBEC Stop and Restart Work Authority

Roles, responsibilities, authorities, and criteria for a temporary shutdown or stopwork and subsequent restart have not been clearly defined to ensure a common understanding and uniform application by all organizational elements of JBEC.

Discussion

The concept of stopwork responsibilities and authorities within JBEC seems to be reasonably well understood at the higher levels of the organization. Although some interim instructions have been issued, the authorities and the circumstances under which they are to be applied have not been clearly set forth in a formal site-specific policy or procedural statement which can be distributed to all levels of the organization. There appears to be a prevailing notion within lower tier organizations that a temporary shutdown or stopwork authority is only to be applied to operations which pose an immediate threat to the lives of employees or if it involves imminent danger to the operating facility. However, supervisors and employees should also be empowered to initiate a temporary shutdown or to stop work in situations which have the potential to produce unacceptable environmental consequences.

The criteria and the authority for restarting an operation once it has been stopped have not been clearly defined and included in existing JBEC Policies and Procedures. There is no requirement for the corrective actions to be reviewed by a member of the environment, safety, and health staff or higher levels of management prior to restart. The fact that restart authority is limited to DOE under certain circumstances as set forth in DOE Orders does not appear to be well understood.

There is currently no formal requirement for JBEC supervisors or employees to document and report all incidents involving temporary shutdown or stopwork authority. All such information is an important resource in conducting risk assessments, communicating lessons learned to other departments, and compiling data for trend analysis.

Cross References

None

Self-Assessment

This finding was partially identified in the JBEC self-assessment (April, 1992).

Management Appraisal

This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOS-R-CUW (June 1992) and was partially identified in the DOE/NPOS Office of Planning and Technical Assurance management appraisal of NPOS-CUW (May 1992).

FINDING MF-11

DOE/NPOS-CUW Training Program

DOE/NPOS-CUW has not implemented a formal, effective, and comprehensive environment, safety, and health (ES&H) training program.

Discussion

Training of all personnel in the subject fundamentals and on practices to be followed is a vital component of effective ES&H program implementation. Training provides assurance that (1) personnel are knowledgeable and kept up to date on ES&H issues and, thus, are better able to perform their duties in accordance with ES&H regulations, (2) a safer work environment is created, and (3) greater protection for the environment is provided. In order to establish a uniform understanding of purpose and structure, responsibilities and authorities should be defined and documented which identify responsibility for determining the magnitude and scope of the training program to be established. This process should include, but not be limited to, an identification of the training which has been provided to existing employees, a determination as to what additional training should be provided to fill any voids that were detected, and the method of delivery (i.e., internal formal training course, on-the-job training, external training, etc.). Training should be planned and tailored to the specific needs of the individual employees and should include an appropriate progression of training courses from the most basic introductory level, if appropriate, through increasingly more complex courses. This should be continued until the training manager and/or the immediate supervisor is satisfied that the individual is fully prepared to carry out the full range of his/her responsibilities. Refresher training and a process to identify needed or revised ES&H issues must also be established.

Specific program elements that are needed for a comprehensive and fully effective training program include the following: (1) a job-specific needs evaluation, (2) a syllabus for each position stipulating what training courses should be completed, (3) a training records system that alerts the individual when completion of training or retraining is delinquent, and (4) a mechanism to evaluate the effectiveness of training.

The essential elements of an effective ES&H training program are not in place at DOE/NPOS-CUW, as evidenced by the following:

- The DOE/NPOS-CUW training program essentially consists of the Administration Office Manager’s being responsible for maintaining training records. However, responsibility for developing and maintaining an explicitly defined training program for local DOE personnel has not been assigned. As a result, there is no established framework for a definitive training program with articulated training policy, goals, and expectations. Also, previously prepared training procedures (e.g., SOP 04-34-19, "Training Program NPOS-CUW," May 19, 1987) are not in use.

- Discussions with DOE/NPOS-CUW managers with responsibility for ES&H program activities indicated that no job-specific training needs evaluation to identify ES&H training requirements for staff members has been made. As a result, no implementation plan for fulfilling identified training needs has been developed, and the
ES&H training provided to staff has been very limited. (See Finding MF-14.)

- Interviews with staff members who have assigned responsibilities in the ES&H program revealed training deficiencies in that area for the individual staff members. This includes the organizational element responsible for the Contract Surveillance and Administration Division, which has primary responsibility for the safety and health program. It is not evident that this organization has the requisite resources, training, or technical expertise to fulfill the total spectrum of its responsibilities. Similarly, the Environmental Protection Specialist and the engineering staff who provide support to the DOE/NPOSR-CUW ES&H functions have not been trained in the full range of activities for which they are responsible. (See Finding MF-6.)

- A total of 222 training courses (including conferences) have been provided to DOE/NPOSR-CUW employees during the past 6 years. Of these training courses, only 22 (or 12 percent) were clearly ES&H core courses, while another 55 (or 24 percent) were ES&H-related courses (e.g., Quality Assurance).

Finally, the Management Subteam also identified that DOE/NPOSR-CUW does not monitor to ensure that JBEC and its subcontractors are meeting ES&H training requirements, as required by DOE 5482.1B "Environment, Safety, and Health Appraisal Program." (See Concern TC.1-4.)

Cross References
Findings MF-6, MF-14, A/CF-1, A/CF-2, A/CF-5, A/BMPF-1, SW/CF-1, SW/CF-2, SW/CF-4, SW/CF-6, SW/CF-7, GW/CF-3, WM/CF-1, TCM/CF-1, TCM/CF-3, QA/CF-5, QA/CF-10, QA/CF-11, IWS/CF-1, IWS/CF-3, IWS/CF-4, NEPA/CF-1, NEPA/CF-2, NEPA/CF-3, and NEPA/CF-4; Concerns OA.1-6, EP.3-2, and TC.1-4

Self-Assessment
This finding was fully identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal
This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was fully identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

FINDING MF-12

JBEC Human Resources Management

The JBEC recruiting and career management programs at NPOSR-CUW do not ensure continuity of staff qualified to effect complete implementation of environment, safety, and health (ES&H) program requirements.

Discussion

DOE 5480.19 "Conduct of Operations" (July 9, 1990), Chapter 1 cites the importance of the compatibility of operational and ES&H goals. Moreover, the guidelines for "Operations Organization and Administration" in this Order (Chapter I, Section C.2) stipulate the need for proactive human resources management to achieve these goals. The observations cited below pertain to deficiencies in JBEC human resources management practices that impede the achievement of these goals.

- JBEC has no formalized career path planning program that provides staff with opportunities for ES&H vocational development and growth. The small size of the JBEC (Casper) operation complicates the establishment of this type of human resources management program, but the maximum practical effort is needed to ensure that qualified employees have the opportunity to develop ES&H expertise and to use this enhanced capability to advance their careers.

- JBEC has no formalized program to identify individuals for succession to higher level management positions. Discussions with JBEC management did indicate, however, that an initiative is being formulated to develop future executive managers through a system of identifying personnel with high potential and then providing them with the training and experience to enhance their career opportunities.

- JBEC has not used all of its corporate resources in conducting its ES&H recruiting activities, although JBEC has on several occasions contacted JBEC Houston, the corporate office, for support in filling certain environmental positions on a temporary basis. This process is not, however, currently formalized in Policy and Procedure I.6-06, "Recruiting Additional or Replacement Personnel."

Cross References
Concerns OA.6-2 and TC.10-1

Self-Assessment
This finding was fully identified in the JBEC self-assessment (April 1992).

Management Appraisal
This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was fully identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).
FINDING MF-13
JBEC Environment, Safety, and Health (ES&H) Training Program

JBEC has not implemented a formal, effective, and comprehensive ES&H training program.

Discussion

DOE policy calls for adequate training in all activities for which it is required. DOE 5480.19 "Conduct of Operations" (July 9, 1980), for example, emphasizes both management training (Chapter I, Section C.5) and on-shift training (Chapter V). In the ES&H area, training of all personnel on the subject fundamentals and on practices to be followed is a vital component of program implementation. The Management Subteam observed a number of deficiencies in the JBEC ES&H training program, the most salient of which are given below.

- The JBEC Training Specialist has had the responsibility of developing and implementing a comprehensive training program, with special emphasis on ES&H, since January 1992. In an appraisal interview, the Training Specialist stated his intention to prepare an integrated plan for implementing the proposed enhanced training program. Thus far, however, this plan has not been issued, and no firm schedule for its preparation has been established.

- According to the Training Specialist, activities to date have been reactive, responding to immediate needs, rather than proactive in developing a comprehensive training program.

- Currently, JBEC training activities are decentralized and fragmented, in that both the Safety and Health Section and the Personnel Section coordinate ES&H-related training (i.e., the Personnel Section for offsite training and the Safety and Health Section for onsite training). Each group maintains separate training records, although the Training Specialist in the Safety and Health Section does input to the Personnel Section training records system.

- Not all JBEC employees at Naval Petroleum Reserve Number 3 (NPR-3) receive Occupational Safety and Health Administration (OSHA) training appropriate to their needs, as specified in 29 CFR 1910 and 29 CFR 1926. (See Concern TC.4-1.)

- Safety meetings are used to provide occupational safety training; however, training record sheets, which are designed to provide a record of attendance by the individual training topic, are not well documented. (See Section 4.5.5.)

- JBEC does not currently provide supervisor or management development training (as required by DOE 5480.19, Chapter I, Section C.5). This type of training had been provided to new supervisors before 1985, and again in 1990.

- Currently, JBEC does not perform quality assurance appraisals of the ES&H training functions. The new Quality Assurance Plan calls for this activity once the JBEC Quality Management Section is mobilized to fulfill this responsibility. Through a formalized process as part of its self-assessment program, JBEC will be able to evaluate the effectiveness of ES&H training activities; however, this evaluation is not scheduled to be initiated until mid-FY 1999.

- JBEC ES&H staff take environmental samples without adequate training in sampling techniques or methodology. Formal training in standard methods for environmental sampling is not being conducted. (See Finding MF-18.)

- Staff training on self-assessment procedures and on the Self-Assessment Implementation Plans (SAIPs) has not been conducted by JBEC. JBEC has addressed the need for self-assessment training in their Self-Assessment Program Plan, but no schedules or milestones for conducting this training have been developed. The personnel involved in preparing the self-assessment reports and the SAIPs are knowledgeable of the process; however, this information has not been adequately communicated to all staff members. As a result, the Self-Assessment Program is not formally institutionalized within each organizational unit, and participation in the self-assessment process by all levels of responsibility has been deficient.

Cross References


Self-Assessment

This finding was fully identified in the JBEC self-assessment (April 1992).

Management Appraisal

This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was fully identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).
FE and DOE/NPOSR Environment, Safety, and Health (ES&H) Oversight

FE and DOE/NPOSR oversight of ES&H programs and activities at NPOSR-CUN lacks sufficient definition and formality to ensure timely and proper implementation of DOE directives, other ES&H regulations, and DOE initiatives directed at achieving ES&H excellence.

Discussion

The Secretary of Energy has clearly assigned the responsibility for ensuring that program objectives are achieved in full compliance with applicable ES&H regulations and DOE policies and for achieving excellence in ES&H matters to line program management. This responsibility is carried out through various policies, systems, and activities at each management level from the Program Secretarial Officers down to subcontractor management. The development, communication, and application of these policies, systems, and activities collectively constitutes oversight of ES&H. Oversight elements for this assessment include the following:

- guidance and direction;
- reviews, appraisals, and evaluations; and
- management information systems.

Significant improvements in the amount and quality of oversight of field ES&H programs and activities by FE and NPOSR have been made in 1992. The DOE Office of Self-Assessment (FE-6) has now been staffed, has issued formal Self-Assessment Program Plans, and has performed management appraisals of ES&H programs in DOE/NPOSR and NPOSR-CUN. FE-6 also initiated a meeting of FE and field ES&H counterparts, scheduled for later this summer, which is designed to enhance communication and the understanding of ES&H issues. DOE/NPOSR hired an Environmental Specialist in the Office of Planning and Technical Assurance in March 1992. This Environmental Specialist has conducted an internal appraisal of DOE/NPOSR and Management Appraisal and validation and verification appraisals of corrective actions taken at NPOSR-CUN. These appraisals have been conducted in accordance with detailed, written plans and resulted in formally documented reports. However, the general lack of formality in management approach and a failure to fully integrate ES&H into all FE Headquarters units adversely affects the achievement of excellence in ES&H within DOE/NPOSR and at NPOSR-CUN. Specific deficiencies include the following:

- Roles, responsibilities, and authorities are not clearly defined and communicated. Interviews with DOE personnel indicated that a philosophy of individual responsibility for ES&H has been informally communicated from the Assistant Secretary for Fossil Energy and the Director, DOE/NPOSR. This is reflected somewhat in the importance attached to Total Quality Management down through the organization. However, FE-6 and the DOE/NPOSR Office of Planning and Technical Assurance (FE-64) Environmental Specialist are tasked with, essentially, all specific responsibilities for ES&H at FE and NPOSR. ES&H roles, responsibilities, and authorities for other organizational elements are not yet clearly defined and communicated. The mission and function statements and position descriptions for FE-6 and FE-64 describe ES&H roles, responsibilities, the roles, and authorities. However, the roles, responsibilities, and authorities for development and maintenance of ES&H elements, such as a Quality Assurance Program or training within these offices, are not delineated. In addition, the roles, responsibilities, and authorities of these two organizations and the interfaces between various FE, DOE/NPOSR, and DOE/NPOSR-CUN organizations regarding ES&H matters have not been formally or clearly communicated to all personnel. The role of the NPOSR National Environmental Policy Act (NEPA) Compliance Officer is detailed in the FE-64 Mission and Function Statement, but the position description of neither the FE-64 Office Director nor the Environmental Protection Specialist indicates a role as NEPA Compliance Officer. The person acting as the FE NEPA Compliance Officer is located in the FE-4 office, although the Mission and Function Statement does not indicate this to be so.

- Neither FE nor DOE/NPOSR have a formal, centralized training plan or program, nor have they designated individuals or organizations responsible for a training plan. Responsibilities for ES&H training are not formally defined. Oversight of field organization ES&H training programs is limited to the appraisals done by FE-6 or the Environmental Specialist. ES&H training for FE and DOE/NPOSR personnel is minimal; of 48 courses attended by DOE/NPOSR personnel in 1991 and 1992, only 1 was clearly ES&H related.

- Neither FE nor DOE/NPOSR have a formal directives system to ensure adequate review of DOE Orders and Secretary of Energy Notices, communication of expectations to subordinate organizations (FE to DOE/NPOSR or DOE/NPOSR to DOE/NPOSR-CUN), or tracking and followup to assure that appropriate and required actions have been taken. DOE directives are generally forwarded to subordinate organizations without guidance or direction as to expectations or need for formal responses regarding implementation of specific directive requirements. An example of a consequence of this lack of formality is that specific guidance on the DOE self-assessment initiative was not provided to DOE/NPOSR-CUN until December 1991, long after the need for self-assessment programs and activities were established by the Secretary. Another example is that no specific guidance or expectations for implementation (i.e., submittal of an applicability matrix, or response regarding status) was given to DOE/NPOSR or the site regarding Conduct of Operations, a program directed by Secretarial guidance in December 1989 and by DOE 5480.19, "Conduct of Operations Requirement for DOE Facilities" (issued in July 1990). DOE/NPOSR did issue memoranda to the site alerting it to the need for developing a self-assessment program on July 25, 1991, and the need for developing a formal conduct of operations plan on October 25, 1991. However, neither of these documents provided specific guidance or required any response from the site.

- Neither FE nor DOE/NPOSR have a formal, functioning corrective action program in place to track to closure ES&H deficiencies.
Identified by the DOE staff or external oversight organizations. Although not clearly delineated in the Office of Fossil Energy Self-Assessment Program Plan, the intent, as stated by FE-6 and DOE/NPOSR personnel, is to have one integrated, comprehensive tracking system accessible to all levels of the FE organization, including the contractors.

- Neither FE nor DOE/NPOSR have procedures or commitment tracking systems to provide the formality and consistency needed to assure that their programs and activities related to ESH are conducted in accordance with DOE Orders and that proper ESH oversight of subordinate organizations’ operations are exercised.

Cross References
Inadequacies in the oversight of ESH programs and activities at NPOSR-CUII are factors in many of the Tiger Team Assessment concerns and findings. Of particular note are Concerns OA.1-2 and OA.2-2.

Self-Assessment
This finding was partially identified in the DOE/NPOSR Internal Appraisal (June 1992). However, there has been no self-assessment of FE.

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of DOE/NPOSR (July 1992).

Finding MF-15
DOE/NPOSR-CUII Environment, Safety, and Health (ESH) Oversight of JBEC

The oversight program and activities of DOE/NPOSR-CUII are not adequately defined, developed, staffed, implemented, or documented to provide assurance that JBEC programs and activities are in compliance with ESH regulations and DOE directives and that DOE ESH initiatives are being properly addressed.

Discussion
The Secretary of Energy has clearly assigned the responsibility for ensuring that program objectives are achieved in full compliance with applicable ESH regulations and DOE policies and for achieving excellence in ESH matters to line program management. This responsibility is carried out through various policies, systems, and activities at each management level from the Program Secretarial Officers down to subcontractor management. The development, communication, and application of these policies, systems, and activities collectively constitutes oversight of ESH. Oversight elements for this assessment include the following:

- guidance and direction;
- reviews, appraisals, and evaluations; and
- management information systems.

DOE/NPOSR-CUII is the first line DOE organizational element performing oversight at NPOSR-CUII, with the most access and intimate knowledge of contractor performance. Formal oversight of JBEC activities by DOE/NPOSR-CUII regarding ESH performance has primarily been through the Cost Plus Award Fee evaluation process and contractor ESH program assessments performed by external organizations. Environmental oversight was the responsibility of the award fee functional monitor (a collateral duty) until September 1991 when the responsibility was passed to an individual reassigned to a new position entitled “Environmental Specialist.” Safety and health oversight responsibility has been delegated to the Director, Contract Surveillance and Administration with field surveillance input from the engineering staff and the Environmental Specialist. Quality assurance responsibility is assigned as a collateral duty to a member of the engineering staff. Most of the essential elements of an effective oversight program either do not exist or are informally established and implemented. Deficiencies in the DOE/NPOSR-CUII oversight program and activities involve inadequate organization, staffing, and training; informality of processes and lack of documentation; lack of a directives system; and the lack of management information systems. Specific deficiencies in each of these areas are as follows:

- The ESH organizational structure does not provide for internal oversight assessment by persons that are independent of technical direction or involvement in the activity being assessed. The organization also has direct conflicts of interest for the areas of safety and health and quality assurance in that personnel responsible for oversight also have program responsibilities (i.e., cost, schedule, and production). Personnel performing ESH duties are not ESH professionals by education or experience, and
supplemental ESH training for this staff has been very limited. (See Finding MF-11.)

- Oversight activities have been conducted in an informal manner. No written procedures exist to describe the ESH oversight program or its implementation. Safety and health field assessments are unplanned, unstructured, limited in number (findings are primarily random observations made during technical or production-related field visits), and no ESH program-type assessments have been made by site personnel. Prior to the spring of 1992, ESH concerns were not consistently or formally documented, transmitted/distributed, tracked, reviewed for proper corrective action, or verified as closed. In general, there are no formal requirements established for DOE review and approval of contractor documents with regard to ESH. The DOE/NPSR-CUW staff tasked with ESH responsibilities do not review proposed engineering changes to facilities, construction of new facilities, or work authorizations to ensure that all appropriate ESH criteria or considerations have been included.

- DOE/NPSR-CUW has not performed functional or triennial management appraisals of JBEC as required by DOE 5482.1B, "Environment, Safety, and Health Appraisal Program." Although certain functional areas have been appraised by external organizations, there has been no formal planning or scheduling of appraisals to comply with DOE 5482.1B until the May 1992 issuance of the DOE/NPSR-CUW Self-Assessment Program Manual. The scheduling of appraisal of the contractor provided in this manual, if properly implemented, should satisfy the requirements of DOE 5482.1B.

- DOE/NPSR-CUW does not have a formal or fully functioning directive system in place. DOE does not have a written procedure describing the processing of DOE directives or communicating expectations and requirements to the contractor, although the need for such a procedure has been identified, and one is currently being drafted. The DOE Site Office recently conducted a review of DOE directives and issued compliance letters to JBEC concerning the applicability of Orders and Secretary of Energy Notices (SEMs). As of June 15, 1992, letters had been sent to JBEC for approximately 75 percent of these directives. While this communication was necessary and commendable, the letters varied greatly in the level of guidance and did not require specific responses or actions where appropriate.

- DOE/NPSR-CUW does not have a formal, functioning corrective action program in place to track to closure ESH deficiencies identified by DOE staff or external oversight organizations.

- DOE/NPSR-CUW does not have a commitment tracking system for either incoming or outgoing correspondence.

DOE/NPSR-CUW has not identified ESH performance indicators and does not perform any formal trend analysis. DOE/NPSR-CUW has drafted DOE/NPSR-CUW Self-Assessment Program Standard Operating Procedure (SAP-SOP)-7 describing a trend analysis program for self-assessment findings.

Cross References

Inadequate oversight of JBEC programs and activities by DOE/NPSR-CUW was a factor in many of the Tiger Team findings (e.g., MF-11) and concerns.

Self-Assessment

This finding was fully identified in the DOE/NPSR-CUW self-assessment (April 1992).

Management Appraisal

This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPSR-CUW (June 1992) and was fully identified in the DOE/NPSR Office of Planning and Technical Assurance management appraisal of NPSR-CUW (May 1992).
FINDING MF-16

DOE/NPSOR-CUIW Contract Administration

DOE/NPSOR-CUIW has not enforced the provisions of the Scope of Work requirements related to environment, safety, and health (ES&H) and quality assurance (QA) in the contract between DOE/NPSOR and JBEC Houston.

Discussion

The ES&H requirements set forth in Contract No. DE-AC01-86SF00986 between DOE/NPSOR and JBEC are excellent and go well beyond the requirements of the standard Safety and Health Clause included in most management and operating contracts. They set forth specific requirements and deliverables, as well as schedules which clearly identify DOE expectations with respect to the ES&H program to be established by the contractor. To further emphasize the importance of these requirements, they were included in the Scope of Work statement which afforded them equal status with operational requirements. Quality requirements were also separately identified in the Scope of Work statement. Although they are less specific in terms of deliverables and schedules, they do identify the essential elements, including reporting requirements of the QA program, which the contractor was expected to develop and maintain. Since DOE does not currently have a standard contract clause applicable to environmental requirements, the provisions included in the Scope of Work provided an excellent means of defining the DOE/NPSOR expectations and requirements.

The DOE/NPSOR contract has been assigned to DOE/NPSOR-CUIW for administration and technical direction within specified limits. The Scope of Work, as set forth in Attachment A, required the contractor to prepare and submit for approval by the Director, NPSOR-CUIW, an Environmental Protection Plan and a Health and Safety Plan within 90 days after the effective date of the contract. The approved plans were also to be updated at least annually. The professional safety and health staff of the contractor is also required to conduct documented inspections of all activities at least annually and submit a report to the Director, NPSOR-CUIW citing all identified deficiencies and the corrective actions to be taken. Although the current contract was effective October 1, 1986, the contractor has not completed any of those required actions. Similarly, DOE/NPSOR-CUIW has not taken any action to enforce the mandatory provisions of the contract even though the "Compliance Directive" which is included in the Environmental Protection section, as well as the Scope of Work for Safety and Health, specifically identifies the actions to be taken by the Director, NPSOR-CUIW, or his authorized representative, in the event the contractor fails to comply with these requirements.

If the required actions and deliverables for ES&H and QA as set forth in the Scope of Work statement had been completed in a timely manner, it seems likely that many of the findings and concerns identified by the Tiger Team would have been resolved or at least minimized. Although the Cost Plus Award Fee records were not examined for the entire term of the contract, it does not appear that the failure on the part of the contractor to comply with the Scope of Work requirements specifically set forth in the contract was fully considered by DOE/NPSOR-CUIW in evaluating and rating overall contract performance. (See Findings MF-15 and MF-19; Concern OA.1-3.)

In addition to its failure to fully enforce the requirements set forth in the Scope of Work, DOE/NPSOR-CUIW approved the standard terms and conditions for JBEC purchase orders and subcontracts even though the required safety article had not been included in the proposed subcontracts for construction. Subsequent Contractor Procurement Systems Reviews by DOE failed to detect this omission.

Cross References

Findings MF-15 and MF-19; Concern OA.1-3

Self-Assessment

This finding was not identified in the DOE/NPSOR-CUIW self-assessment (April 1992).

Management Appraisal

This finding was not identified in the DOE Office of Self-Assessment management appraisal of NPSOR-CUIW (June 1992) and was not identified in the DOE/NPSOR Office of Planning and Technical Assurance management appraisal of DOE/NPSOR-CUIW (May 1992).
FINDING MF-17  Cost Plus Award Fee Process

The Cost Plus Award Fee (CPAF) process, as implemented at DOE/NPOSR-CUW, has not been fully effective in communicating ES&H expectations and goals to all JBEC management levels and gathering and evaluating ES&H performance data, and does not act as a fully effective incentive tool to promote ES&H performance.

Discussion

JBEC manages and operates NPOSR-CUW under a prime contract with DOE which uses a Cost Plus Award Fee mechanism. DOE Notice 4220.3 "Award Fee Contracts," (currently being revised) states that the process "should clearly delineate and effectively communicate to the contractors appropriate milestones and performance objectives for the upcoming rating periods." In doing so, DOE can translate ES&H goals and priorities into performance expectations. ES&H performance against the objectives and criteria in the Award Fee Determination Plan (AFDP) should be monitored on a continuous basis so that a comprehensive fee determination may be made following the performance period. Further, the CPAF process is designed to provide an incentive to achieve optimum contract performance by enabling the contractor to earn an increased fee as a reward for desired performance.

At NPOSR-CUW, ES&H objectives and criteria currently receive 25 percent of the stated weight in the AFDP. DOE/NPOSR-CUW recently recommended that the percentage be increased to 30 percent of the available award fee. This allocation appropriately reflects ES&H as a priority at NPOSR-CUW since this weight is greater than or equal to other performance categories.

Moreover, DOE/NPOSR-CUW has taken steps to enhance ES&H considerations in the CPAF process at NPOSR-CUW and has made an effort to improve interaction with JBEC through the ES&H Committee (PEC) by inviting it to participate in monthly performance Evaluation Committee (PEC) meetings. However, the CPAF process at NPOSR remains deficient in some areas.

Communication of Goals, Priorities, and Expectations

The ES&H performance objectives and criteria in the AFDP are generally broad and subjective in nature. A balance between objective and subjective criteria is lacking. The lack of objective and measurable criteria and milestones, where appropriate, hampers the AFDP from effectively communicating to the contractors what is expected in the way of performance. This deficiency also makes it difficult for performance monitors and evaluators to collect information and characterize ES&H performance using the established criteria.

The AFDP lacks adequate and comprehensive ES&H programmatic criteria necessary for a thorough evaluation of ES&H performance. For example, the current AFDP does not contain criteria pertaining to the National Environmental Policy Act program, environmental training, or compliance requirements related to DOE environmental orders. The programmatic criteria that do exist lack specificity, clarity, and schedules/milestones.

DOE/NPOSR-CUW has not fully developed the potential of the CPAF system to serve as a management tool to communicate the changes and new initiatives which have been generated in recent years. Although the weighting has been appropriately changed, the actual criteria related to the desired changes continue to lack sufficient specificity to serve as a standard to measure performance and results.

The Office of Environment, Safety and Health (ES&H) has commented several times in the past (August 1990, February 1991, and August 1991) that the criteria were not adequate. ES&H has also provided guidance to JBEC in "Safety and Health Programs Guidance" and "General Comments," February 1991) for improving their ES&H criteria. While DOE/NPOSR-CUW has recently recommended some changes to the safety and health criteria, they did not incorporate this guidance into past AFDPs.

The absence of appropriate ES&H criteria limits the ability of DOE/NPOSR-CUW to effectively communicate clear and concise ES&H goals and objectives to JBEC through the AFDP.

Additional ES&H priorities and goals are often provided on a verbal basis to JBEC, which does not provide a documented record for evaluation of performance. JBEC has recognized this problem, but has failed to request written documentation of such guidance in a formal manner.

Incentive System

DOE/NPOSR-CUW has not fully used the award fee process as an effective incentive tool to promote ES&H excellence. Although on occasion a specific incentive was assigned to a particular ES&H initiative, this practice has not been consistently applied to promote ES&H performance. DOE/NPOSR-CUW has made an effort to correct potential deficiencies using the process, but has not extended that effort to promote new initiatives and ES&H programs. A review of several monthly PEC reports revealed over 40 items related to the correction of specific deficiencies while only five were directed to the development of ES&H programs or initiatives. While the correction of deficiencies is an important component of the process and should continue to be, the process should also provide an incentive to pursue new developments. Additionally, DOE/NPOSR-CUW does not characterize expectations and formally communicate them to JBEC.

Process Mechanisms

The timely, comprehensive, and accurate collection and evaluation of ES&H performance data are crucial to an effective award fee process. At NPOSR-CUW, there are some deficiencies in the CPAF process that are not conducive to the achievement of these objectives. Neither NPOSR nor DOE/NPOSR-CUW provide specific guidance on ES&H performance or the procedures for the collection of ES&H performance information as inputs into the CPAF process. The lack of such guidance is especially critical at NPOSR-CUW because of the deficiencies cited earlier in regard to the performance objectives and criteria. This problem is compounded by the fact that some personnel responsible for collecting and evaluating ES&H performance data in connection with the CPAF process lack the formal training and experience in ES&H requirements and issues.

Further, there are no structured programmatic ES&H assessments or evaluations conducted in connection with the CPAF evaluation. While occasional audits performed by external groups have been incorporated into the CPAF, the bulk of performance information that is used in the evaluation is often event driven, such as incidents that are discovered by DOE/NPOSR-CUW monitors. The lack of
evaluation of individual ES&H programs makes it difficult to perform a complete evaluation of ES&H activities for the entire rating period. This situation is compounded by the limited and irregular DOE/NPOSR-CUW ES&H presence on site which limits their capability to gather performance data in the ES&H area.

DOE/NPOSR-CUW does not have a formal tracking system for the corrective actions taken by JBEC to address deficiencies identified in the CPAF process. While some informal tracking is done at the Performance Evaluation Committee level, the absence of formal programs limits the effectiveness of the process as a performance improvement tool. DOE/NPOSR-CUW has not developed a formal lessons learned program in relation to deficiencies and achievements identified in the CPAF process.

Cross References
Findings MF-4 and MF-15

Self-Assessment
This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of DOE/NPOSR (July 1992), was partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992), and was partially identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

FINDING MF-18
JBEC Environment, Safety, and Health (ES&H) Oversight

The oversight program and activities of JBEC are not adequately defined, developed, staffed, implemented, or documented to provide assurance that JBEC ES&H programs and activities are in compliance with DOE directives and other regulations or that DOE ES&H initiatives are being properly addressed.

Discussion
The Secretary of Energy has clearly assigned the responsibility for ensuring that program objectives are achieved in full compliance with applicable ES&H regulations and DOE policies and for achieving excellence in ES&H matters to line program management. This responsibility is carried out through various policies, systems, and activities at each management level from the Program Secretarial Officers down to subcontractor management. The development, communication, application of these policies, systems, and activities collectively constitutes oversight of ES&H. Oversight elements for this assessment include the following:

- guidance and direction;
- reviews, appraisals, and evaluations, and
- management information systems.

JBEC, as the management and operating contractor at NPOSR-CUW, has responsibility for operational activities and, thus, has the best opportunity, as well as the contractual responsibility and obligation, to exercise comprehensive ES&H oversight of these operations. Formal ES&H oversight within JBEC at NPOSR-CUW has primarily been the responsibility of designated ES&H specialists in staff environmental and safety and health organizations reporting to the General Manager. Documented safety inspections of equipment have been performed by line management and workers for years. In addition, the line management responsibility for ES&H is currently being more formally communicated to the line through new mission statements (issued), new unit charters (being drafted), revised job descriptions (being drafted), and employee performance evaluation standards (issued, but inadequate; see Finding MF-9). Most of the elements of an effective oversight program exist or are being developed within JBEC. Enhanced ES&H staffing, surveillance, and personnel involvement in safety and health matters have occurred over the last 2 years. With the approach of the Tiger Team Assessment, several major program appraisals were conducted by both in-house staff and external appraisers. Significant attention has been directed at major ES&H program elements, such as conduct of operations and quality assurance in the last few months.

However, ES&H oversight by JBEC in some areas has been nonexistent or insufficient, and in many areas is poorly documented and lacks adequate follow-through for identified deficiencies. Some key elements of an effective oversight program have not yet been developed or implemented by JBEC. Deficiencies in the JBEC/NPOSR-CUW oversight program and activities include inadequate organization, staffing, and training; informal processes and lack of documentation; inadequate procedures; incomplete implementation of a
directives system; and the lack of (or inadequate) management information systems. Specific deficiencies in each of these areas are as follows:

- For the JBEC Safety and Health and Environmental Sections, there is a lack of independence in that the personnel performing independent assessments are also responsible for providing technical support, guidance, and review. This question of independence has not been adequately addressed by JBEC. The JBEC Environmental Section has experienced significant turnover and staffing shortages. In the spring of 1992, JBEC brought in temporary personnel to fill the Environmental Manager position and provide supplemental technical expertise. Environmental oversight activities have thus been primarily reactive in nature. For example, the Environmental Section staff do not visit reported spill sites before cleanup or evaluate the accuracy of spill reports. They do not evaluate the appropriateness or adequacy of preventative actions to prevent recurrence for spills and leaks. The Management Subteam reviewed several completed and approved 1991 spill and leak reports and noted that the blocks for specifying actions to prevent recurrence were sometimes blank, were sometimes not annotated as complete, and were sometimes incorrectly noted as complete when, in fact, actions had not been taken or were not verifiable.

In general, ES&H training for the ES&H staff or other JBEC personnel has not been given high priority or funding. JBEC ES&H initiatives have not been given high priority or funding. JBEC ES&H personnel responsible for environmental sampling lack training in site-specific environmental sampling techniques, and there are no formal site procedures detailing this activity. (See Finding MF-13.)

- Weaknesses exist in the JBEC management system for Policies and Procedures (P&Ps). JBEC has a formal system for P&Ps, but a clearly documented policy of documents has not been established. P&Ps are combination Policy and Procedure documents, although some P&Ps are strictly policy statements; the distinction between a P&P and an Operation Procedure has not been defined; and desk procedures or Standard Operating Procedures (SOPs) have not been defined. Policy and Procedure 5-4-01, "Procedure Preparation and Distribution" (June 8, 1992), allows new or revised procedures to be accumulated for up to 3 months prior to formal publication. A new Quality Assurance Manual (awaiting DOE approval) establishes a hierarchy of procedures, but still does not identify policies in that hierarchy, and it is not yet clear how this Manual will be implemented with regard to site procedures.

JBEC does not have a clear, written policy or procedure for the use of procedures (e.g., strict adherence, "out and in use" at the work location, and change all errors formally before proceeding) or for making emergency or minor changes. Policy and Procedure 5-4-04, "Reviewing, Revising and Deleting Published Procedures" (June 8, 1992), permits JBEC personnel to mark up a copy of an incorrect P&P for "temporary use" while a change is being processed; supervisory and ES&H staff reviews and approval are not required.

- JBEC Environmental Section P&Ps are out of date (i.e., they reference old organizations, personnel, and telephone numbers) and, in general, inadequately address key elements such as the frequency and scope of assessment activities, the means of documenting deficiencies, and the processing of identified deficiencies (e.g., distribution, tracking, designation of responsible parties, reporting of completion of corrective actions, verification and closure, and trend/root cause determination).

JBEC has not developed formal programs or procedures for the environmental functional areas of air quality and waste management which are specified in Policy and Procedure 1.5-01, "Environmental Policy."

JBEC Safety and Health Policies and Procedures, although in better condition than Environmental P&Ps, also inadequately address key elements such as the frequency and scope of assessment activities, the means of documenting deficiencies, and the processing of identified deficiencies.

- ES&H deficiencies are not consistently documented, distributed, tracked to closure, assigned for corrective actions, verified as complete, trending, or evaluated for root cause or generic conditions. In April 1992, JBEC developed and implemented a safety and health deficiency tracking system (outlined in Policy and Procedure 1.3-40, "Safety and Health Department Tracking Program," issued June 9, 1992) which consolidated and enhanced existing informal tracking systems. Environmental issues are tracked by various, mostly informal Environmental Section tracking systems. Although a comprehensive corrective action system is now under development, it is not yet functioning. The Management Subteam notes that JBEC intends to input the findings from site internal and external audits into the new corrective action system and perform verification of adequate corrective action. This aggressive and proactive approach should provide additional assurance that previously noted deficiencies have been addressed.

- JBEC does not have a fully functioning directives system in place. A new JBEC procedure detailing the review and processing of DOE directives was issued on May 29, 1992. A backfit review of DOE Orders and Secretary of Energy Notices is in progress, but the applicability of DOE Orders and other regulations is being reviewed with respect to the level of compliance by JBEC. As a result, many JBEC organizational elements are attempting to develop or enhance the site ES&H program without a full understanding of the requirements and guidance provided in DOE directives.

- JBEC does not have a written commitment tracking system, although a system is being maintained by the General Manager's clerical staff. However, recently issued DOE/NPOSR-CUW and JBEC management policies authorizing formal correspondence directly between staff members which communicate DOE expectations and JBEC
commitments have not been factored into the existing commitment tracking system. Thus, the potential exists for expectations and commitments to bypass the tracking system and thus avoid the attention of management.

- JBEC has not fully identified ES&H performance indicators and does not perform any formal trend analysis of ES&H deficiencies. JBEC has no written procedures for a performance indicator/trend analysis program. JBEC has collected standard performance indicator information as directed by SEN-29-91 for four quarters and has also identified a number of additional site-specific performance indicators. However, these indicators have been reported directly to DOE without any narrative or analysis and there is no evidence that they have been utilized as a management tool for change.

- The JBEC oversight of ES&H for subcontractors is lacking in formality and consistency. The extent and responsibilities for communication between contract administrators, Contracting Officer Technical Representatives (COTRs), and the ES&H technical staff are not clearly delineated in procedures. COTRs do not appear to be actively involved in assessing subcontractor performance in the ES&H areas as required by Policy and Procedure 1.5-03, "Subcontractor Environmental Monitoring" (March 10, 1992), and Policy and Procedure 1.3-32, "Subcontractor Safety Monitoring" (May 27, 1992), and documentation methods do not accommodate these reviews. Formal notification of ES&H staff that subcontractors are onsite and need site-specific ES&H training is not formal and does not routinely occur. Subcontractor Quarterly Performance Evaluations do not contain any Environmental Section performance elements. Two 1991 Quarterly Performance Evaluation reports for one subcontractor indicated satisfactory safety performance when, in fact, JBEC ES&H staff and management had identified numerous safety violations on several occasions and unacceptable safety attitudes by site supervision. In addition, during the evaluation period a letter had been written to the subcontractor threatening sanctions and removal from the site if safety performance was not improved. Performance Evaluation reports are not distributed to management or to the ES&H technical staff. JBEC Policy and Procedure 1.3-32 and Policy and Procedure 1.5-03 both require monitoring of subcontractors by the COTRs and the Environmental and Safety and Health Sections staff. However, neither provides any specifics as to frequency, checklists or items to inspect, documentation and communication of findings (good or bad), specification and review of corrective actions, verification/closure, or tracking and trending.

Cross References

Inadequate JBEC ES&H oversight was a factor in many of the Tiger Team concerns and findings (e.g., MF-9 and MF-13).

Self-Assessment

This finding was partially identified in the DOE/NPOSIR-CUW and JBEC self-assessments (April 1992).

Management Appraisal

This finding was fully identified in the DOE Office of Self-Assessment management appraisal of NPOSIR-CUW (June 1992) and was fully identified in the DOE/NPOSIR Office of Planning and Technical Assurance management appraisal of NPOSIR-CUW (May 1992).
FINDING MF-19  
JBEC Contract Compliance

JBEC has not fully complied with the mandatory environment, safety, and health (EESM) provisions of their contract with DOE/NPOSR.

Discussion

The Scope of Work in Attachment A of DOE/NPOSR Contract Number DE-AC01-86FE00989 identifies a number of specific requirements and deliverables related to EESM. Article 1 of the Environmental Protection section of the Scope of Work states, "The Contractor shall take all measures necessary to comply with all applicable federal, state and local environmental protection statutes, regulations and standards, and all applicable DOE Orders." It also states that the contractor must ensure that he is completely knowledgeable of and able to implement all such statutes and regulations.

Based on the number of findings identified by the Tiger Team, it is evident that JBEC has not fully complied with this provision of the contract.

Article 2 specifies, "The Contractor shall submit for approval in writing an Environmental Protection Plan to the Director, NPOSR-CUW within ninety (90) days after the effective date of the contract." It further states that the plan shall be updated, reviewed, and approved by DOE when necessary, but no less than annually. Although the contract became effective October 1, 1986, JBEC has not completed and submitted the Environmental Protection Plan or any subsequent updates.

Article 2 of the Safety and Health clause of the Scope of Work states, "The Contractor shall submit for approval, in writing, a Health and Safety Plan to the Director, NPOSR-CUW, within ninety (90) days after the effective date of the contract." The approved plan was also to be updated no less than once each year. JBEC has not completed and submitted the Health and Safety Plan or any subsequent updates.

Article 5 of the Safety and Health Clause states, "The Contractor’s professional safety and health personnel shall conduct documented inspections of all activities at least once each year." A copy of the report indicating all deficiencies found and corrective action taken or planned was to be submitted to the Director, DOE/NPOSR-CUW. According to JBEC personnel, these inspections have not been completed and reported as specified in the contract.

An external JBEC audit completed May 15, 1991, stated that JBEC is not meeting all of the reporting requirements set forth in the prime contract. However, JBEC management apparently made a unilateral decision to defer any action to comply with the contractual requirements pending a DOE decision to compete or negotiate a new contract.

The provisions of the contract and related DOE procurement regulations, which are also applicable to JBEC, require that the flowdown provisions of the Safety and Health Clause in the prime contract be included in all subcontracts and major purchase orders issued by JBEC. JBEC has included those provisions in the terms and conditions of all major procurement actions with the exception of those related to subcontracts for construction. Even though the terms and conditions for construction subcontracts were approved by DOE and subsequently reviewed during a Contractor Procurement Systems Review by DOE,

Cross References

Findings MF-16; Concerns OA.1-1 and OA.1-4

Self-Assessment

This finding was not identified in the JBEC self-assessment (April 1992).

Management Appraisal

This finding was not identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was not identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

the omission of the required article from construction subcontracts is a violation of the provisions of the prime contract.
FE and DOE/NPOSR have not developed and implemented QA programs as required by DOE 5700.6C. DOE/NPOSR-CUW has not fully developed implementing procedures or implemented a QA program as required by DOE 5700.6C.

Discussion

An effective QA Program is a key management system which helps provide structure, formality, and consistency to environment, safety, and health (ES&H) programs and activities. DOE Order 5700.6C, "Quality Assurance," requires DOE Departmental elements to develop and implement QA programs to govern the work of the organization.

FE and DOE/NPOSR have not developed or implemented QA programs as required by DOE 5700.6C. FE has not assigned responsibility for developing a QA program. In DOE/NPOSR, the responsibility for QA rests with the Office of Planning and Technical Assurance (FE-64), as evidenced in their Mission Statement and individual position descriptions. However, it is not clear from these documents whether a formal QA program is intended to be developed and maintained at DOE/NPOSR. Moreover, no formal plans have been established to develop a QA program for DOE/NPOSR. Neither FE nor DOE/NPOSR have formal procedures that detail the implementation of the QA program elements delineated in DOE 5700.6C.

A formal QA Program Manual was drafted for DOE/NPOSR-CUW, which has been approved locally and transmitted to DOE/NPOSR on June 6, 1992, for review and approval by the Assistant Secretary for Fossil Energy (FE-1). Some top-level implementing QA procedures (QAPs) have been drafted and are incorporated as part of the QA Program Manual, but no Standard Operating Procedures (SOPs) for implementing QA requirements have been developed. In addition, as a result of a brief review of the draft manual, the Management Subteam identified weaknesses in the following areas regarding the draft QAPs:

- The QAPs do not clearly require ES&H specialist (including QA) review of and concurrence to project plans or SOPs when appropriate.

- The need for preparing SOPs is weakly stated in QAP 5.1 as "They may be written when it seems prudent to provide workers written instructions." (emphasis added).

- Section 16 of the QA manual, entitled "Corrective Action," addresses only corrective actions related to QA audits or Nonconformance Reports and does not include routine corrective actions related to routine surveillances and inspections, appraisals, or findings from outside entities.

The Management Subteam notes that the lack of a formal QA program at NPOSR-CUW was identified by FE as early as 1983. A QA Program Implementation Plan was developed by the management and operating (M&O) contractor, Lawrence-Allison (merged into JBECS in 1989), and forwarded to DOE/NPOSR in 1984. The policies and procedures for a QA Program (called the QA Plan) were prepared by the contractor in March 1985 and approved for implementation by DOE/NPOSR-CUW in September 1985. However, implementing directives described in the implementation plan were never issued by DOE/NPOSR-CUW, and no DOE QA Program was established. In addition, the requirement to implement the QA Program as required by DOE 5700.6A, and the scope of work in the contract between DOE and JBECS, was never enforced by DOE. (See Finding MF-16.)

Cross References

Finding MF-16, QA/CF-3, and QA/CF-6; Concern QV.1-2.

Self-Assessment

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992) in that the lack of a sitewide QA program was identified. This finding, as it relates to FE and DOE/NPOSR, was not identified in the DOE/NPOSR self-assessment (July 1992).

Management Appraisal

This finding was not identified in the DOE Office of Self-Assessment management appraisal of NPOSR (July 1992), was not identified in the DOE Office of Self-Assessment management appraisal of NPOSR (June 1992), and was not identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

DOE/NPOSR Internal Appraisal

This finding was not identified in the DOE/NPOSR internal appraisal (June 1992).
FINDING MF-21

JBEC Quality Assurance (QA) Program

JBEC has neither developed implementing procedures nor implemented an approved QA Program as required by DOE 5700.6C.

Discussion

An effective QA Program is a key management system which helps provide structure, formality, and consistency to ES&H programs and activities. DOE Order 5700.6C, "Quality Assurance," requires DOE Departmental elements to develop and implement quality assurance programs to govern the work of the organization.

Existing JBEC Policies and Procedures and routine informal practices address many elements of a QA program at NPOSR-CUW in some manner. JBEC recently drafted a Quality Assurance Manual and forwarded it to DOE/NPOSR-CUW for review and approval by DOE (forwarded to FE-60 on June 16, 1992). This QA Manual contains some Quality Assurance Standards (QASs), which are top-level implementing procedures. However, few lower tier implementing procedures have been developed, and the requirements of the draft manual have not yet been fully implemented. The draft QA Manual addresses the elements of DOE 5700.6C through the application of the more rigorous American Nuclear Standards Institute/American Society of Mechanical Engineers (ANSI/ASME) NQA-1 requirements. It represents a significant amount of effort and with some exceptions should provide a solid foundation for the JBEC QA program at NPOSR-CUW. However, during a brief review of the draft QA manual, the Management Subteam identified weaknesses in the following areas:

- The QASs do not clearly require the advance review and concurrence of project plans and department procedures by ES&H specialists (including QA) when appropriate.
- The need for preparing department procedures is weakly stated in QAS 5.1 as "They may be written when it seems prudent to provide workers written instructions..." (emphasis added).
- Section 5 of the QA manual does not provide for adequate control of the document review and approval process with regard to coordination, setting of priorities, timeliness, resolution of conflicts, and retention of comments.
- The QA manual does not address the quality verification of work activities, only quality verification of reports/analyses and computer software programs.
- Section 16 of the QA manual, entitled "Corrective Action," addresses only corrective actions related to QA audits or Nonconformance Reports and does not include corrective actions resulting from routine surveillances and inspections, appraisals, or findings from outside entities.

Cross References

Finding QA/CF-3; Concern QV.1.1

Self-Assessment

This finding was partially identified in the JBEC self-assessment (April 1992) in that the lack of a fully implemented QA program was identified.

Management Appraisal

This finding was not identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was not identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).
FINDING MF-22

DOE/NPOSR-CUW Permits Issued to Private Industry

DOE/NPOSR-CUW has not taken steps to ensure that DOE environment, safety, and health (ES&H) standards and requirements are applied to privately owned facilities operating on DOE-owned lands under the provisions of a use permit.

Discussion

The Director, DOE/NPOSR-CUW, with the approval of the Director, DOE/NPOSR, issued a revocable, no fee permit to the Amoco Pipeline Company for the construction and operation of an 8-inch crude oil pipeline and pump station on government-owned land at the Naval Petroleum Reserve Number 3 (NPR-3). Although the permit was officially formalized and signed on April 4, 1980, the effective date was retroactive to February 1, 1978.

The privately owned pipeline and pumping station provides a means for DOE to sell crude oil from NPR-3 to private industry. The point of sale occurs at the Lease Automated Custody Transfer (LACT), where the product is metered before it enters the pipeline of the purchaser. Although the permit does contain an indemnity clause, the requirement for liability insurance was waived by DOE on the basis that the permittee is self insured.

Since the permit was issued several years ago, it does not contain or reference many of the ES&H provisions which would now be required. For example, the permit does not specify responsibilities for the environmental cleanup or restoration of any contamination which might result from a ruptured pipeline or a soil spill emanating from the pumping station or the monitoring of any potential long-term environmental effects. The Safety and Health Subteam observed that JBEC has not investigated or analyzed the potential risks associated with the pipeline. (See Concerns PT.6-3 and PT.6-4.)

Article 12 of the permit provides a mechanism for the Director, DOE/NPOSR-CUW to prescribe additional rules or regulations “from time to time” to be applied to the privately owned and operated facilities. However, there is no formal record of any attempt to ensure that the permittee has been advised of the enhanced DOE ES&H requirements which apply to all operational activities at DOE-owned facilities.

Cross References

Concerns PT.6-3 and PT.6-4

Self-Assessment

This finding was not identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal

This finding was not identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was not identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

FINDING MF-23

DOE/NPOSR-CUW Public and Institutional Interactions

DOE/NPOSR-CUW public and institutional interactions lack adequate formality to assure that effective public outreach, media relations, and regulatory interactions are conducted and that staff, at all levels of the organization, understand their responsibilities and authorities in these areas. FE-5 has not provided DOE/NPOSR with formal guidance pertaining to public and institutional interactions.

Discussion

DOE is dedicated to improving the quality of its relationships and interactions with external parties who are either interested in, or potentially affected by, DOE activities or who play an active role in the oversight of DOE operations. The development of public and community outreach policies and procedures promoting open, positive relationships with external regulatory bodies are all important components of a program to accomplish DOE’s objectives in this area.

DOE/NPOSR-CUW does not have a formal public outreach and community relations policy. DOE/NPOSR-CUW has not displayed a proactive approach to disseminating environmental, safety, and health (ES&H) information to the public on a regular basis nor has it aggressively solicited ideas and concerns from the surrounding communities. Moreover, DOE/NPOSR-CUW has not utilized community relations to promote its operations as a ES&H standard for the industry or as a valuable asset to the community. While some DOE employees are active in the community (e.g., making presentations at local schools on the history of the Teapot Dome), no cohesive, formal policy promoting or structuring such activities exists.

DOE/NPOSR-CUW also does not have a formal media relations policy in place to ensure that timely and responsive information is made available to the media. DOE/NPOSR-CUW has not assigned the responsibilities to a member of the organization so as to establish a focal point for media relations and policy.

DOE/NPOSR-CUW lacks an adequate policy concerning relationships with external regulatory agencies. DOE/NPOSR-CUW has delegated various responsibilities for interacting with regulatory agencies to JBEC and, in recent years, has delegated them increased authority to sign specific permits and reports (e.g., pit permits and permits to drill). The delegation of regulatory responsibilities to JBEC and the role DOE/NPOSR-CUW will play in these activities has not been clearly defined or documented in a policy or procedure. Similarly, the delegation of authority to interact with regulators within the DOE/NPOSR-CUW organization has not been clearly delineated in a formal policy or procedure. The lack of policies and procedures is evidenced by the submittal of the Discharge Monitoring Reports for NPR-3 for the January - June 1991 and July - December 1991 reporting periods without signatures (see Finding SW/CD-3). While the relationship between DOE/NPOSR-CUW and the regulatory agencies has been positive, the lack of formality prevents an institutionalized, consistent approach to regulatory interactions and leaves NPOSR-CUW vulnerable to potentially significant misunderstandings with the regulators.
FE has established the Office of Communications (FE-5) which is responsible for public and institutional interactions. While this office has acted as a resource for the FE field sites when specific questions concerning public and institutional interactions arise, FE-5 has not provided DOE/NPOSR-CUW with any formal guidance concerning the development and implementation of public outreach, media relations, or regulatory interaction policies or procedures. FE-5 is currently drafting a policy and procedure document that is intended to provide such guidance to the Field organizations; however, this document has not yet been approved or issued. This is at least partly attributable to the revisions being considered by the Department for DOE 1200.1, "Policies and Procedures for Departmental News Media Activities," which governs media activities. While FE-5 has taken positive steps in the area of public and institutional interactions, its assistance to the field has generally been reactive in nature and has lacked formality.

Cross References
Finding SW/CF-3
Self-Assessment
This finding was partially identified in the DOE\NPOSR-CUW self-assessment (April 1992).
Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of DOE/NPOSR (July 1992) and was fully identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal of NPOSR-CUW (May 1992).

FINDING MF-24
JEC Public and Institutional Interactions
JEC public and institutional interactions lack adequate formality to assure that effective public outreach, media relations, and regulatory interactions are conducted and that staff, at all levels of the organization, understand their responsibilities and authorities in these areas.

Discussion
DOE is dedicated to improving the quality of its relationships and interactions with external parties who are either interested in, or potentially affected by, DOE activities or who play an active role in the oversight of DOE operations. The development of public and community outreach policies, media relations policies, and policies promoting open, positive relationships with external regulatory bodies are all important components of a program to accomplish DOE's objectives in this area.

JEC does not have a formal public outreach and community relations policy or program. JEC has not displayed a proactive approach to disseminating ES&E information to the public on a regular basis nor has it aggressively solicited ideas and concerns from the surrounding communities. Moreover, JEC has not used community relations to promote its operations as a valuable asset to the community. While some JEC employees are active in the community, no cohesive, formal policy promoting or structuring such activities exists. JEC also does not have a formal media relations policy in place to ensure that timely and responsive information is made available to the media. While the contract contains a clear data release clause, JEC has not developed a formal policy that has been communicated to all levels of the organization. JEC also has not assigned media responsibilities to any member of the organization so as to establish a focal point for media relations and policy.

JEC lacks an adequate formal policy concerning relationships with external regulatory agencies. JEC, as operator of the NPOSR-CUW facilities has been delegated various responsibilities for interacting with regulatory agencies, and in recent years, has been delegated increased authority to sign specific permits and reports (e.g., pit permits and permits to drill). While some guidelines are provided in individual Policy and Procedures documents on individual responsibilities for interacting with regulators, JEC's delegated regulatory responsibilities have not been clearly defined or documented in a sitewide policy or procedure. Additionally, there have been instances where informal understandings are arrived at with regulators, which are not confirmed with written documentation. The North Waterflood discharge issue (see Finding SW/CF-2) is an example of such a situation. JEC lacks a formal policy or procedure that addresses the need for formal, written documentation of any such understanding. While the relationship between JEC and the regulatory agencies have been positive, the lack of formality prevents an institutionalized, consistent approach to regulatory interactions and leaves NPOSR-CUW vulnerable to potentially significant misunderstandings with the regulators.

Cross References
Finding SW/CF-2
Self-Assessment

This finding was partially identified in the JBEC self-assessment (April 1992).

Management Appraisal

This finding was partially identified in the DOE Office of Self-Assessment management appraisal of DOE/NPSR (July 1992) and was fully identified in the DOE/NPSR Office of Planning and Technical Assurance management appraisal of NPSR-CUW (May 1992).

SPECIAL ISSUE-NOSR-3

DOE responsibilities and requirements for the protection of environment, safety, and health (ES&H) have not been specifically set forth in the Standard Industry Operating Agreements for the development and operation of communitized natural gas wells at the Naval Oil Shale Reserve (NOSR) sites.

Discussion

In recent years, there has been a significant number of commercial natural gas wells developed along the boundaries of the DOE-owned NOSR sites in Colorado. To minimize drainage of the natural gas fields underlying the NOSR sites by private development, DOE developed a Communitization Program. Under the provisions of this program, DOE joined with other mineral interest owners to develop and operate wells near the boundaries of the NOSR sites. The owners agreed to develop the wells jointly and to share in the costs and revenues based on the acreage held by each partner within the unit which was being pooled for development.

The majority of the communitized wells are operated by privately owned firms and are located on lands of which DOE does not own the surface rights. However, in one case a communitized well is located on DOE land and is operated by a private firm under the provisions of a modified Standard Industry Operating Agreement. Although the development and subsequent operation of a producing well is generally the responsibility of the member that owns the greatest percentage of surface land in the designated area, that is not always the case. In some instances, DOE owns more than 50 percent of the well, but, for a variety of reasons, the private partner was chosen to develop and operate the well. In other cases, DOE/NPSR-CUW has chosen to serve as the operator, even though the well is located on privately owned land.

The development and operation of the communitized wells and the responsibilities of the parties are set forth under a modified Standard Industry Operating Agreement, similar to those which have been used for many years by the oil and gas industry for wells with joint ownership. Although the terms and conditions of those agreements reflect certain DOE contractual requirements, they do not contain many of the ES&H provisions which are generally incorporated into DOE contractual agreements.

The Tiger Team does not question the propriety of these contractual agreements or the importance of participating in communitized oil or gas wells to protect the financial interests of the U.S. Government. However, the Secretary of Energy has stated that ES&H programs will be developed for all elements of DOE which go beyond mere compliance with existing laws and regulations. DOE organizations, including all contractors and industrial participants, are expected to achieve a level of excellence in the development and application of environmental, as well as safety and health, programs which will serve as a model for other agencies and private industry. To achieve the Secretary's stated objectives, contractual or operating agreements with private industry, in particular, should place a strong emphasis on DOE's ES&H standards and requirements. DOE has a special obligation to apply these important principles to those programs associated with the development, marketing, or commercialization of the government-owned natural resources which have been entrusted to the Department. Great care must be exercised to avoid even the
potential perception that profitability motives or objectives have taken precedence over protection of the environment or public and worker safety.

It is in that context that the Tiger team believes there are some issues associated with the Communization Program which should be reexamined by DOE/NPOSR with the advice and support of the Office of General Counsel. These issues are presented below.

- DOE/NPOSR-CUII asserts that the communitized well located on DOE property is subject to all of the ES&H rules, regulations, and requirements of DOE. It further states that it is responsible for exercising oversight of the field activities to ensure that all such requirements are consistently applied. DOE is assisted by the Bureau of Land Management (BLM) under the provisions of a Memorandum of Understanding (MOU), wherein BLM assists DOE in the application and enforcement of National Environmental Policy Act requirements, preservation of antiquities, etc. (The Environmental Subteam noted that many of these required actions were not completed until the operational activities were well underway due to weather conditions at the field site.)

Since few, if any, of the special ES&H requirements of DOE are set forth in the terms and conditions of the current operating agreement between DOE/NPOSR and the industrial participant, there is some question as to the legal authority or responsibility of DOE to impose such requirements on the industrial participant even though the well is located on DOE land. Moreover, if those special DOE-imposed ES&H requirements should result in increased development or operating costs, the industrial participants may be unwilling to accept a proportionate share of the increased costs since the requirements were not set forth in the contractual operating agreement.

- A determination should be made as to whether DOE/NPOSR has a duty and responsibility to apply the full range of mandatory DOE ES&H requirements to the development and operation of the communitized wells located on privately owned or leased lands and, particularly, where DOE serves as the operator or owns more than 50 percent of the oil or natural gas rights.

- An examination should be performed of the financial liabilities of the government which might accrue from unexpected potential long-term environmental consequences. Additionally, a determination as to whether the liabilities are adequately bounded and protected by the terms and conditions of the modified Standard Industry Operating Agreements which are being applied and, particularly, for those wells located on privately owned or leased lands where the government will be entitled to less than 50 percent of the revenues.

The DOE/NPOSR action plan or response to the Tiger Team findings or concerns should address the following issues:

- The legal sufficiency of the current operating agreements to bound or protect the interests and liabilities of DOE in the event of long-term environmental consequences resulting from the development and operation of communitized wells on privately owned or leased lands.

- The duties, responsibilities, and authorities of DOE/NPOSR to impose the full spectrum of DOE ES&H requirements on the industrial participants for wells located on DOE-owned or privately owned or leased lands. Determine whether the provisions of the current operating agreements are adequate to enforce any such requirements which are determined to be applicable.

- The issue of how the parties would share in any additional costs resulting from such requirements, if DOE/NPOSR does have an obligation to apply the special ES&H requirements of DOE to all such operations.

If a decision is reached that DOE/NPOSR has a responsibility to apply all applicable DOE ES&H requirements to the communitized wells, an action plan will be required which reflects the actions to be taken and the planned completion dates.
6.0 EVALUATION OF SELF-ASSESSMENT PROGRAMS AND REPORTS FOR THE NAVAL PETROLEUM AND OIL SHALE RESERVES IN COLORADO, UTAH, AND WYOMING

6.1 INTRODUCTION

On January 26, 1990, the Secretary of Energy directed all line organizations to implement a comprehensive self-assessment program to identify and characterize environment, safety, and health (ES&H) concerns relating to their operations and directed the Tiger Teams to evaluate the effectiveness of the self-assessment programs of the sites being reviewed. On July 31, 1990, the Secretary issued guidance on the conduct of self-assessments, stressing the importance of comprehensive, routine self-assessments within the U.S. Department of Energy (DOE) and its contractors.

6.2 SCOPE

The Tiger Team evaluated the self-assessment reports and programs of the DOE Office of Fossil Energy (FE); the DOE Office of Naval Petroleum and Oil Shale Reserves at Headquarters (DOE/NPOSR); the DOE Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming Site Office (DOE/NPOSR-CUW); and John Brown Engineers and Constructors Inc. (JBEC), the operating contractor.

For FE, the Tiger Team evaluation included an assessment of the programs and program plans of the Office of the Deputy Assistant Secretary for Naval Petroleum and Oil Shale Reserves (FE-60) and the Office of Self-Assessment (FE-6). In addition, the Tiger Team evaluated an internal appraisal completed by DOE/NPOSR, as well as management appraisals of DOE/NPOSR and DOE/NPOSR-CUW completed by FE-6.

For DOE/NPOSR-CUW, the Tiger Team evaluation included the April 1992 self-assessment report and the May 1992 Self-Assessment Program Manual. As a part of the evaluation of the Self-Assessment Program, the Management Subteam also evaluated the status of self-assessment institutionalization within the organization. DOE/NPOSR-CUW conducted a self-assessment in June 1991. However, the Tiger Team did not receive the document until the day before publication of the Tiger Team report and, therefore, did not have time to compare the findings of the June 1991 self-assessment to the Tiger Team findings and concerns.

For JBEC, the Tiger Team evaluation included the April 1992 self-assessment report and the June 1992 Self-Assessment Program Manual. As a part of the evaluation of the JBEC Self-Assessment Program, the Management Subteam also evaluated the status of self-assessment institutionalization within the operating contractor’s organization.

The JBEC self-assessment report is an effective building block for DOE and the future contractor. Although it does not go into extensive detail about the problems that exist, it adequately describes the universe of deficiencies.

6.3 EVALUATION STRATEGY

The Self-Assessment Task Group developed an understanding of the organizational roles, responsibilities, and authorities of FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBEC by reviewing a series of program documents before the onsite assessment. These documents included information on the FE, DOE/NPOSR,
DOE/NPOSR-CUW, and JBEC organizations, missions, and self-assessment activities. When the Self-Assessment Task Group and the Management Subteam arrived onsite, briefings were conducted concerning the DOE/NPOSR-CUW and JBEC personnel concerning ESHH and self-assessment activities at Naval Petroleum Reserve Number 3 (NPR-3), Naval Oil Shale Reserve Number 1 (NOSR-1), and Naval Oil Shale Reserve Number 3 (NOSR-3); ESHH policies and goals; and the adequacy of supporting documentation. These interviews were supplemented by a detailed review of supporting documentation describing such topics as the organization, roles, responsibilities, policies, plans, budgets, procedures, and performance criteria for the organizational elements performing ESHH functions and conducting operational programs at NOSR-3, NOSR-1, and NOSR-3.

On July 7, 1992, selected Management Subteam conducted interviews at DOE Headquarters with personnel from FE, FE-6, and DOE/NPOSR to discuss similar self-assessment programmatic areas.

To further support the Management Subteam's onsite assessment, daily debriefings and consultations were held with the Environmental and the Safety and Health Subteams. The objective of these interactions was to identify potential management and organizational problems that might be common to the findings of all of the subteams. The Management Subteam identified individuals to serve as points of contact with the Environmental and the Safety and Health Subteams. These points of contact attended the daily debriefings of each of the other subteams.

The self-assessment review was conducted by the Management Subteam along with a Self-Assessment Task Group, the latter of which was comprised of two representatives from the Management Subteam and one representative each from the Environmental and the Safety and Health Subteams. The Management Subteam also evaluated other elements of management performance to gain a broader perspective of the assimilation and understanding of the self-assessment process by NPOSR-CUW managers and employees.

The review was conducted using the following guidance:

Secretary of Energy Notice (SEN)-6E-92, "Departmental Organizational and Management Arrangements" (February 21, 1992);
Memorandum: "Guidance on Environmental, Safety, and Health Self-Assessment," from the Secretary of Energy to Secretarial Officers, Managers, Operations Offices, Administrators, and Power Marketing Administrations (July 31, 1990);
Draft Environment, Safety, and Health Management Performance Objectives and Criteria for Tiger Team Management Assessments (August 15, 1991);

Lines of inquiry used by the Management Subteam and Self-Assessment Task Group to assess the self-assessment reports and programs were compiled by the staff involved in conducting self-assessment activities at each organizational level of FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBEC. A system of both a random and selected interview process was used to assess management and employee self-assessment involvement and understanding.

The Management Subteam developed 3 preliminary observations for FE, 55 preliminary observations for DOE/NPOSR-CUW, and 59 preliminary observations for JBEC. The subteam performed a peer review of these observations before releasing them to DOE/NPOSR-CUW and JBEC to validate for factual accuracy on July 1, 1992. Subsequently, the Management Subteam prepared 30 findings based on the validated preliminary observations and additional interviews and document reviews. Six of the 30 findings were specific to self-assessment. Both the management and self-assessment findings were subjected to a peer review before being released to DOE/NPOSR-CUW and JBEC for a factual accuracy review. The resulting 30 findings were reviewed for factual accuracy by FE, DOE/NPOSR, DOE/NPOSR-CUW, and JBEC.

6.4 EVALUATION SUMMARY

6.4.1 Self-Assessment Overview

FE has made significant progress in the self-assessment area. This progress includes the development of a self-assessment framework that flows down through the entire line organization from FE-1 to the operating contractor. While FE has taken an aggressive approach to self-assessment, necessary program elements have not been developed and instituted in a timely fashion. This has slowed progress in the development and implementation of a comprehensive self-assessment program. Field organizations and the operating contractor have not been provided timely guidance and direction for the development and conduct of self-assessment activities. Correction of the deficiencies presented in the Tiger Team findings should strengthen the efforts of FE to institutionalize the total self-assessment program using the existing framework as the basis for further development. The self-assessment framework and the self-assessment program that has been implemented throughout the line organizations. It can serve as a foundation for the future development of other important ESHH programs within FE. There has been progress, but much remains to be done to ensure that an institutionalized, comprehensive self-assessment program is fully developed and implemented throughout the FE organization.

FE established FE-6, which has developed a Self-Assessment Program Plan and is in the process of implementing that plan. FE has conducted management appraisals of DOE/NPOSR and DOE/NPOSR-CUW and its operating contractor, JBEC. These management appraisals are an important element of the Self-Assessment Program, but these are not a substitute for self-assessments as defined in Secretarial guidance on self-assessment (January 26, 1990 and July 31, 1990). Consistent with their implementation plan, DOE/NPOSR conducted an annual internal appraisal and a management appraisal of DOE/NPOSR-CUW. The internal appraisal has been examined as part of this self-assessment evaluation. Both DOE/NPOSR-CUW and JBEC have developed a Self-Assessment Program Plan, conducted a self-assessment, and developed a corrective action plan to address the deficiencies identified in their self-assessments.
6.4.2 Summary of Self-Assessment Program Findings

The Tiger Team review of the FE, DOE/NPOSR-CUW, DOE/NPOSR-CUW, and JBEC self-assessments and programs led to the identification of one finding for FE, one finding for DOE/NPOSR, two findings for DOE/NPOSR-CUW, and two findings for JBEC. The self-assessment finding numbers and statements are presented in Table 6-1.

<table>
<thead>
<tr>
<th>TABLE 6-1</th>
<th>SUMMARY OF SELF-ASSESSMENT FINDINGS</th>
</tr>
</thead>
<tbody>
<tr>
<td>SA-1 FE Program Office Self-Assessment Program</td>
<td>FE has neither fully developed or implemented its Self-Assessment Program, nor supplied timely, formal guidance to the field regarding self-assessment.</td>
</tr>
<tr>
<td>SA-2 DOE/NPOSR Self-Assessment Program</td>
<td>DOE/NPOSR has not fully developed or implemented its Self-Assessment Program, nor supplied timely, formal guidance to the field regarding self-assessment.</td>
</tr>
<tr>
<td>SA-3 DOE/NPOSR-CUW Self-Assessment Program</td>
<td>DOE/NPOSR-CUW has not fully developed or implemented its Self-Assessment Program.</td>
</tr>
<tr>
<td>SA-4 DOE/NPOSR-CUW Self-Assessment Report</td>
<td>The DOE/NPOSR-CUW April 1992 self-assessment report does not provide the level of detail needed to establish a clear understanding of the deficiencies existing in the ES&amp;H programs at NPOSR-CUW.</td>
</tr>
<tr>
<td>SA-5 JBEC Self-Assessment Program</td>
<td>JBEC has not fully developed or implemented its Self-Assessment Program.</td>
</tr>
<tr>
<td>SA-6 JBEC Self-Assessment Report</td>
<td>The JBEC April 1992 self-assessment report does not provide the level of detail needed to establish a clear understanding of the deficiencies existing in the ES&amp;H programs at NPOSR-CUW.</td>
</tr>
</tbody>
</table>

6.4.3 Evaluation of Self-Assessment Reports

The Tiger Team findings and concerns were compared with those identified by DOE/NPOSR, DOE/NPOSR-CUW, and JBEC in their internal appraisals and self-assessment reports, and a determination was made as to whether each finding and concern was fully, partially, or not identified. The results of these comparisons are summarized in Table 6-2.

<table>
<thead>
<tr>
<th>TABLE 6-2</th>
<th>COMPARISONS OF DOE/NPOSR, DOE/NPOSR-CUW, AND JBEC SELF-ASSESSMENT REPORT FINDINGS AND CONCERNS WITH TIGER TEAM RESULTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Organization</td>
<td>Fully Identified</td>
</tr>
<tr>
<td>----------------</td>
<td>--------------------</td>
</tr>
<tr>
<td>DOE/NPOSR</td>
<td>0 (0%)</td>
</tr>
<tr>
<td>DOE/NPOSR-CUW</td>
<td>36 (37%)</td>
</tr>
<tr>
<td>JBEC</td>
<td>87 (53%)</td>
</tr>
</tbody>
</table>

6.5 EVALUATION OF U.S. DEPARTMENT OF ENERGY OFFICE OF FOSSIL ENERGY

6.5.1 Evaluation of FE Self-Assessment Program

FINDING SA-1 FE Program Office Self-Assessment Program

FE has neither fully developed or implemented its Self-Assessment Program, nor supplied timely, formal guidance to the field regarding self-assessment.

Discussion

FE has made significant progress in establishing a comprehensive self-assessment program. FE has taken steps toward fulfilling the requirements of SEN-6E-92 for an independent self-assessment organization by creating the Office of Self-Assessment (FE-6). FE-6 has developed an Office of Fossil Energy Self-Assessment Program Plan (March 1992), which contains the basic elements of a self-assessment program as set forth in the July 31, 1990, Secretarial guidance. This plan has been approved by the Assistant Secretary for Fossil Energy.

The Self-Assessment Program Plan has been forwarded to all FE Headquarters and field organizations, and comments have been received from some of these organizations. FE-6 said it realizes that the plan will need to be augmented with standard operating procedures or other formal operating guidelines to address some of the comments. Although a schedule for the completion of this augmentation has not been established, the augmentation will be initiated with a meeting scheduled by FE-6 with their group counterparts to be held at DOE Headquarters in August 1992.
FE-6 has conducted formal management appraisals of DOE/NPOSR, DOE/NPOSR-CUW, and JBEC organizations as part of its Self-Assessment Program. However, FE has not fully developed or implemented a comprehensive self-assessment program as evidenced by the following:

While FE-6 was established with the intent of being an independent self-assessment organization, the additional duties placed on the FE-6 staff act to lessen the office's degree of independence in the self-assessment process. FE has placed responsibility for National Environmental Policy Act (NEPA) compliance and occupational safety and health (OSH) assistance in the FE-6 organization. FE-6 provides program guidance and direction in these areas to the entire FE organization and, is also responsible for self-assessment activities which include the assessment of NEPA and OSH performance within FE. Therefore, self-assessment activities are being conducted, in some cases, by the same organization and personnel that have direct program assistance responsibility for the activities being assessed. This is not consistent with the requirement for an independent self-assessment organization set forth in SEN-6E-92.

While the Self-Assessment Program Plan cites the need for conducting root cause analysis, it does not include the methodology to be utilized or other detailed information on the approach to be taken to ensure performance of a comprehensive, uniform, and useful root cause analysis. The root cause analysis performed as part of the management appraisals of DOE/NPOSR, DOE/NPOSR-CUW, and JBEC was valid and reliable, but the existing plan does not adequately address root cause analysis methodology to ensure that it is conducted in a consistent, effective, and standardized manner.

Although the Self-Assessment Program Plan indicates the need for a formal system to communicate lessons learned and outlines the types of information that will form the basis for such a system, the lessons learned component of the plan does not specify or explain the method or system to be used in disseminating ES&H information to the various FE organizational units. The distribution of lessons learned is particularly important for the FE situation where they share many common concerns and other issues such as methods of applying with DOE Orders, requirements, and good management practices. Management at the various sites need to share information on common issues such as how to apply a graded approach to the application of specific program elements and how resources can best be used and collectively shared in addressing corrective actions. However, there is no evidence that a lessons-learned program has been implemented.

The Self-Assessment Program Plan addresses the need for a corrective action process which includes tracking and verification components. The plan provides a description of data elements (e.g., milestones and cost) to be included in tracking systems. The plan calls for "a computerized system" and "a network system," but does not provide a more in-depth explanation of how the systems are to be developed and implemented. While FE-1 has committed to the use of an FE-wide corrective action tracking system in a June 1, 1992, memorandum to his Deputy Assistant Secretaries and Office Directors, a fully developed process which tracks the status of ES&H deficiencies identified through the Self-Assessment Program has not been implemented.

The FE Self-Assessment Program Plan addresses the development of corrective actions, schedules, milestones, and cost estimates. However, the Program Plan does not address the methodology of how these corrective actions will be prioritized to ensure that the most crucial items are the first to be corrected. FE has not applied the corrective action component of its program by producing corrective action plans or instituting a formal procedure for monitoring corrective actions generated by its various organizational components. Further, the FE Self-Assessment Program has not yet adequately incorporated important ES&H information sources, such as performance indicators and the occurrence reporting system.

While the Self-Assessment Program Plan states that personnel responsible for conducting appraisals should be properly trained and training should be scheduled as appropriate, the training needs and elements are not developed and described in the plan. While some training has been conducted, a comprehensive training program has not been fully developed or implemented.

The FE Self-Assessment Program Plan calls for independent verification and evaluation of the status and quality of (1) its ES&H performance, (2) the Program-Wide Self-Assessment Program, and (3) the discharge of ES&H responsibilities. FE does not describe how these requirements will be accomplished. Without the implementation procedures of each element, the self-assessment program cannot be considered comprehensive in scope. Similarly, FE calls for independent appraisals of itself, but does not define how they will be accomplished.

FE has not supplied its field organizations with timely, formal assistance, and followup regarding development and implementation of its Self-Assessment Program. The first Departmental directives regarding self-assessment were issued on January 31, 1990 (transmitted Secretarial guidance on ES&H self-assessment to its Deputy Assistant Secretaries and line organizations on February 1, 1990). At least two of FE's subordinate organizations, DOE/NPOSR and DOE/NPOSR-CUW, were not provided with the July 31, 1990, Secretarial guidance containing the Tiger Team performance objectives and criteria for evaluating DOE and contractor self-assessment programs until July 25, 1991. Assistance to DOE/NPOSR-CUW was not provided until February 1992. The failure to transmit timely guidance has had an adverse impact on the field's conduct of self-assessment activities.

Cross References

Findings MF-14 and MF-20
6.5.2 Evaluation of Self-Assessment Report

At the time of the Tiger Team Assessment of DOE/NPOSR-CUW, FE had not completed a self-assessment or internal appraisal. The management appraisals of DOE/NPOSR and DOE/NPOSR-CUW did not include a review of FE.

6.6 EVALUATION OF U.S. DEPARTMENT OF ENERGY OFFICE OF NAVAL PETROLEUM AND OIL SHALE RESERVES

6.6.1 Evaluation of DOE/NPOSR Self-Assessment Program

FINDING SA-2 DOE/NPOSR Self-Assessment Program

DOE/NPOSR has neither fully developed or implemented its Self-Assessment Program, nor supplied timely, formal guidance to the field regarding self-assessment.

Discussion

DOE/NPOSR has taken positive steps in the establishment of a comprehensive self-assessment program. DOE/NPOSR has developed a Self-Assessment Implementation Plan which contains the basic elements of a self-assessment program as set forth in the July 31, 1990, Secretarial guidance. This plan has been approved by the Assistant Secretary for Fossil Energy (FE-I) and the Deputy Assistant Secretary of Naval Petroleum and Oil Shale Reserves. DOE/NPOSR has conducted a formal management appraisal of the DOE/NPOSR-CUW and JBEC organizations and an internal appraisal as part of its Self-Assessment Program. However, DOE/NPOSR has not fully developed or implemented a comprehensive self-assessment program based on the following:

DOE/NPOSR's Office of Planning and Technical Assurance (FE-60) has been given primary responsibility for conducting the DOE/NPOSR Self-Assessment Program. Among FE-60's mission functions are ES&H oversight of field operations and ES&H planning activities associated with the field organizations. FE-60 provides program guidance and direction in these areas to the NPOSR field organizations and also is responsible for self-assessment activities which include the assessment of ES&H activities, (e.g., oversight and planning). Therefore, self-assessment activities are being conducted by the same organization that has direct program and assistance responsibility for the activities being assessed. This is not consistent with the requirement for an independent self-assessment organization or function as required by SEN-6E-92.

While the Self-Assessment Program Plan cites the need for conducting root cause analysis, it does not identify the methodology to be utilized or other detailed guidance to ensure comprehensive, useful root cause analysis is performed in a consistent and effective manner. The root cause analysis performed as part of the management appraisal of DOE/NPOSR-CUW and JBEC, and the internal appraisal of DOE/NPOSR was inadequate because it was limited to a listing of the most frequently occurring causal factors.

Although the Self-Assessment Program Plan specifies the need for a system to communicate lessons learned and assigns responsibility for these activities, the lessons-learned component of the plan does not specifically identify or explain the method or system to be used in disseminating ES&H information to the various NPOSR organizational units. The distribution of lessons learned is
particularly important for FE and the NPOSR sites as they share many common issues such as methods to comply with DOE Orders, requirements, and good management practices. Management at the various sites need to share information on common issues, such as how to apply a graded approach to specific program implementation and how resources can best be used and collectively shared in addressing corrective action.

The listed sources of information (i.e., Occurrence Reporting and Processing System (ORPS) and other performance indicator information) which will feed into the lessons-learned program are narrow in scope and do not include lessons learned from self-assessment activities. Additionally, the annual distribution of information is not appropriate since a lessons-learned program should be a real-time and a continuous process which provides information to organizations to avoid the repetition of problems that have already occurred elsewhere. While some information has been obtained through the ORPS, there is no evidence that the lessons-learned program has been fully implemented.

The Self-Assessment Program Plan addresses the need for a corrective action process which includes tracking and verification components. The plan provides a description of data elements (e.g., completion date and status) to be tracked in tracking systems. However, the plan does not ensure that cost estimates and funding sources will be included in the tracking system. Additionally, the plan calls for a system, but does not provide an in-depth explanation of how the system is to be developed and implemented. FE-60 has verbally indicated it plans on utilizing the CATTS system for tracking, but a fully implemented process which tracks the status of ES&H deficiencies identified through the self-assessment program is not yet in place.

The DOE/NPOSR Self-Assessment Program Plan addresses the development of corrective actions, including prioritization to ensure that the most crucial items are the first to be corrected. However, the Self-Assessment Program Plan does not describe the methodology for how DOE/NPOSR intends to produce corrective action plans with realistic time schedules, measurable milestones, and reasonable cost estimates with identified funding sources.

The training component of the Self-Assessment Program Plan effectively addresses the training issues by outlining sample training courses according to emphasis area (e.g., analytical techniques) and requiring a thorough review of the potential participants training record. However, the plan does not provide for a needs analysis element to distinguish which courses are required or preferred to prepare an individual to effectively participate in the self-assessment functions. While some training has been conducted, a comprehensive performance-based training program has not been fully developed and implemented.

Cross References
Findings MF-1, MF-3, MF-14, and MF-20
Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of DOE/NPOSR (July 1992).
Internal Appraisal
This finding was partially addressed in the DOE/NPOSR internal appraisal (June 1992).

6.6.2 Evaluation of DOE/NPOSR Internal Appraisal
The Management Subteam compared its findings to the findings of the DOE/NPOSR internal appraisal. This comparison is presented in Table 6-3.

| TABLE 6-3 | COMPARISON OF DOE/NPOSR INTERNAL APPRAISAL FINDINGS AND CONCERNS WITH MANAGEMENT SUBTEAM RESULTS |
| --- | --- | --- | --- | --- |
| Organization | Fully Identified | Partially Identified | Not Identified | Total |
| DOE/NPOSR | 0 (0%) | 3 (75%) | 1 (25%) | 4 |

DOE/NPOSR has not supplied its field organizations with timely, formal guidance regarding self-assessment, although the first Departmental directives regarding self-assessment were issued as early as January 26, 1990. DOE/NPOSR did not transmit any formal guidance to the field until July 1991. The failure to transmit timely guidance has had an adverse impact on the field’s conduct of self-assessment activities.
6.7 EVALUATION OF U.S. DEPARTMENT OF ENERGY NAVAL PETROLEUM OIL SHALE RESERVES IN COLORADO, UTAH, AND WYOMING SITE OFFICE

6.7.1 Evaluation of DOE/NPOSR-CUW Self-Assessment Program

FINDING SA-3 DOE/NPOSR-CUW Self-Assessment Program

DOE/NPOSR-CUW has not fully developed or implemented its Self-Assessment Program.

Discussion

DOE/NPOSR-CUW has developed a framework for the establishment of a comprehensive Self-Assessment Program. The first step in developing that framework was the performance of March 1992 self-assessment. Following this, DOE/NPOSR-CUW prepared and received approval of a Self-Assessment Program Manual. The manual was revised during May 1992 and approved by the Assistant Secretary for Fossil Energy on June 11, 1992. This manual incorporated the lessons learned from the experience of conducting the initial self-assessment without a plan. Revisions to the plan were based on comments received from the Office of Self-Assessment (FE-6). DOE/NPOSR-CUW was also the subject of a management appraisal conducted from May 11-15, 1992, by FE-6 with a final report dated June 1992 and a management appraisal conducted during May 1992 by DOE/NPOSR (FE-60). DOE/NPOSR-CUW plans to implement the corrective actions for the self-assessment report of March 1992 and the Management Appraisals of FE-6 and FE-60 along with the Tiger Team corrective actions.

The self-assessment report, Self-Assessment Plan, and Corrective Action Plan provide the basic framework for the DOE/NPOSR-CUW Self-Assessment Program; however, the Program is not yet fully developed and implemented. A review of the May 1992 Self-Assessment Program Manual in comparison with (1) the Secretarial guidance of July 31, 1990, (2) the ES&H Management Performance Objectives and Criteria for Tiger Team Management Assessments (August 15, 1991), and (3) the management appraisals of FE-6 and FE-60, indicates that, although the work done to date represents a good first step, much work remains to be done to fully develop the Self-Assessment Program. The Tiger Team identified the following deficiencies in the Self-Assessment Program:

DOE/NPOSR-CUW did not develop and receive approval of its Self-Assessment Program Manual in a timely manner. This is partly due to the lack of timely guidance from the Director, NPOSR, the time expended to prepare the March 1992 self-assessment in response to the directive of Director, NPOSR, and the focus of the staff on the scheduled Tiger Team Assessment.

The Self-Assessment Program Plan does not address how the organizational independence called for in SEN-6E-92 will be achieved. DOE/NPOSR-CUW's Self-Assessment Program Standard Operating Procedure (DOE-SAP-SOP)-2 does not provide for such an independent organization, although it does acknowledge that "third party, independent, in-depth evaluations/validations are critical to maintaining objectivity within the process." It does not indicate how this third-party support or independence will be determined or provided. However, the Management Subteam
recognizes that due to the small size of the DOE/NPOSR-CUW organization, they do not have the resources to establish a truly independent self-assessment organization in accordance with SEN-6E-92.

Although the plan describes the methodology to be used to review the internal performance of the operating contractor, it does not describe the methodology or approach for assessing the performance of DOE/NPOSR-CUW. Similarly, the plan does not clearly establish linkage or coordination points between the oversight role of DOE/NPOSR-CUW and the operational role of the operating contractor.

DOE-SAP-SOP-2 and DOE-SAP-SOP-4 do not indicate how the independent verification and evaluation of the status and quality of ES&H performance and the self-assessment process, including the discharge of ES&H responsibilities by DOE/NPOSR-CUW management, will be accomplished. As previously pointed out, DOE-SAP-SOP-2 does call for third-party participation, but it does not indicate how this participation will be provided. DOE-SAP-SOP-4 does not provide implementing details on how independent self-assessment evaluations will be performed by qualified personnel not directly responsible for the activity being assessed.

The DOE/NPOSR-CUW Self-Assessment Program Plan does not contain provisions for the utilization of important ES&H information sources, such as performance indicators and occurrence reporting. The Self-Assessment Program does not have standard operating procedures for utilizing formal systems for conducting root cause analysis and incorporating lessons learned.

Corrective actions are being tracked in accordance with DOE-SAP-SOP-6. Findings and corrective actions for the March 1992 self-assessment, as well as the findings and subsequent corrective actions for the Tiger Team Assessment, are to be tracked using a Self-Assessment Database as described in DOE-SAP-SOP-6. This database was used to prepare DOE/NPOSR-CUW’s Corrective Action Plan (June 1992) which indicates that only two of the seven corrective actions to be completed in May and June 1992 have been completed, and none of them contain cost estimates for completion. The corrective actions identified in the March 1992 Self-Assessment lack realistic and appropriately phased, sequenced, and prioritized schedules with measurable milestones. They also failed to include cost estimates with identified funding sources and are currently behind schedule.

The Self-Assessment Program does not incorporate appraisal activities required by DOE 5482.1B, *Environment, Safety, and Health Appraisal Program.* This DOE Order has not been implemented in such a way that ongoing oversight activities are adequately integrated into the DOE/NPOSR-CUW Self-Assessment Program. According to the FE Self-Assessment Program Plan, results of Management Appraisals and other external assessments (e.g., Tiger Team Assessments and Technical Safety Appraisals) should be used to determine both the scope and frequency of functional appraisals. More fundamentally, in DOE-SAP-SOP-3, there is not a clear basis or criteria established for the scheduling of annual functional appraisals, which according to the plan include management and environmental activities. However, the FE Self-Assessment Program requires that functional and management appraisals be conducted only on a triennial basis.

DOE-SAP-SOP-5 provides for preparation and conduct of self-assessment training; however, it lacks specificity on training schedules and the types of training in various fundamental self-assessment activities, such as root cause analysis or lessons learned, that will be provided.

Cross References

Findings MF-2, MF-3, MF-6, MF-11, MF-15, and MF-20

Self-Assessment

This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal

This finding is partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and the DOE/NPOSR Office of Technical Assurance management appraisal of NPOSR-CUW (May 1992).

6.7.2 Evaluation of DOE/NPOSR-CUW Self-Assessment Report

FINDING SA-4

DOE/NPOSR-CUW Self-Assessment Report

The June 1992 self-assessment report does not provide the level of detail needed to establish a clear understanding of the deficiencies existing in the ES&H programs at NPOSR-CUW.

Discussion

DOE/NPOSR-CUW showed initiative by performing an ES&H Self-Assessment in conjunction with JBEC during 1991. However, no followup or corrective actions were performed based on the self-assessment. A more extensive DOE/NPOSR-CUW self-assessment was conducted between February and April 1992, and resulted in a two-volume report last revised in April 1992. The assessment team was composed of DOE/NPOSR-CUW professionals (Self-Assessment Committee) who conducted the assessment. The self-assessment report was fairly comprehensive in scope covering DOE facilities and addressing major areas in each ES&H discipline. The report included corrective actions, key findings, and root causes.

DOE/NPOSR-CUW also hired a contractor to prepare site-specific performance objectives and criteria (POCs). However, the resulting product was relatively unchanged from the previously mentioned performance objectives and criteria. The committee performed the self-assessment by making a judgment as to whether or not the organization met the POCs. The committee made no other attempt to validate those determinations by a performance-based actual field review of current operating practices and systems.

The POCs developed in the documents mentioned above are intended to provide general guidelines for a particular assessment element rather than provide specific guidelines for a detailed, site-specific assessment. Their use may result in capturing many of the most obvious deficiencies and to initiate appropriate corrective actions. However, the total reliance on the POCs will not provide the level of detail needed to establish a clear understanding of the deficiencies and to initiate appropriate corrective actions.

Other deficiencies in the self-assessment identified by the Tiger Team include the following:

DOE/NPOSR-CUW did not perform a review of DOE Orders, Secretary of Energy Notices (SENs), codes/standards, or other regulations to establish a baseline of regulatory compliance functions, required systems, and best management practices which were specific to their oil field production mission and operation. Since they did not have a catalog of baseline requirements, no attempt was made to specifically analyze existing procedures, operations, or systems to determine whether they were consistent with DOE requirements and standards.

The Management Subteam recognizes that DOE/NPOSR-CUW is a small office with limited resources. However, the self-assessment activities were conducted by employees who "are responsible for ESH management, oversight and performance" (April 1992 DOE/NPOSR-CUW self-assessment report). The assessment was conducted by individuals who were responsible for the programs which they were assessing. This is not consistent with the requirement for independence in conducting self-assessment activities. Additionally, most of the individuals who conducted the assessment activities lacked adequate training and professional experience in auditing ESH issues and activities.

The root cause analysis of the results of the assessment was not conducted on a consistent basis across the three disciplines assessed. Further, the environmental and safety and health root cause analysis was inadequate. The environmental root causes are a listing of causal factors and the frequency of their occurrence with no real analysis conducted. The safety and health root causes are simply a rewording of the associated key findings.

The findings listed in the self-assessment report are under-developed and incomplete. They are generally a verbatim repetition of the associated POC with little or no technical discussion of the issue or explanation of the deficiency. There is also little evidence that performance-based field investigations were conducted in connection with the assessment activities. The corrective actions written to respond to the findings also lack technical depth and a comprehensive explanation of the actions that will be taken with appropriate interim milestones.

Cross References
Findings MF-2, MF-3, MF-6, MF-11, MF-15, and MF-20

Self-Assessment
This finding was partially identified in the DOE/NPOSR-CUW self-assessment (April 1992).

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal (June 1992) and the DOE/NPOSR Office of Technical Assurance management appraisal of NPOSR-CUW (May 1992).

The results of DOE/NPOSR-CUW's findings and concerns as compared to those identified by the Tiger Team report are presented in more detail in Table 6-4 that follows.

The evaluation of the DOE/NPOSR-CUW Self-Assessment by the Tiger Team is discussed below.

6.7.2.1 Environment
The DOE/NPOSR-CUW assessment was a functional appraisal of its role of policy development, interpretation and implementation, and oversight of ESH. The DOE/NPOSR-CUW assessment identified programmatic deficiencies in all environmental disciplines. In comparison with the Tiger Team Findings, 10 were fully identified, 29 were partially identified, and 14 were not identified. Table 6-3 provides a comparison of the DOE/NPOSR-CUW and Tiger Team Assessments.
The self-assessment was tailored to maximize the identification of program deficiencies likely to be discovered by the Tiger Team. This approach generally involved reviewing the POCs and then restating them as a negative finding against the DOE/NPOSR-CUW program. DOE/NPOSR-CUW generally failed to probe deeper into the issues to identify noncompliances with regulations and risks to the environment and human health resulting from these programmatic deficiencies. There was little evidence that confirmatory interviews or related investigations were conducted. There appears to be a limited appreciation of the fact that programs, in and of themselves, are not an end in themselves. Rather, they are the disciplined means to achieve environmental compliance and, ultimately, excellence. The "fully" ratings refer to findings that are purely programmatic (e.g., lack of a NEPA program). The "partially" ratings refer to findings where programmatic issues are identified, but specific issues are omitted (e.g., lack of a Spill Prevention Control and Countermeasure (SPCC) Plan, without identification of the ramifications, such as inadequate secondary containment around tanks, insufficient response equipment, and lack of training for responders). Thus, "partially identified" is a minimal term, usually meaning less than 50 percent. This also leads to corrective action statements that are superficial, non-responsive to the issues, and lacking in detail.

### 6.7.2.2 Safety and Health

The DOE/NPOSR-CUW self-assessment varied in scope across the technical areas reviewed by the Safety and Health (S&H) Subteam due to the nature and number of assessment criteria applied. For each criterion, a finding and corrective action statement was made. In many cases, these statements were superficial, lacking any significant discussion or analysis of the findings. There was little evidence that the nature of the deficiencies identified was well understood by the ES&H committee performing the self-assessment. In many instances, repetitious phrases were used stating criteria had not been met, followed by a corrective action statement that they would be met without providing evidence that DOE/NPOSR-CUW had a basic understanding of the problem and necessary corrective action.

Of the concerns identified by the S&H Subteam, 70 percent had been fully identified in the self-assessment and 10 percent partially identified. This relatively high (80 percent) identification and partial identification of concerns in the self-assessment appears more attributable to the criteria employed, rather than to a basic knowledge of the deficiencies.

Six key findings were derived from the general findings and presented in the self-assessment along with root causes and corrective actions. The key findings were largely directed to JBEC and included DOE/NPOSR-CUW only in general terms; for example, one key finding stated that DOE/NPOSR-CUW lacks administration systems. The root causes developed were not adequate as they did not reflect fundamental issues, that if corrected, would address the key findings. Instead, they appeared to be key findings that still had underlying unresolved issues. The corrective actions, derived from the key findings, were general statements that had little relevance to corrective action. In addition, specific action plans had not been prepared.

Overall, the DOE/NPOSR-CUW self-assessment had fully identified 70 percent and partially identified 10 percent of the S&H Subteam's concerns. The S&H Subteam does not believe, however, that a fundamental understanding of the deficiencies exists and what will be needed to correct them as the responsibility for corrective action was placed on JBEC, in many instances. It did not clearly identify the role DOE/NPOSR-CUW must take in correcting these deficiencies except that DOE will ensure compliance through its Self-Assessment Program. Table 6-3 provides a comparison of the DOE/NPOSR-CUW and Tiger Team Assessments with regard to safety and health concerns.

#### 6.7.2.3 Management

The DOE/NPOSR-CUW self-assessment addressed many important deficiencies and was a critical self-evaluation. In general, DOE/NPOSR-CUW identified most of those findings noted by the Management Subteam. There are, however, weaknesses in the self-assessment approach, including the fact that (1) the criteria for conducting the assessments was limited to the management performance objectives and criteria, and (2) the root causes identified were only symptoms or causal factors and do not represent the fundamental origins of the deficiencies. Therefore, it is possible that a number of deficiencies still remain unidentified, and if actions are limited to the identified symptoms, the true root cause will likely continue. In addition, the corrective action plan lacked specific elements or milestones, and the corrective action implementation schedule appeared to be overly optimistic.

### TABLE 6-4

<table>
<thead>
<tr>
<th>Area</th>
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<th>Partially Identified</th>
<th>Not Identified</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety and Health</td>
<td>14 (70%)</td>
<td>2 (10%)</td>
<td>4 (20%)</td>
</tr>
<tr>
<td>Environmental</td>
<td>19 (31%)</td>
<td>29 (47%)</td>
<td>14 (22%)</td>
</tr>
<tr>
<td>Management</td>
<td>3 (23%)</td>
<td>8 (62%)</td>
<td>2 (15%)</td>
</tr>
<tr>
<td>TOTAL</td>
<td>36 (37%)</td>
<td>40 (42%)</td>
<td>20 (21%)</td>
</tr>
</tbody>
</table>

The self-assessment varied in scope across the technical areas reviewed by the Safety and Health (S&H) Subteam due to the nature and number of assessment criteria applied. For each criterion, a finding and corrective action statement was made. In many cases, these statements were superficial, lacking any significant discussion or analysis of the findings. There was little evidence that the nature of the deficiencies identified was well understood by the ES&H committee performing the self-assessment. In many instances, repetitious phrases were used stating criteria had not been met, followed by a corrective action statement that they would be met without providing evidence that DOE/NPOSR-CUW had a basic understanding of the problem and necessary corrective action.

Of the concerns identified by the S&H Subteam, 70 percent had been fully identified in the self-assessment and 10 percent partially identified. This relatively high (80 percent) identification and partial identification of concerns in the self-assessment appears more attributable to the criteria employed, rather than to a basic knowledge of the deficiencies.

Six key findings were derived from the general findings and presented in the self-assessment along with root causes and corrective actions. The key findings were largely directed to JBEC and included DOE/NPOSR-CUW only in general terms; for example, one key finding stated that DOE/NPOSR-CUW lacks administration systems. The root causes developed were not adequate as they did not reflect fundamental issues, that if corrected, would address the key findings. Instead, they appeared to be key findings that still had underlying unresolved issues. The corrective actions, derived from the key findings, were general statements that had little relevance to corrective action. In addition, specific action plans had not been prepared.

Overall, the DOE/NPOSR-CUW self-assessment had fully identified 70 percent and partially identified 10 percent of the S&H Subteam's concerns. The S&H Subteam does not believe, however, that a fundamental understanding of the deficiencies exists and what will be needed to correct them as the responsibility for corrective action was placed on JBEC, in many instances. It did not clearly identify the role DOE/NPOSR-CUW must take in correcting these deficiencies except that DOE will ensure compliance through its Self-Assessment Program. Table 6-3 provides a comparison of the DOE/NPOSR-CUW and Tiger Team Assessments with regard to safety and health concerns.

#### 6.7.2.3 Management

The DOE/NPOSR-CUW self-assessment addressed many important deficiencies and was a critical self-evaluation. In general, DOE/NPOSR-CUW identified most of those findings noted by the Management Subteam. There are, however, weaknesses in the self-assessment approach, including the fact that (1) the criteria for conducting the assessments was limited to the management performance objectives and criteria, and (2) the root causes identified were only symptoms or causal factors and do not represent the fundamental origins of the deficiencies. Therefore, it is possible that a number of deficiencies still remain unidentified, and if actions are limited to the identified symptoms, the true root cause will likely continue. In addition, the corrective action plan lacked specific elements or milestones, and the corrective action implementation schedule appeared to be overly optimistic.
FINDING SA-5

JBEC has not fully developed or implemented its Self-Assessment Program.

Discussion

JBEC has developed a framework for establishing a comprehensive Self-Assessment Program. The first step in developing that framework was the performance of an initial April 1992 self-assessment. Following this, JBEC prepared and received approval of their Self-Assessment Program Manual from the Director, NPOSR-CUW and the Director, NPOSR as of June 3 and 8, 1992, respectively. This plan incorporated the lessons learned from the experience of conducting the initial self-assessment without a plan. JBEC was also included in the management appraisal of May 11-15, 1992, conducted by the Office of Self-Assessment (FE-6), and the management appraisal conducted by DOE/NPOSR (FE-60) in May 1992. JBEC plans to implement the corrective actions for the self-assessment report of April 1992, and the management appraisals of FE-6 and FE-60 along with the Tiger Team corrective actions.

The self-assessment report and plan with corrective action schedule provide the framework for the JBEC Self-Assessment Program; however, the program is not fully developed and implemented. A review of the June 1992 Self-Assessment Program Manual in comparison with (1) the Secretarial guidance of July 31, 1990, (2) the ESMH Management Performance Objectives and Criteria for Tiger Team Management Assessments (August 15, 1991), and (3) the management appraisals by FE-6 and FE-60, indicate that, although the work completed to date represents a good first step, much work remains to be done to fully develop the Self-Assessment Program. The Tiger Team identified the following deficiencies in the Self-Assessment Program:

- JBEC did not develop and receive approval of its Self-Assessment Program Manual in a timely manner. This is due to the lack of timely guidance from DOE/NPOSR-CUW and DOE/NPOSR, the time expended to prepare the April 1992 self-assessment in response to the directive of the Director, NPOSR, and the focus of the staff on the scheduled Tiger Team Assessment.

- No formal performance-based training programs are indicated for the management systems that support the self-assessment process itself (e.g., trend analysis, root cause analysis, lessons learned, prioritization, and corrective action plans). JBEC's Self-Assessment Program Quality Assurance Standard (QAS-SAP)-5 provides for preparation and conduct of self-assessment training; however, it lacks specificity on training schedules, types of training in various fundamental self-assessment activities, and use of existing training courses.

- There is no methodology in the JBEC Self-Assessment Program Plan to ensure that limited resources are properly allocated to the most critical corrective actions or that the most critical corrective actions within a category are prioritized. Without such prioritization, limited resources cannot be used efficiently. Tracking and trending of corrective actions and findings from self-assessment activities are covered in JBEC QAS-SAP-6 and JBEC QAS-SAP-7; however, these procedures lack criteria for scheduling corrective actions which are currently based on time cycles rather than need. In addition, approved procedures do not specifically address the method of determining appropriate milestones and cost estimates for corrective action plans.

The plan lacks specificity in describing how outside assessments will be factored into the overall self-assessment activities or how routine walk-throughs and other related appraisals will be incorporated into the Self-Assessment Program. Similarly, the plan does not clearly establish linkage or coordination points between the operational activities of JBEC and the oversight role of DOE/NPOSR-CUW.

JBEC QAS-SAP-1 and JBEC QAS-SAP-4 lack specificity on the procedures by which Lead Assessors validate the closeout of corrective actions and findings. They also lack description of actions by the Lead Assessor for findings that were previously identified and closed out, but have since reoccurred. These procedures indicate that the Lead Assessor signs off on corrective actions, but it does not indicate where JBEC unit managers enter into the decision making process for corrective action closeout.

While limited implementation of the Self-Assessment Plan has taken place such as corrective action tracking, more work remains to be done before the program conforms to the Secretary's intent. Actual implementation is constrained by the following:

- The JBEC charter does not provide for an independent self-assessment office with independent oversight of self-assessment/ESMH functions. There is no clear plan that indicates how the JBEC self-assessment organization described in JBEC QAS-SAP-2 will maintain its independence when conducting Self-Assessment Program activities.

- Since the Self-Assessment Program Plan was completed just prior to the arrival of the Tiger Team, it has, for the most part, not been institutionalized and ownership of the various tasks has not been achieved at all levels of the organization.

The JBEC Self-Assessment Program Plan does not ensure independent verification and evaluation of the status and quality of ESMH performance and the self-assessment process, including the discharge of ESMH management responsibilities. There is no clear plan that indicates how this independent verification will be conducted through the use of external resources such as those available at the JBEC Houston, the corporate office. The plan also lacks specificity to how the JBEC self-assessment activities will be coordinated with those of the client, DOE/NPOSR-CUW, to avoid both organizations from proceeding in different directions with self-assessment activities, or corrective action plans.
The JBEC Self-Assessment Program Plan does not identify a methodology of how key findings, causal factors, and root causes will be developed for self-assessment activities. The plan does indicate that the Corrective Action Tracking and Trending System database will be used to track findings and corrective actions for self-assessment evaluations. However, the plan also does not call for the use of a prioritization system such as the Revised Tiger Team Action Plan Prioritization System as described in the Secretarial memorandum dated August 1, 1990.

Cross References
Findings MF-4, MF-5, MF-8, MF-9, MF-12, MF-13, MF-18, and MF-21

Self-Assessment
This finding is partially identified in the JBEC self-assessment (April 1992).

Management Appraisal
This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUM (June 1992) and was partially identified in the DOE/NPOSR Office of Planning and Technical Assurance management appraisal (May 1992).

6.8.2 Evaluation of JBEC Self-Assessment Report
FINDING SA-6 JBEC Self-Assessment Report
The JBEC April 1992 self-assessment report does not provide for the level of detail needed to establish a clear understanding of the deficiencies existing in the ES&H programs at NPOSR-CUM.

Discussion
The JBEC self-assessment was conducted between February and April 1992, resulting in a four-volume report last revised in April 1992. The assessment team correctly chose test of JBEC subject matter experts who conducted the assessment. A consulting firm provided some support in several environmental disciplines. The self-assessment report was fairly comprehensive in scope covering all DOE facilities and addressing all major areas in each ES&H discipline. The report included corrective actions, key findings, and root causes.

The JBEC Self-Assessment Team based their assessment primarily on the "Environment, Safety and Health Management Performance Objectives and Criteria (POCs) for Tiger Team Management Assessments" (August 15, 1991), the "Performance Objectives and Criteria for Technical Safety Appraisals at DOE Facilities and Sites" (June 1990), and "Performance Objectives and Criteria for Conducting DOE Environmental Audits." JBEC also utilized the services of a consulting firm which was selected and hired by DOE/NPOSR-CUM to assist in characterizing the, performance objectives and criteria (POCs) to provide a more site-specific criteria. However, the resulting product was literally unchanged from the DOE POCs. The self-assessment team performed the assessment by making a judgment as to whether their organization met the POCs.

At the direction of DOE/NPOSR-CUM, JBEC agreed not to attempt to validate most determinations by operating practices at current DOE projects and programs, systems, since many of the participants were familiar with field and programmatic conditions and were the same personnel who would be interviewed by an independent, outside auditing group.

The DOE POCs are intended to provide guidelines for a particular element, but not to provide specific guidelines for a detailed, site-specific assessment. Their use may result in capturing many ES&H deficiencies within functional and management areas. However, total reliance on the POCs will not provide the level of detail needed to establish a clear understanding of the deficiencies and how to effectively correct those deficiencies. In an effort to develop a comprehensive baseline, a self-assessment must include an extensive review of DOE Orders, Notices, Secretary of Energy Notices, rules, and regulations which relate to existing POCs.

Overall, the JBEC self-assessment report was extensive in scope, critical in nature, and reflected a management commitment to fully identify problems associated with their operations. To some extent, JBEC used other DOE site's Technical Safety Appraisal and self-assessment reports, thus using lessons learned from other facilities' experience. However, JBEC should ensure that it has a full understanding of its site-specific programmatic deficiencies, root causes, and the complexity of the corrective actions as corrective action plans, schedules, and budgets are developed and applied.

Other deficiencies in the self-assessment identified by the Tiger Team include the following:

Due to the small staff, JBEC and DOE/NPOSR-CUM agreed in advance that some self-assessment activities would be conducted by employees who have direct ES&H management and oversight responsibilities. As a result, the subsequent assessment was conducted in many instances by individuals who were responsible for the programs they were assessing. This is not consistent with the requirement for independence when conducting self-assessment activities.

A root cause was identified for each individual finding. However, there were not fully supported by a comprehensive root cause analysis. The root causes listed were generally an elaboration on the causal factors related to the individual finding and not the result of an in-depth analysis of those factors.

The findings listed in the Self-Assessment Report are generally under-developed and incomplete. The findings generally contain little or no discussion of the issue or a detailed explanation of the deficiency. The corrective actions written to respond to the findings, in many cases, also lack depth and a comprehensive explanation of the action to be taken with appropriate interim milestones. Each of these deficiencies suggests that JBEC must incorporate additional detail and analysis to their self-assessment evaluations.
Cross References

Findings MF-4, MF-8, MF-9, MF-12, MF-13, and MF-18

Self-Assessment

This finding was partially identified in the JPEC self-assessment (April 1992).

Management Appraisal

This finding was partially identified in the DOE Office of Self-Assessment management appraisal of NPOSR-CUW (June 1992) and was partially identified in the DOE/NPOSR Office of Technical Assurance management appraisal (May 1992).

A comparison of the Tiger Team findings to the JPEC findings is contained in Table 6-5.

### TABLE 6-5

<table>
<thead>
<tr>
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<tr>
<td>Safety &amp; Health</td>
<td>61 (68%)</td>
<td>19 (21%)</td>
<td>10 (11%)</td>
</tr>
<tr>
<td>Environmental</td>
<td>22 (36%)</td>
<td>25 (42%)</td>
<td>13 (22%)</td>
</tr>
<tr>
<td>Management</td>
<td>4 (30%)</td>
<td>8 (62%)</td>
<td>1 (8%)</td>
</tr>
<tr>
<td><strong>TOTAL</strong></td>
<td><strong>87 (53%)</strong></td>
<td><strong>52 (32%)</strong></td>
<td><strong>24 (15%)</strong></td>
</tr>
</tbody>
</table>

Specific areas addressed are covered in more detail in the sections that follow.

#### 6.8.2.1 Environment

In comparing the JPEC self-assessment findings with those identified by the Environmental Subteam, the subteam found that 22 were fully identified, 25 were partially identified, and 13 were not identified (see Table 6-4). As in the case of the DOE/NPOSR-CUW self-assessment, the programmatic deficiencies were generally well identified, but lacked specific details. However, they were more explicit than those which were in the DOE/NPOSR-CUW assessment. While there were more details in the JPEC assessment, there were also significant erroneous statements (e.g., finding E.WM.3A stated: "A small quantity generator permit was obtained from EPA"; however, there is no such permit). There were also incorrect regulatory statements (e.g., finding E.WM.11.E states that NPR-3 should have a contingency plan; this is not required). JPEC does not appear to have a thorough understanding of environmental regulatory requirements and issues pertinent to their facilities.

#### 6.8.2.2 Safety and Health

The JPEC self-assessment appeared comprehensive and critical. The "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites" (June 1990) served as a guide for the self-assessment process. Based on the use of criteria from these reference documents, the scope of the self-assessment was extensive. For each criterion, a finding was identified along with a statement of corrective action. Although these statements were generally clear, they were brief and did not provide sufficient detail to suggest an in-depth understanding of the deficiency. This may have been due to the limited participation by only a few JPEC staff members in developing the self-assessment report, and the use of an outside contractor in developing one of the technical areas (PT) in the Safety and Health self-assessment report. Such an approach limited the broader involvement of the organization and, thus, limited the depth of the JPEC response.

The self-assessment was candid as evidenced by the number of concerns that had been fully (68 percent) or partially (21 percent) identified in the self-assessment. Table 6-4 provides a comparison of the JPEC and Tiger Team Assessments as they relate to safety and health concerns.

Key findings were derived from the general findings and were analyzed for causal factors and root causes. The root causes appeared to address fundamental problems. Corrective actions reflected a general management commitment to correct problems, but lacked specificity and, thus, it was difficult to assess management's understanding of the actions and resources that will be required to correct identified deficiencies. The time allocated for corrective action did not appear realistic. For example, JPEC expects to implement a DOE-approved QA Program by September 30, 1992. The corrective actions proposed did not consider the impact that limited resources will have on implementing new programs and eliminating acknowledged deficiencies.

Overall, the JPEC self-assessment was extensive in scope, critical, and reflected a management commitment to identifying problems. A greater understanding of the deficiencies cited will be needed, however, before a realistic corrective action plan can be developed.

#### 6.8.2.3 Management

Similar to the DOE/NPOSR-CUW self-assessment, the JPEC self-assessment was a critical self-evaluation which included most of those deficiencies identified by the Management Subteam. Weaknesses in the JPEC self-assessment centered around exclusive use of management performance objectives and criteria for conducting the self-assessment, developing root causes, and establishing corrective actions. In the first instance, because base regulatory
requirements were not included as part of the criteria for conducting the self-assessment, it is possible that a number of deficiencies still remain unidentified. In the second instance, root causes identified were judged to be symptoms and not the underlying origins. As a result, if actions are limited to the identified symptoms, the true root cause will likely continue. Finally, the corrective action plan lacked specific elements or milestones, and the corrective action implementation schedule appeared to be overly optimistic.

6.9 REVIEW OF FE AND NPOSR MANAGEMENT APPRAISALS

Prior to the Tiger Team Assessment management appraisals were conducted by FE-6 of DOE/NPOSR and DOE/NPOSR-CUW, and FE-64 of DOE/NPOSR-CUW. Although these management appraisals are not self-assessment reports, they are part of the self-assessment programs for FE and DOE/NPOSR. Therefore, the Management Subteam compared its findings to the findings in the management appraisals. The results of this comparison are presented in Table 6-6.

<table>
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<th>Partially Identified</th>
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<td>FE Management Appraisal of DOE/NPOSR</td>
<td>0 (0%)</td>
<td>7 (88%)</td>
<td>1 (12%)</td>
<td>8</td>
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<td>FE Management Appraisal of DOE/NPOSR-CUW</td>
<td>7 (29%)</td>
<td>11 (46%)</td>
<td>6 (25%)</td>
<td>24</td>
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<tr>
<td>DOE/NPOSR Management Appraisal of DOE/NPOSR-CUW</td>
<td>9 (35%)</td>
<td>11 (42%)</td>
<td>6 (23%)</td>
<td>26</td>
</tr>
</tbody>
</table>

APPENDICES
Appendix A

ASSESSMENT TEAM PERSONNEL AND BIOGRAPHICAL SKETCHES

Appendix A-1

BIOGRAPHICAL SKETCHES OF TIGER TEAM ASSESSMENT TEAM LEADER AND TEAM LEADER STAFF
Figure A-1-1  NPOSR-CUW Tiger Team Organization
NAME: David P. Simonson
AREA OF RESP: Tiger Team Leader
ASSOCIATION: U.S. Department of Energy, Rocky Flats Office
EXPERIENCE:
- 26 Years
  U.S. Department of Energy, Rocky Flats Office
  - Senior Technical Advisor to the Manager.
  - Deputy Manager and Assistant Manager for Environmental Management. Managed the Rocky Flats Waste Management and Environmental Restoration Programs.
U.S. Department of Energy, Defense Programs, Headquarters
- Associate Deputy Assistant Secretary. Deputy to the Deputy Assistant Secretary responsible for management of the Department’s nuclear material production and defense program generated waste.
- Deputy Director, Office of Nuclear Materials Production. Responsible for management of the Department’s nuclear materials production program.
U.S. Department of Energy, Richland Field Office
- Director, Production Operations Division. Responsible for management of all production of nuclear materials at DOE’s Hanford Site.
- Project Manager, SIS. Managed the Special Isotope Separation Project, a billion dollar project to develop and build a facility to separate plutonium isotopes for use in nuclear weapons.
- Other management and engineering positions in reactor design, construction, and testing.
EDUCATION: B.S., Mechanical Engineering, New Mexico State University
M.S., Nuclear Engineering, Massachusetts Institute of Technology

NAME: Ann E. Davis
AREA OF RESP: Administrative Assistant to Tiger Team Leader
ASSOCIATION: U.S. Department of Energy, Rocky Flats Office
EXPERIENCE:
- 11 Years
  U.S. Department of Energy, Rocky Flats Office - Office of Assistant Manager for Environmental Management. Secretarial and administrative support to the Assistant Manager for environmental restoration and waste management activities at the Rocky Flats Plant.
  U.S. Department of Energy, Richland Field Office - Financial Resources Division, Procurement Division, and Office of the Manager.
Bookkeeping and records auditing for private industry.
EDUCATION: Work-related and computer software training, and NISC independent study courses.
NAME: Mary Meadows

AREA OF RESP: Tiger Team Administrator

ASSOCIATION: U.S. Department of Energy, Headquarters

EXPERIENCE: 32 Years

U.S. Department of Energy

- Supervisory Appraisal Specialist: Responsible for the overall planning and conduct of Tiger Team Assessments, Technical Safety Appraisals, Management Appraisals, Nuclear Safety Program Appraisals, Design Reviews, and Comprehensive Appraisals. Responsible for the overall production for draft reports in the field and final publication of reports at DOE Headquarters; also for providing coordination and editorial support on DOE/EH appraisals.

- Staff Assistant, Office of Environmental Compliance and Overview. Recommended specific changes in administrative procedures for the purpose of increasing efficiency, eliminating unnecessary details, and providing needed management control.

- Staff Assistant, Office of Bio-Medical and Environmental Research. Obtained and communicated information to organizations and individuals inside/outside the Agency on a wide range of Agency organization, personnel, and procedures.

- Staff Assistant, Office of the Commissioner, USAEC.

- Administrative Assistant, Office of the Assistant General Manager for Research and Development, USAEC.

Other Related Experience

- Administrative and conference planning responsibilities within the USAEC, ERDA, and DOE.

EDUCATION: Numerous work-related courses and workshops at various colleges, training centers, SSDC, and the American Management Association.

OTHERS: Member, U.S. Delegation to Disarmament Conference, Geneva, Switzerland
NAME: Atam P. (Al) Sikri

AREA OF RESP: Environmental Subteam Leader

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 24 years

- U.S. Department of Energy, Office of Environmental Audit
  - Team Leader and Environmental Engineer, Office of Environmental Audit. Provides guidance, direction, and assistance to a multi-disciplined group of professionals performing Environmental Audits and Assessments at DOE facilities. Participated as the Environmental Subteam Leader for the Ames Laboratory and Stanford Linear Accelerator Center Tiger Team Assessments; Team Leader for the West Valley Demonstration Project Environmental Audit; and Assistant Subteam Leader for the Sandia National Laboratories, Tiger Team Assessment.
  - Assessment and Validation Engineer, Office of Program/Project Management. Provided independent appraisal of projects involving design/construction, environmental aspects planning/scheduling, and cost estimating. Also, NEPA Compliance Officer for the Office of Procurement.
  - Program Manager/Assistant Director, Office of Fossil Energy. Responsible for directing and managing synthetic fuel research, development, and demonstration of technologies. Processes were developed in full compliance with environmental regulations.
  - General Engineer, Office of Defense Programs. Worked with uranium enrichment technology, project management, and classification determination capability.

- Other Experience
  - Petroleum Engineer, U.S. Corps of Engineers. Work involved process design, project engineering, and cost study.
  - Senior Process Design/Development Engineer. Have worked with DuPont Company, Cities Service Company (now part of Occidental Petroleum Corporation), Johnson & Johnson, and Hoffmann-LaRoche, Incorporated.

EDUCATION:
- Ph.D., Chemical Engineering, University of Pennsylvania
- M.S.E., Chemical Engineering, University of Michigan
- B.S.E., Metallurgical Engineering, University of Michigan
- B.S.E., Chemical Engineering, University of Michigan

OTHER: Registered Professional Engineer

NAME: Leroy H. Banicki

AREA OF RESP: Deputy Environmental Subteam Leader

ASSOCIATION: U.S. Department of Energy

EXPERIENCE: 14 years

- U.S. Department of Energy, Office of Environmental Audit, Washington, DC
  - Environmental Protection Specialist responsible for providing guidance, direction, and assistance to a multi-disciplined group of professionals performing Tiger Team Assessments and Environmental Audits at DOE facilities.

- Headquarters, Air National Guard, Andrews AFB, Maryland
  - Project Officer for Installation Restoration Program activities at Air Guard bases nationwide.

- White Sands Missile Range, New Mexico
  - Deputy Director, Environmental and Natural Resources Office, with responsibility for hazardous waste, asbestos abatement, spill control and countermeasures, and environmental training programs.

- Department of the Army, Ft. Carson, Colorado
  - Environmentalist, responsible for hazardous waste, asbestos abatement, cultural and natural resources programs.

- Army Corps of Engineers, Jacksonville, Florida
  - Biological Scientist, responsible for Environmental Assessment/Environmental Impact Statement preparation and endangered species programs.

- Department of Agriculture, Soil Conservation Service, Prosser, Washington
  - Soil Conservationist.

- Menominee Indian Nation, Neopit, Wisconsin
  - Forest Inventory Specialist.

EDUCATION:
- Graduate Studies, Forest Pathology, Louisiana State University
- M.S., Biology, University of Texas at El Paso
- B.S., Wildlife Management, McNeese State University
NAME: William N. Hasselkus
AREA OF RESP: Deputy Environmental Subteam Leader
ASSOCIATION: U.S. Department of Energy
EXPERIENCE: 21 years
• U.S. Department of Energy, Office of Environmental Audit
  - Environmental Engineer responsible for providing guidance, direction, and assistance to a multi-disciplined group of professionals performing Tiger Team Assessments and Environmental Audits at DOE facilities.
  - Environmental Engineer supporting environmental compliance support to DOE National Laboratory and ancillary facilities.
  - Environment, Health and Safety Manager providing ES&H support for the Program Office for construction of the world’s largest particle accelerator. Co-manager of the Environmental Impact Statement for the project.
• Booz, Allen and Hamilton, Inc., Consultants
  - Area manager supporting Superfund policy development for the Environmental Protection Agency, and area manager for environmental compliance support for EPA’s facilities, primarily through leading environmental audit teams.
• U.S. Army Materiel Command
  - Chief, Environmental Quality Division, responsible for environmental compliance oversight and guidance. In this capacity, developed and implemented the Command’s Environmental Auditing program. This position also involved operation of the Army’s Installation Restoration Program.
• U.S. Army Environmental Hygiene Agency
  - Sanitary Engineer serving as project leader for industrial and domestic wastewater investigations conducted by teams of professionals at Army facilities.
• U.S. Army Electronics Command
  - Served as the original facility environmental coordinator at Fort Monmouth, N.J.
EDUCATION: MBA, Fairleigh Dickinson University
B.S., Chemical Engineering, New Jersey Institute of Technology
Executive Excellence Program, Federal Executive Institute Program for Senior Executives, MIT

NAME: Raeann Reid
AREA OF RESP: Group Coordinator
ASSOCIATION: Arthur D. Little, Inc.
EXPERIENCE: 20 years
• Arthur D. Little, Inc.
  - Group Coordinator for the Tiger Team Assessments of the Energy Technology Engineering Center, the Naval Petroleum Reserves in California, and the Strategic Petroleum Reserves and Deputy Coordinator for the Idaho National Engineering Laboratory Tiger Team Assessment.
  - Led and participated in audits and risk assessments for several Arthur D. Little clients, primarily in the petrochemical and petroleum industries including oil refineries, oil terminals, and production facilities.
• Other Industry Experience
  - Twenty years experience including environmental operations; environmental regulatory affairs; industrial and commercial hazardous waste management, site evaluation, remediation and offsite disposal; and industrial and commercial laboratory management.
  - While working for a major petrochemical manufacturer, audited toll manufacturers, bulk terminals, repackaging plants, recyclers, and commercial disposal facilities.
  - In the oil industry, worked as a refinery environmental supervisor, evaluated the department audit program for a major exploration and production company, evaluated environmental risks associated with abandoned oil production sites for a lessor, led and participated in environmental audits of refineries and bulk terminals for four major oil companies.
EDUCATION: B.S., Mathematics, Minor Chemistry, Texas Technological University
NAME: Lynne Day
AREA OF RESP: Environmental Subteam Administrative Support
ASSOCIATION: META
EXPERIENCE: 15 years

- META

- INNOVA Communications, Inc.
  - Office Administrator. Provided system and documentation support for a local and wide area network integration firm. Worked on office automation systems configuration analysis project providing technical writing and project management support. Responsible for development of instruction materials, graphics support, manuals, and vendor documentation. Prepared proposals, presentations, graphics, and technical drawings. Compiled and prepared statistical data for price quotations, cost proposals, analysis, and reporting.

- Sandler & Greenblum
  - Word Processing Departmental Manager. Developed and coordinated activities related to the word processing department for law firm specializing in patent/trademark law. Responsible for development of instruction materials, graphics support, manuals, and vendor documentation. Prepared proposals, presentations, graphics, and technical drawings. Compiled and prepared statistical data for price quotations, cost proposals, analysis, and reporting.

EDUCATION: A.A., Computer Science, Strayer College, Arlington, VA

NAME: Joseph Delaney
AREA OF RESP: Inactive Waste Sites
ASSOCIATION: Arthur D. Little, Inc.
EXPERIENCE: 8 years

- Arthur D. Little, Inc.
  - Surface water/drinking water specialist for the Tiger Team Assessments of the Naval Petroleum Reserves in California, the Pittsburgh Energy Technology Center, the Strategic Petroleum Reserve, and the Fermi Laboratory; assisted on the Stanford Linear Accelerator Center Tiger Team Assessment.

  - Participated in a number of environmental audits for commercial clients. Specialized in the assessment of compliance with surface water, drinking water, spill prevention, and hazardous waste regulations.

  - Prepared a Toxic Substances Control Act (TSCA) training manual to address the major provisions of TSCA, including asbestos and polychlorinated biphenyl (PCB) management.

- Environmental Consultant
  - Conducted a variety of studies assessing the impact of process wastewater discharges on receiving water quality. These studies included characterization of waste streams, thermal impact assessment, and water quality modeling in support of National Pollutant Discharge Elimination System permit applications.

  - Participated in several sampling programs for the Army Corps of Engineers to assess PCB discharges and dredge material disposal sites.

  - Prepared and updated Spill Prevention Control and Countermeasure Plans and Emergency Response Plans to address oil and hazardous materials spills from several industrial sites.

EDUCATION: B.S., Civil Engineering, Northeastern University
OTHER: Registered Professional Engineer
NAME: Richard D'Ermilio

AREA OF RESP: Toxic and Chemical Materials

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 7 years

- Arthur D. Little Inc.
  - Participated in the Pittsburgh Energy Technology Center, Solar Energy Research Center, Los Alamos National Laboratory, Oak Ridge K-25 Site, and the Fermi Laboratory Tiger Team Assessments as a waste management specialist for the Environmental Subteams. Also, participated as a waste management specialist in the Progress Assessment at the Oak Ridge Y-12 Site.

- A. W. Chesterton Company
  - Responsible for the corporate hazardous and special waste management program, including identification and characterization of hazardous wastes, formulating and implementing a waste tracking program, and managing empty containers.
  - Developed and implemented facility-specific emergency contingency planning procedures.
  - Developed corporate underground storage tank (UST) management program.

- Chemical Waste Management

- S.E.T. Environmental
  - Managed a project for Commonwealth Edison of Illinois which involved the removal of soils and decontamination of sites contaminated with polychlorinated biphenyls (PCBs).

EDUCATION: M.S., Hazardous Materials Management, Tufts University (in progress)
B.A., in Environmental Science, State University of New York College at Purchase

NAME: Richard B. Lynch

AREA OF RESP: Technical Editor

ASSOCIATION: META

EXPERIENCE: 5 years

- META
  - Technical Editor. Provides technical editing and graphics support to the Environmental Subteam during Tiger Team Assessments. Also, oversees the preparation of the camera-ready copy of final assessment reports and audit reports for DOE's Office of Special Projects and Office of Environmental Audit.
  - Writer/Editor. Provides technical writing and editing support for DOE's Office of New Production Reactors (NPR), including writing NPR's Correspondence Manual and a variety of technical articles for publication.

- Advanced Sciences, Inc.
  - Writer/Editor. Researched, wrote, and edited fact sheets and information briefs on energy conservation and renewable energy topics for a DOE-funded energy information service.
  - Response Analyst/Media Liaison. Analyzed and researched inquiries on energy topics from the general public, U.S. Congress, and trade associations. Also, wrote information briefs, press releases, and assisted with media outreach activities.

EDUCATION: B.A., General Studies, Louisiana State University
NAME: Donald Neal
AREA OF RESP: Waste Management
ASSOCIATION: Arthur D. Little, Inc.
EXPERIENCE: 9 years

- Arthur D. Little, Inc.
  - Provides technical guidance to commercial clients on hazardous waste recycling and disposal.

- CSI Resource Systems Inc.
  - Managed environmental permitting of waste management facilities including environmental impact assessments; air, water, and solid waste permits.
  - Prepared solid and hazardous waste management plans for industry and municipalities.
  - Evaluated waste management facility compliance with environmental permits and regulations.
  - Investigated methods for air pollution monitoring, air emissions control, and source testing, for independent engineering evaluations and other interested parties.

- ENSR Consulting Engineering
  - Managed environmental assessments and permitting of industrial facilities including solid and hazardous waste, power generation, cogeneration, pulp and paper, and natural gas storage and transmission.

- GCA Technology Division
  - Project manager for quality assurance for 1985 National Acid Precipitation Assessment Program (NAPAP) emissions inventory.
  - Designed and implemented Continuous Emissions Monitoring System for air emission sources.

EDUCATION: M.S., Biology, University of Massachusetts
            B.S., Biology, University of Massachusetts

NAME: John J. Pulliam III
AREA OF RESP: National Environmental Policy Act (NEPA) Coordinator
ASSOCIATION: U.S. Department of Energy
EXPERIENCE: 23 years

- U.S. Department of Energy
  - Environmental Protection Specialist, Project Activities Division and Waste Activities Division. Determines the required NEPA document for DOE projects. Reviews Environmental Impact Statements and Environmental Assessments for accuracy and adequacy. Develops NEPA compliance policies and guidance.

- U.S. Fish and Wildlife Service
  - General Biologist. Recommended species to be added to the List of Endangered and Threatened Species over a four state area.
  - Fishery Biologist/Fish and Wildlife Biologist. Analyzed water resource development projects to determine their impact on fish and wildlife resources and recommended mitigation for those impacts. Utilized Habitat Evaluation Procedures and remote sensing. Participated in river basin planning.
  - Fishery Biologist. Worked as a hatchery biologist and then assistant manager at four National Fish Hatcheries in three states. Propagated warm water fish and trout, including disease diagnosis and control. Prepared reports, paid bills, kept records, and performed other administrative functions.

EDUCATION: M.S., Biology, University of Southwestern Louisiana
            B.S., General Agriculture, New Mexico State University
NAME: James J. Rea
AREA OF RESP: Groundwater/Soils, Sediments, and Biota
ASSOCIATION: Arthur D. Little, Inc.
EXPERIENCE: 9 years
  • Arthur D. Little, Inc.
    - Participated in the Tiger Team Assessments of the Oak Ridge K-25 Site, Los Alamos National Laboratory, and Solar Energy Research Institute (SERI) as the lead groundwater/soils, sediments, and biota specialist. Additionally, participated in the Tiger Team Assessment of the Strategic Petroleum Reserve as a surface water/drinking water specialist and for the SERI Tiger Team Assessment as the inactive waste sites specialist.
  • Briggs Associates, Inc.
    - Environmental Scientist with responsibilities of Project Manager. Conducted land transfer site assessments; emergency response spill/site assessments; remedial investigation/remedial design; regulatory agency interfacing, including compliance management of RCRA, CERCLA, SARA, TSCA, and National Pollutant Discharge Elimination System permitting; underground storage tank management; surface and subsurface investigation; hydrogeologic contaminant flow conditions; surveying and field mapping.
  • Chem-Nuclear Systems, Inc.
    - Lead Health Physics Technician to support the U.S. Department of Energy's UHTRA Projects. Responsible for radiological engineering assessments; personnel and environmental dosimetry; decontamination; site and vicinity property excavation control; and radionuclide laboratory analysis.
  • Benson, Motin and Greer Drilling Company
    - Drilling Fluid Engineer. Responsibilities included the design and maintenance of the drilling fluid programs for secondary recovery oil wells and natural gas injection wells.
EDUCATION: Graduate Studies, Hydrogeology and Environmental Studies, University of Montana
B.S., Conservation Science, Fort Lewis College
OTHER: Member of the American Chemical Society and Plenary Membership in the Health Physics Society

NAME: William G. Rhodes
AREA OF RESP: Radiation
ASSOCIATION: Arthur D. Little, Inc.
EXPERIENCE: 12 years
  • Arthur D. Little, Inc.
    - Participated in Tiger Team Assessments, an Environmental Audit, a Line Management Environmental Audit, and a Progress Assessment at various DOE facilities, including Los Alamos National Laboratory, Sandia National Laboratory, Albuquerque, West Valley Demonstration Project, and the Hanford Site.
    - General Electric Company, Knolls Atomic Power Laboratory
      - Lead Engineer. Responsible for the radiological environmental monitoring for the laboratory and quality assurance for some environmental surveillance activities for U.S. Navy facilities. Supervised a three-site action program to ensure each site complied with Environmental Protection Agency radionuclide emission standards.
      - Lead Health Physicist. Responsible for supervising internal, external, and environmental dosimetry for the laboratory.
      - Radiological Engineer. Conducted inspections and audits of various radiological facilities, including prototype reactor sites, radiochemistry laboratories, radioactive waste processing and storage facilities, fuel fabrication facilities, hot cell laboratories, and x-ray and radiography facilities. Also responsible for various radiological engineering tasks, such as approving radiological procedures, decontamination and decommissioning, soil characterization studies, and air sampling applied research and development.
EDUCATION: M.S., Radiological Sciences and Protection, University of Massachusetts at Lowell
R.T. (ARRT), Registered Radiological Technologist, Wittenberg University and Mercy Medical Center
B.A., Physics and Biology (Dual Major), Wittenberg University
OTHER: Certified Health Physicist, American Board of Health Physics
NAME: Lorene L. Sigal, PhD.
AREA OF RESP: National Environmental Policy Act
ASSOCIATION: Oak Ridge National Laboratory
EXPERIENCE: 12 years
- Oak Ridge National Laboratory
  - Participated in 13 Tiger Team Assessments.
  - Prepared terrestrial ecology sections of environmental impact statements for coal-fired, oil-fired, and nuclear power plants; U.S. Army disposal of chemical agents and munitions; and U.S. Air Force base closures and reuse.
  - Technical assistance to the DOE Office of NEPA Oversight.
  - Development of the draft DOE NEPA Compliance Guide and the DOE NEPA Compliance Audit Protocol.
  - Preparation of the DOE Regulatory Compliance Guide for Prevention of Significant Deterioration under the Clean Air Act.
  - Team Leader for Oak Ridge National Laboratory environmental compliance assessments for the U.S. Air Force under their Environmental Compliance and Management Program (ECAMP).
  - Basic research in the effects of air pollutants on vegetation.
EDUCATION: Ph.D., Botany and Microbiology, Arizona State University
          M.A., Systematic Biology and Ecology, San Francisco State University
          B.A., Art, Stanford University

NAME: Sarah J. Simon
AREA OF RESP: Air
ASSOCIATION: Arthur D. Little, Inc.
EXPERIENCE: 20 years
- Arthur D. Little, Inc.
  - Participated in the Pittsburgh Energy Technology Center, Oak Ridge K-25 Site, and Ames Laboratory Tiger Team Assessments as air specialist for the Environmental Subteam.
  - Performed environmental risk/liability assessments for pulp and paper, electrical connector, and manufacturing facilities. Coordinated risk assessment teams.
  - Presented session on excellence in environmental management systems.
- Massachusetts Division of Air Quality Control
  - Directed the air quality assessment programs including monitoring, modeling, and emission inventories. Planned and developed an air toxic monitoring program. Procured a mobile laboratory and data acquisition system.
  - Provided air program liaison and developed recommendations for new programs addressing site cleanup and multi-media permits and operations; network computer systems; and legislative commissions on lead and indoor air pollution.
- U.S. Environmental Protection Agency, Region I
  - Evaluated state air programs. Reviewed technical and regulatory adequacy of energy facility emission limits; emission inventories; state implementation plan submittals; and acid deposition programs.
  - Reviewed Federal air and water permit applications and grants; audited state programs; and performed compliance inspections.
EDUCATION: M.S., Environmental Engineering, Northeastern University
          B.S., Civil Engineering, Massachusetts Institute of Technology
NAME: Clifford H. Summers

AREA OF RESP: Surface Water

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 31 years
- Arthur D. Little, Inc.
  - Performed inspections and audits for a variety of clients, both commercial and government, in areas such as aerospace manufacturing, power generation, and chemical and petrochemical manufacturing.
  - Supported a commercial client in remedial planning to ensure compliance with the Clean Water Act and National Pollutant Discharge Elimination System (NPDES) regulations, including development and implementation of sampling programs, preparation of a water pollution control manual, preparation of an application for an NPDES permit modification, and assistance in negotiations with state regulators.
  - Resident Environmental Coordinator on Johnson Island for the Army Chemical Demilitarization program. Responsible for preparation and implementation of environmental compliance plans by the Operations and Maintenance Contractor. Oversight responsibility for five environmental engineers and five plant operations departmental staff.

EDUCATION: Graduate Studies at Louisiana State University and Northeastern University
A.B., Chemistry, Florida State University

NAME: Joseph Swiniarski

AREA OF RESP: Quality Assurance

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 30 years
- Arthur D. Little, Inc.
  - Participated in the Tiger Team Assessments of the Idaho National Engineering Laboratory and Energy Technology Engineering Center as the quality assurance specialist. Also participated in Tiger Team preassessments of the Laramie Energy Technology Center and Oak Ridge Gaseous Diffusion Plant.
  - Evaluated quality assurance capabilities and good laboratory practices compliance for testing laboratories of a major U.S. cosmetics company.
  - Consultant and experimental preclinical therapeutic and toxicologic scientist (1963-present) with broad experience in laboratory management, radiation biology, and quality assurance monitoring within Arthur D. Little, Inc. Life Science Section. Responsibilities included managing contract work for the U.S. National Cancer Institute and the U.S. Army.

EDUCATION: M.A., Physiology, Minor, Biology, Boston University
B.S., Biology, Minor Chemistry, Northeastern University
NAME: Helen C. Walters

AREA OF RESP: Environmental Subteam Administrative Support

ASSOCIATION: META

EXPERIENCE: 25 years

• META
- Information Processing Specialist. Provides administrative support to the Environmental Subteam on DOE Tiger Team Assessments and overall support to DOE’s Office of Special Projects. Participated in Tiger Team Assessments of the Sandia National Laboratory, Albuquerque; Morgantown Energy Technology Center, Idaho National Engineering Laboratory, Pittsburgh Energy Technology Center, Los Alamos National Laboratory, the Naval Petroleum Reserves in California, the Strategic Petroleum Reserves, the National Institute for Petroleum and Energy Research, and the Fermi Laboratory. Participated in the Environmental Audits of the Uranium Mill Tailings Remedial Action Project and the Component Development and Integration Facility. Provides administrative support for final Tiger Team and environmental audit reports.

• Cate & Associates, Chartered
- Administrator. Served as Executive Assistant with administrative responsibilities for filing estate accounting in excess of $125,000 to the Commissioner of Accounts; liaison with attorneys and the courts with regards to these accounts; and handled accounts receivable and payable.

• National Council of Farmer Cooperatives
- Administrator. Responsible for administration of financial and human resources for a staff of 13 professional and 13 support staff. Duties in the area of finance included the preparation and oversight of an annual operating budget of $2.5 million with reporting responsibility to a committee composed of board members. Duties in the area of human resources included hiring and training of all support staff, and developing and coordinating employee benefits packages. Responsible for accommodating 65 employees in newly constructed, 17,000-square-foot office space.

EDUCATION: B.S., Business, Kent State University

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Appendix A-3

BIOGRAPHICAL SKETCHES OF SAFETY AND HEALTH SUBTEAM MEMBERS

NAME: Leonard M. Lojek

AREA OF RESP: Safety and Health Subteam Leader

ASSOCIATION: Office of Performance Assessment, Headquarters, Department of Energy

EXPERIENCE: 33 Years

- U.S. Department of Energy, Washington, DC
  - Safety and Health Subteam Leader for Tiger Team Assessments and Team Leader for Technical Safety Appraisals. Leader or team member on 16 TSAs.
  - Quality Assurance Manager, Assistant Secretary for Environment, Safety and Health.
  - Quality Assurance Program Manager, Assistant Secretary for Fossil Energy.
  - Program Manager of R&D efforts in Solvent Refined Coal Conversion Programs (SRC-I and SRC-II), Assistant Secretary for Fossil Energy.

- Chemical Systems Laboratory, DOD
  - Project Manager and Project Engineer for disposal of obsolete toxic chemical munitions.
  - Product Engineer for smoke and pyrotechnic chemicals, and for riot control chemicals. Process Engineer for plasticized white phosphorus munitions.

- Calgon Corporation
  - Technical Service Engineer for industrial and utility water treatment systems.

EDUCATION: M.S.A., Management Engineering, George Washington University  
B.S., Chemical Engineering, Carnegie-Mellon University

OTHER: Member, American Institute of Chemical Engineers  
Member, American Society of Quality Control  
Member, American Defense Preparedness Association
NAME: George P. Bailey

AREA OF RESP: Emergency Preparedness and Fire Protection

ASSOCIATION: Advanced Systems Technology, Inc.

EXPERIENCE: 31 Years

- Advanced Systems Technology, Inc.
  - Manager, Emergency Preparedness.
- Stone & Webster Engineering Corp.
  - Senior Emergency Planning Analyst.
- Public Service of Indiana
  - Senior Emergency Preparedness Licensing Engineer, Marble Hill, Nuclear Generating Station.
- Louisiana Power & Light
  - Site Emergency Planning coordinator, Waterford 3, Steam Electric Station.
- Nuclear Energy Services, Inc.
  - Manager, Protective Services.
- AIG Consultants, Inc.
  - Senior Staff Loss Control Engineer. Conducted fire, liability, and workers compensation safety survey of petro-chemical plants and refineries.
- U.S. Air Force Retired
  - Onsite Controller, Nuclear Emergency Team.

EDUCATION: University of Philippines
- Tunxis Community College
- Hartford State Vocational College
- NET Course, Sandia Base, New Mexico
- Disaster Preparedness Instructor Course
- CBR Warfare Instructor Course

OTHER: AIF - Former Member, Subcommittee on Siting, Licensing and Emergency Preparedness
- AIF - Former Member, Subcommittee on Safeguards
- Member, Society of Fire Protection Engineers

NAME: Jimmy E. Biggs


ASSOCIATION: Biggs Associates

EXPERIENCE: 34 Years

- Tarrant County Water Control and Improvement District
- Biggs Associates
- International Colombia Resources Corporation (Mining)
  - Fire Protection Division Manager: Responsible for corporate fire protection and rescue.
  - Manager of Industrial Safety Division: Responsible for corporate safety, fire protection, first aid, rescue and industrial hygiene
- Exxon Services Venezuela (Petroleum)
  - Technical Advisor, Fire Protection.
- Half Moon Bay Fire Protection District (Municipal)
  - Fire Chief of a California Fire Protection District
- Redwood City Fire Department (Municipal)
  - Fire Inspection and Arson Investigation: Performed safety construction inspections, investigated fires and made recommendations for prevention.
- Naval Supply Center Fire Department
  - Performed building, fire and ship inspections.
- U.S. Naval Air Station - Fire Department
  - Fireman, Pump Operator and Officer: Structural fire department operations for a U.S. Navy installation in Japan.

EDUCATION: A.A., Fire Science Technology, College of San Mateo, California
- Postgraduate work for Fire Science Program
- Standard Designated Teaching Credential in Vocational Trade and Technical Teaching in Fire Science (Lifetime Certificate No. VPL 1254 State of California)
- Business Administration and Premedical Studies, City College of San Francisco

NAME: Pamela A. Claps
AREA OF RESP: Worker Safety/OSHA 1B Specialist
ASSOCIATION: Murphy & Associates
EXPERIENCE: 3 years
- Murphy & Associates
  - Participated in Solar Energy Research Institute and the Naval Petroleum Reserves in California Tiger Team Assessments and the Portsmouth Gaseous Diffusion Plant OSHA Inspection.
  - Assisted in industrial hygiene sampling.
  - Assisted in conducting safety inspections.
  - Knowledgeable in OSHA standards and researched appropriate OSHA standards violation.
  - Developed OSHA-modified 1B's.
  - Developed report formats.
  - Performed computer programming, data input, and Beta testing as part of DOE Technical Safety Appraisals.
EDUCATION: Course work in Engineering Design and Computer Technology, Colorado State University

NAME: Robert J. Cordes
AREA OF RESP: Operations/Site-Facility Safety Review
ASSOCIATION: Robert J. Cordes & Associates
EXPERIENCE: 34 years
- Robert J. Cordes & Associates
  - Principal. Provides petroleum industry safety consultant services, including expert witness, inspections, investigations, and program development.
- Marathon Oil Company
  - Safety Supervisor, Safety and Training Coordinator, and Environmental and Safety Coordinator. Responsible for the safety, training, and environmental aspects of Marathon's production operations in the Gulf of Mexico.
  - Senior Risk Engineer. Responsible for inspecting refineries, gas plants, product terminals, fuel gas plants, pipeline terminals and production, both offshore and onshore.
  - Safety Representative, Supervisor of Safety and Security. Responsible for safety during a $100 million plant expansion at 200,000 B/D refinery.
  - Design Engineer. Involved with selection, design, and operation of refinery equipment.
  - Process Engineer. Daily involvement with operations at refinery process units.
EDUCATION: B.S., Mechanical Engineering, Washington University, St. Louis, Missouri
OTHER: Certified Safety Professional
  - Member, ANSI Z244 Lockout/Tagout Standard Committee
  - Member, ANSI Z117 Confined Space Entry Standard Committee
  - Member, American Society of Safety Engineers
  - Advisory Member, American Petroleum Institute, Safety and Fire Protection Committee
  - President, Society of Ohio Safety Engineers (1978-1979)
NAME: David M. Drury

AREA OF RESP: Worker Safety and Health (OSHA) Compliance

ASSOCIATION: Private Consultant

EXPERIENCE: 8 Years

- Private Consultant
  - Participant in Technical Safety Appraisal (TSA) Tiger Team Assessments.
  - Lead Worker Safety Appraiser for 3 Tiger Team Assessments.
- Monterey Coal Company (MCC) (subsidiary of Exxon, USA)
  - Training Specialist: Coordinating and documenting training requirements and individualized assessments for training.
  - Safety Specialist: Analyzed MCC accident statistics, maintained MSHA CFR 30 updates, maintained Illinois Right-to-Know law requirements including MSDSs. Provided oversight and guidance for accident investigations.
- Health and Safety Technician: Maintained all health monitoring equipment, conducted air quality and noise sampling, fire protection audits, and self rescuer audits.
- Safety Inspector: Loss control system, Computer Loss Control Surveillance System, MSHA inspections and worker safety audits; and emergency preparedness system. Conducted Accident Investigations.
- Exxon U.S.A.
  - Field Safety Coordinator, Valdez Oil Spill: Conducted state and Federal OSHA inspections of all facilities (barges, petroleum storage areas, vessels, food handling, etc.); worker safety and equipment audits.

EDUCATION: B.S., Industrial Technology, Southern Illinois University

OTHER: Ansin Industrial Fire School
  National Safety Council Congress & Exposition
  Mine Emergency Preparedness
  Loss Control Management Training
  Loss Control Surveillance System (data processing)
  MSHA Inspector Certifications
  MSHA Electrical Qualifications
  Emergency Medical Technician (EMT-I)
  OSHA 24 Hour Hazard Material Certification
  OSHA Voluntary Compliance Instructor

NAME: Gary J. Gottfried

AREA OF RESP: Occupational Safety

ASSOCIATION: Apex Environmental, Inc.

EXPERIENCE: 17 Years

- Apex Environmental, Inc.
  - Principal, Industrial Hygienist: Responsible for conducting industrial hygiene, public/occupational health and safety and environmental programs.
  - Manages and performs studies involving asbestos programs, indoor air quality, environmental audits, industry exposure assessment and control, hazard assessment and control, health and safety program development/implementation, and industrial hygiene surveys; concentration in the petroleum industry, utilities, and laboratory environments.
  - Project Manager for Mobil Oil Health and Safety Services Contract. Technical appraiser for DOE Technical Safety Appraisals and Tiger Team Assessments in disciplines of Occupational Safety, Industrial Hygiene, and Personnel Protection. Participated in 12 appraisals including NPR, SPR, LANL, INEL, and ANL-E.
- Biospherics Incorporated
  - Vice President, Laboratory and Industrial Hygiene Services: Responsible for operations of the Industrial Hygiene and Laboratory Divisions, including management of financial performance, business development, protocol development, productivity, technical direction and supervision of over 100 Industrial Hygienists, Chemists, and Environmental Scientists.
  - Managed major industry and government contract efforts; performed technical programs as an industrial hygienist, and chemist; led industrial hygiene surveys, laboratory studies, and health and safety programs; concentration in the petroleum industry, utilities, laboratories, and manufacturing facilities.
  - Principal Investigator for API Industrial Hygiene Monitoring Studies.

EDUCATION: B.S., Chemistry, Purdue University

OTHER: Certified Industrial Hygienist by the American Board of Industrial Hygiene, 1983
  EPA Accredited Asbestos Inspector and Management Planner President, AIHA, Potomac Section, 1985-1986
  Vice President, AIHA, Potomac Section, 1984-1985
  Treasurer, AIHA, Potomac Section, 1987-1989
NAME: Lydia G. Guerra
AREA OF RESP: Coordinator, Safety and Health
ASSOCIATION: M.H. Chew and Associates
EXPERIENCE: 14 Years
  • M.H. Chew and Associates
    - Administrative Assistant to Tiger Team Leader of the Tiger Team Assessment at the Strategic Petroleum Reserve Project Management Office and the Los Alamos National Laboratory (LANL): Responsible for assisting Tiger Team Leader with communications, weekly and monthly reports, schedules, and administrative support.
    - Report Coordinator for the overall coordination and production of the draft report at the Princeton Plasma Physics and Ames Laboratories.
    - Report Coordinator for the Safety and Health Subteam Reports of the Tiger Team Assessments at the Idaho Chemical Processing Plant, Lawrence Berkeley Laboratory, Pittsburgh Energy Technology Center, Princeton Plasma Physics Laboratory, LANL, and Oak Ridge K-25 site.
  • Westinghouse Idaho Nuclear Company, Inc.
    - Report Coordinator for the Safety and Health Subteam Reports of the Tiger Team Assessments at the Savannah River Site, Pinellas Plant, and Brookhaven National Laboratory.
    - Report Coordinator for Technical Safety Appraisal Reports at Oak Ridge National Laboratory, Strategic Petroleum Reserve Site, and Oak Ridge Y-12 Plant TSA Followup.
    - Manager, Information Processing Services, responsible for the management direction and operation of two centralized Information Processing Centers.
EDUCATION: B.S., Education; Corporate Training, Idaho State University
OTHER: Certified Instructional Trainer, Corporate Training Word Processing Instructor, Eastern Idaho Technical College

NAME: Janice E. Hill
AREA OF RESP: Coordinator
ASSOCIATION: EG&G Idaho, Inc.
EXPERIENCE: 14 Years
  • EG&G Idaho, Inc.
    - Senior Administrator: Support and assist DOE-HQ in staffing Technical Safety Appraisals, Tiger Team Management Subteams, and similar onsite review teams. Maintain rosters of consultants and laboratory personnel in all technical disciplines.
    - Report Coordinator for the Safety and Health Subteam on the Tiger Team Assessments at the Paducah Gaseous Diffusion Plant, the Solar Energy Research Institute, the Los Alamos National Laboratory, the Naval Petroleum Reserves in California, the Strategic Petroleum Reserves, and for the Chemical Safety Oversight Review at the Los Alamos National Laboratory.
    - Administrator: Assisted in the planning and handled the logistics for the onsite review teams for the Technical Safety Appraisals conducted at the Advanced Test Reactor. Acted as liaison between EG&G Idaho management and team members during onsite appraisal.
    - Senior Administrative Specialist: Performed full secretarial responsibilities in support of the Advanced Test Reactor.
  • Aero Jet Nuclear
    - Branch Secretary: Performed full secretarial responsibilities in support of the Advanced Test Reactor and the Environmental Test Reactor.
    - Technical Typist: Performed responsibilities in support of the Test Reactor Area.
EDUCATION: Numerous work-related workshops, computer courses, and general management and administrator skill courses.
OTHER: Certified Trainer, Crosby Quality Education System Member, American Nuclear Society Member, Beta Sigma Phi
NAME: Robert D. Jones
AREA OF RESP: Aviation Safety
ASSOCIATION: Office of Risk Analysis and Technology, Headquarters, Department of Energy
EXPERIENCE:
- 7 Years
  - U.S. Department of Energy, Germantown, MD
    - Aviation Safety Specialist, Office of Quality and Safety.
    - Representative, Interagency Committee on Aviation Policy.
  - United States Navy
    - Lieutenant, USN.
    - Winged Naval Aviator.
  - United States Air Force
    - Equipment Specialist, TF-30 Technical Services.
    - F-111 Depot Level Maintenance Team.
    - Areas of Expertise: Afterburner, Combustion Chamber, Fuel Control.
EDUCATION:
- M.B.A., Management Specialty, Oklahoma City University
- B.S., Engineering Technology, Oklahoma State University
- Additional courses: Federal Aviation Administration Academy, Transportation Safety Institute, Embry Riddle Aeronautical University, ES&G

NAME: Bernard R. Kokenge
AREA OF RESP: Organization and Administration/Quality Verification
ASSOCIATION: BRK Associates, Inc.
EXPERIENCE:
- 27 Years
  - Private Consultant
    - TSA/Tiger Team Member on 20 DOE Headquarters appraisals.
    - Member of the Secretary of Energy’s Tritium Task Group.
    - Chairman, Sandia National Laboratory, Livermore, Safety Oversight Committee.
    - Chairman, Safety and Health Assessment, Battelle Memorial Institute.
  - Vice President, Kentucky Christian College
    - Strategic Planning and Program Development.
  - Monsanto Research Corporation, Mound Plant
    - Associate Director Mound; Responsible for all Mound’s component development and production activities associated with primary detonators, timers, actuators, and pyrotechnic devices.
    - Nuclear Operations Director: Responsible for all radiological development and production technology as applied to the isotopes of hydrogen, analytical chemistry support for Mound, and production/testing of radioisotopic thermoelectric generators for the Galileo and Ulysses space missions.
    - Nuclear Technology Manager: Responsible for diverse technical radiological functions including plutonium-238 processing technology, plutonium waste management development, tritium process development in support of DOE weapons programs, and processing/engineering technology for Mound’s tritium operations.
    - Plutonium Processing Manager: Responsible for the Plutonium Processing Building operation, wherein plutonium-238 fuel forms were produced and plutonium-238 scrap recovered.
    - Plutonium Fuels Group Leader: Investigated the behavior and physical properties of plutonium-238 as a fuel for space applications.
EDUCATION:
- Ph.D., Inorganic Chemistry, Ohio University
- B.S., Chemistry, University of Dayton
OTHER:
- Patent on Plutonium-238 isotopic fuels
- DOE Management Team Chairman for the Galileo and Ulysses RTG space mission program
- Member, American Chemical Society
NAME: Donald E. Lentzen
AREA OF RESP: Medical Services
ASSOCIATION: Office of Occupational Medicine, Headquarters, Department of Energy
EXPERIENCE: 21 Years
- U.S. Department of Energy, Germantown, MD
  - Health Systems Specialist: Concerned with the general health and welfare of DOE contractors and employees through the auditing of worksite conditions, emergency preparedness and health care delivery systems.
- R.J. Lee Group, Raleigh, NC
  - Studied material science problems with the appropriate application of microscopy techniques. Assisted in drafting methods for microparticle identification of asbestos which was subsequently published in the Federal Register.
- Research Triangle Institute, Research Triangle Park, NC
  - Program Manager/Senior Research Scientist: Provided program planning and staff coordination for quality control/quality assurance activities related to industrial processes, pollution control, environmental assessment, and hazardous waste management.
- North Carolina Department of Natural and Economic Resources, Raleigh, NC
  - Established and administered State’s three-branch environmental testing laboratories. Assisted in development of a "STORES" database certification program.
- University of Texas Medical School, San Antonio, TX
  - Post-doctoral Research Scientist: Investigated molecular aspects of cell division in bacteria by monitoring membrane protein production in synchronized cell growth.
- U.S. Public Health Service, St. Petersburg, FL
  - Evaluated effectiveness and environmental impact of various pesticides for the National Communicable Disease Control Center.
- Department of Health, Education, and Welfare, Cleveland, OH
  - Set up and operated shipboard and field laboratories at strategic location for Lake Erie testing in the Great Lakes Illinois River Basin Project.
EDUCATION: Ph.D., Microbiology, University of Texas
M.S., Public Health, University of North Carolina
B.S., Biology, Alma College

NAME: Oliver D.T. Lynch, Jr.
AREA OF RESP: EH Senior Manager
ASSOCIATION: Office of Performance Assessment, Headquarters, Department of Energy
EXPERIENCE: 26 Years
- U.S. Department of Energy, Germantown, MD
  - Director, Safety Inspections Division, OSA.
- U.S. Nuclear Regulatory Commission, Rockville, MD
  - Radiation Measurements and Health Effects Section Chief.
  - Standardization and Decommissioning Section Chief.
  - Safeguards and Non-Power Reactors Section Chief.
  - Radiation Protection Section Leader.
  - Environmental Assessment Section Chief, TMI Program Office.
  - TMI Special Inquiry Group (Rogovin).
  - Senior Environmental Project Manager.
- International Atomic Energy Agency
  - Technical Working Group Leader, Vienna, Austria.
  - Instructor, Cairo, Egypt.
- General Dynamics, Electric Boat Division, Groton, CT
  - Chief, Radiological Control Health Engineering.
- U.S. Atomic Energy Commission, Las Vegas, NV
  - Radiological Specialist.
- San Diego State University, San Diego, CA
  - Assistant Radiological Safety Officer.
EDUCATION: M.S., Nuclear Physics, San Diego State University
B.S., Applied Physics, San Diego State University
OTHER: Member: Health Physics Society, American Forestry Association, Sigma Pi Sigma
Author, Textbooks and Training Manuals, Small Craft Safety, Operations, and Navigation
IIEEE:
Carl W. Mangus
AREA OF RESP: Maintenance
ASSOCIATION: Private Consultant
EXPERIENCE: 38 Years
- Private Consultant
  - Consultant to legal and operating firms in areas of gas plant,
    drilling and production safe work practices, confined space entry,
    personnel injuries, crane and wire rope failures, workboat safety,
    operations, and helicopter helipad facilities. Performed technical
    safety surveys of oil and gas producing/processing facilities.
- Shell Offshore, Inc.
  - Senior Staff Technical Safety Specialist. Responsible for
    performing technical safety review/approval of engineering and
    operating procedures.
  - Manager of Offshore Regulatory Affairs. Responsible for
    formulating government regulations/industry standards.
  - Superintendent Offshore Production and Maintenance; Offshore
    Engineering Section Leader.
  - Project Developer and Manager of several gas processing plants and
    associated pipelines.
- Independent Contractor
  - Performed duties on workover and drilling rigs, and pipeline
    projects.
EDUCATION: B.S., Mechanical Engineering, Oklahoma State University
OTHER: Registered Professional Engineer, Louisiana
Member: American Society of Safety Engineers, Society of
Petroleum Engineers, Gulf Coast Safety and Training Group,
American Petroleum Institute
Past participation in: International Association of
Drilling Contractors, Offshore Operators Committee, U.S.
Coast Guard committees; Past Chairman, API Offshore Crane
Specifications, API Offshore Crane Operating and Maintenance
Procedures Marquis Who’s Who in America, Science and
Engineering, and the Safety Profession; Listed in Dictionary
of International Biography

NAME: Paul M. Mossmann, M.D.
AREA OF RESP: Medical Services
ASSOCIATION: Private Consultant
EXPERIENCE: 40 Years
- Private Consultant
  - Consulting with government and private agencies offering expertise
    in the medical services field with respect to organization and
    administration, procedures and documentation, and medical
    treatment.
- Sandia National Laboratories
  - Medical Director, responsible for the overall management of the
    Medical Services Department.
  - Associate Medical Director of Sandia National Laboratories.
- Arabian American Oil Company (ARAMCO) Dhahran, Saudi Arabia
  - Occupational Health Physician.
- Northern California State
  - General Practitioner.
- U.S. Army
  - Captain in Medical Corps.
EDUCATION: M.D., George Washington University, Washington, D.C.
M.P.H., and Occupational Health, University of California,
Berkeley
OTHER: Certified by American Board of Family Practice
Certified by American Board of Preventive Medicine in
Occupational Medicine
Member, American Medical Association
Member, American Academy of Family Practice
Member, American Academy of Occupational Medicine
NAME: James B. Murphy
AREA OF RESP: Worker Safety/OSHA IB Specialist
ASSOCIATION: Murphy & Associates
EXPERIENCE: 3 Years
- Prudential Insurance Company
  - Computer data input for dental claims.
- Murphy & Associates
  - Assisted in industrial hygiene sampling.
  - Assisted in conducting safety inspections.
  - Knowledgeable in OSHA standards and researched appropriate OSHA standards violations.
  - Developed OSHA-modifies IB’s
  - Developed report formats.
  - Performed computer programming, data input, and Beta testing as part of DOE Technical Safety Appraisals.
EDUCATION: Core courses and computer programming, County College of Morris, Randolph, New Jersey

NAME: William R. Murphy
AREA OF RESP: Worker Safety and Health (OSHA) Compliance
ASSOCIATION: Murphy and Associates
EXPERIENCE: 23 Years
- Murphy & Associates
  - Safety and health audits for major corporations.
  - Training of Safety and Health inspectors.
  - Compliance guidance to Federal, state, and local governments.
  - Expert witness in the areas of construction, aviation, and worker safety and health.
  - Participated in 25 DOE Technical Safety Appraisals, and one OSH Probe.
- Exxon - Special Assignment
  - Corporate Safety Engineer (Special Assignment). Responsible to President for all matters pertaining to safety, health, and environment.
  - Senior Safety Engineer. Site safety responsibilities for all research/laboratory/pilot plant and construction projects.
  - Safety Engineer (ESSO, Venezuela). Monitored, inspected, and implemented project safety/health fire protection.
- Lurgi Corporation
  - Director of Safety for corporate and field operations safety programs.
EDUCATION: B.S., Aeronautical Safety, Emory-Riddle University
OTHER: Executive Secretary, National Safety Council
Member, Systems Safety Society
Member, American Society of Safety Engineers
NAME: F. Richard Myal
AREA OF RESP: Operations/Site-Facility Safety Review
ASSOCIATION: CER Corporation
EXPERIENCE: 25 Years
- CER Corporation, Las Vegas, NV
  - Technical and project management responsibilities with DOE sponsored Western Gas Sands Program research activities. Currently responsible for planning, engineering, management, and execution of the Slant Hole Completion Test experimental project. This project is designed to evaluate horizontal drilling as an alternative development method for tight, naturally fractured gas bearing sandstones and coals. Previously managed the Technology Extrapolation in Tight Western Gas Sands contract, and the last two years of the Multiwell Experiment contract. Both projects involved tight gas sands field research in the Piceance Basin in western Colorado. In addition, have recently completed a gas reserve and technical evaluation of an on-going gas development program in Jordan funded by the World Bank. Participated in the Technical Safety Appraisal (Tiger Team) conducted during March 1992 at the Strategic Petroleum Reserve sites in Louisiana and Texas, and was responsible for assessing contractor performance of maintenance at the Louisiana sites.
- Pluie Energy Company, Denver, CO
  - District Manager: responsible for all engineering, drilling, production activities, supervision of consultants, regulatory compliance, gas contract negotiation, and conflict resolution for company operated oil and gas wells in Colorado and Utah as well as non-operated wells in Oklahoma, Louisiana, Texas, Mississippi, and West Virginia.
- Amoco Production Company, Denver, CO and Calgary, Canada
  - Various Engineering assignments involving design, installation, troubleshooting of waterflood and steamflood operations and oil and natural gas development projects in Wyoming, Colorado, and Utah. Assignments in Canada included heavy oil (Cold Lake) and tar sands (Athabasca) pilot projects, and corporate economics.
EDUCATION: M.S., Petroleum Engineering, Pennsylvania State University
B.S., Petroleum Engineering, West Virginia University
OTHER: Registered Professional Engineer: Nevada, Colorado, Alberta

NAME: Robert L. Paullin
AREA OF RESP: Packaging and Transportation/Pipeline Safety
ASSOCIATION: Paullin Consulting Services
EXPERIENCE: 42 Years
- Paullin Consulting Services
  - Principal. Provides management and engineering and expert witness services on transportation and pipeline safety subjects to clients (research, position development, testimony, assistance). Clients include the Timken Company, Continental Telephone Company, the Institute for Professional Education, Applied Ordinance Technology, Inc., United Technologies, Marks Research, GLH, Inc., James Hubbard, Esquire, Jackson & Kelly, USDA Graduate School, George Washington University, BASF, DuPont, University of Texas at Brownsville.
  - U.S. Department of Transportation
    - Director, Office of Pipeline Safety.
    - Director, Office of Enforcement, Materials Transportation Bureau.
    - Director, Office of Research and Development.
- Douglas Aircraft Company
  - Chief Flight Safety Engineer.
- Federal Aviation Administration
  - Director, Systems Analysis Office.
EDUCATION: Ph.D, Public Administration, University of Southern California
M.S., Civil Engineering, University of California at Berkeley
B.S., Mechanical Engineering, South Dakota School of Mines & Technology
OTHER: Registered Professional Engineer, District of Columbia Commercial Pilot, single and multi-engine aircraft Member, Professional Societies
Glenn A. Whan

**AREA OF RESP:** Technical Support/Training and Certification

**ASSOCIATION:** Private Consultant

**EXPERIENCE:** 36 Years

- Private Consultant
  - Participated in 27 DOE Technical Safety Appraisals from 1986 to 1992 in one or more of the following technical areas: nuclear criticality safety, technical support, auxiliary systems, facility engineering, site/facility safety review, packaging and transportation, experimental activities, training and certification, and emergency preparedness.
  - Participated in Nuclear Safety Reviews, 1980 to 1992, as Member Sandia Tritium Research Laboratory Safety Oversight Committee; Member and Chairman (for one year), DOE Independent Review Committee For Transuranic Waste; Member, NRC Nuclear Criticality Safety Appraisal Teams; Member, DOE Readiness Review Teams and SAR Reviews.
- University of New Mexico
  - Professor of Chemical and Nuclear Engineering, 1957 to 1985, including 11 years as Department Chairman and 3 years as Associate Dean of Engineering; nuclear reactor licensing, and operation; Co-60 irradiation cell design, licensing, and operation; nuclear safety and nuclear environmental safety analysis; nuclear criticality safety education and training.

**EDUCATION:**
Ph.D. Chemical Engineering, Carnegie-Mellon University
M.S., Chemical Engineering, Montana State University
B.S., Chemical Engineering, Indiana Institute of Technology

**OTHER:**
Fellow of American Nuclear Society
Member, American Institute of Chemical Engineers
Professional Engineer, Nuclear Engineering, New Mexico

Bernard S. Zager, M.D.

**AREA OF RESP:** Medical Services

**ASSOCIATION:** Private Consultant

**EXPERIENCE:** 36 Years

- Consultant for Occupational Medical Programs.
  - Participated in numerous DOE Technical Safety Appraisals as a reviewer of Occupational Medical Programs.
- General Electric Company
  - Medical Director and Manager Health and Safety Operation, Nuclear Energy Business Operation.
- Ford Motor Company
  - Chief Physician, Automotive Assembly Division.
- Michigan Bell Telephone Company
  - Staff Physician.
- Private practice medicine and surgery
- U.S. Army
  - Medical Officer, Mobile Army Surgical Hospital (MASH), Korea.

**EDUCATION:**
M.D., Northwestern University
B.A., Wayne State University

**OTHER:**
Fellow, American College Occupational and Environmental Medicine
Fellow, American College Preventive Medicine
Certified in Occupational Medicine, American Board Preventive Medicine
BIOGRAPHICAL SKETCHES OF MANAGEMENT SUBTEAM MEMBERS

NAME: Marcus E. Jones

AREA OF RESP: Management Subteam Leader

ASSOCIATION: U.S. Department of Energy, Headquarters, Office of Special Projects

EXPERIENCE: 9 years

- U.S. Department of Energy
  - Office of Special Projects (OSP) Training Program Manager.
  - Led effort to develop pilot process for ESHH Progress Assessments (i.e., followup to the Tiger Team Assessments).
  - Coordinated or assisted in coordination of Tiger Team Assessments (TTAs) for Los Alamos National Laboratory; Sandia National Laboratories, Albuquerque; Hanford; and Argonne Illinois Site.
  - Served as Deputy Management Subteam Leader for the HA of the Oak Ridge K-25 Site.
  - Served as Assistant Environmental Subteam Leader for the TTA of the Sandia National Laboratories, Albuquerque.

- Environmental Strategies Corporation
  - Acted as Project Manager for a wide range of efforts including various remedial projects, such as an Interim Remedial Measures and Remedial Investigation/Feasibility Study for a National Priority List site, environmental management assessments, and development of compliance management programs for corporations.

- Geo/Resource Consultants, Inc.
  - Managed sampling and drilling operations at RCRA/Superfund Sites. Conducted various regulatory inspections and assessments.

EDUCATION: M.S.E., Environmental Engineering, University of Alabama
            B.S., Biology, University of Alabama
HAIlE:

Robert M. Compton

AREAS OF RESP: Management Assessment

ASSOCIATION: Nuclear Power Consultants, Inc.

EXPERIENCE: 23 years

• Private Consultant
  - Participated in the DOE Tiger Team Assessments (Management Subteam and special conduct of operations assessments) of the Savannah River Site, Hanford, Energy Technology Engineering Center, Morgantown Energy Technology Center, Naval Petroleum Reserves in California, and Idaho National Engineering Laboratory. Also, participated in the Progress Assessments of Fernald, Y-12 Plant, and Hanford.
  - Participated in appraisals of construction programs, Safety System Functional Inspections (SSFIs), Motor Operated Valve problems, regulator issues, etc. for nuclear utilities.
  - Numerous individual and team assessments and problem resolution assignments at nuclear utilities for the NRC related to Safety System Quality Inspections (SSQEs), Construction Appraisal Team (CAT) inspections, instrumentation, in-service testing of pumps and valves, compensatory measures, restart readiness reviews, "problem plant" corrective actions, safety allegations, etc.

• U.S. Nuclear Regulatory Commission
  - Senior Engineer and Reactor Inspector in the areas of civil and mechanical construction, testing and modification, inspection and enforcement.

• Mare Island Naval Shipyard (U.S. Department of Defense)
  - Nuclear Fluid Systems Engineer and Supervisory Nuclear Engineer for construction, repair, and refueling of Navy nuclear vessels.

EDUCATION: B.S., Civil Engineering, California State University at Chico

OTHER: Member, American Nuclear Society
Member, American Society for Quality Control
Member, American Society for Civil Engineers
Member, American Consulting Engineers Council

NAME: Ray D. Duncan

AREA OF RESP: Management Assessment

ASSOCIATION: Private Consultant

EXPERIENCE: 41 years

• Private Consultant
  - Chaired Task Group to examine management systems and project management controls at the Savannah River Field Office.
  - Conducted analysis of existing business management systems at the Nevada Field Office.
  - Chaired Task Force of nationally recognized experts to examine SAIC's quality assurance program in support of the High-Level Waste Storage Program at the Nevada Test Site.
  - Chaired a Task Force to develop and document a detailed operational plan for hosting U.S.S.R. scientists at the Nevada Test Site.

• U.S. Department of Energy, Energy Research and Development Administration, Atomic Energy Commission
  - Deputy Manager, Nevada Operations Office, responsible for directing high technology research and development programs with annual budget in excess of $650 million and an organization of more than 9,000 employees.
  - Director of EDP and Administrative Services Division, Nevada Operations Office, responsible for all scientific and computer systems and direction of internal administrative functions.

EDUCATION: Masters level course work at Graduate School of Public Administration, University of Washington

OTHER: Distinguished Career Service Award
Meritorious Executive Award
NAME: Mark A. Hartman

AREA OF RESP: Management Assessment

ASSOCIATION: U.S. Department of Energy, Headquarters, Office of Special Projects

EXPERIENCE:
- 2 years
  - U.S. Department of Energy, Office of Environment, Safety and Health (EH)
    - Participant in the DOE Management Intern Development Program (MIDP).
    - Participant in the Tiger Team Assessment of the Strategic Petroleum Reserves as a member of the Management Subteam.
    - Coordinator for the Cost Plus Award Fee (CPAF) review process for EH. Perform trend analysis of, and maintain data base for, CPAF information.
  - Pennsylvania State Treasury Department, Office of Procurement
    - Conducted research projects on procurement issues and fire protection systems.

EDUCATION:
- M.P.A., Public Administration, Syracuse University
- B.A., Political Science and Criminal Justice, Mansfield University

NAME: Robert F. McCallum

AREA OF RESP: Management Assessment

ASSOCIATION: Private Consultant

EXPERIENCE:
- Private Consultant
  - Provides environmental, management, and planning consulting services in energy technology and waste management. Participant in the Tiger Team Assessments of the Los Alamos National Laboratory and Ames Laboratory as a member of the Management Subteam and served as the Report Technical Manager for the Tiger Team Assessments of the Naval Petroleum Reserves in California and the National Institute for Petroleum and Energy Research.
  - Packer Engineering, Inc.
    - Responsible for coordinating development of technical and cost proposals to government and industrial clients addressing a broad range of engineering and scientific disciplines. Served on the Energy Technology Engineering Center, Morgantown Energy Technology Center, and Solar Energy Research Institute Tiger Team Assessments as the Report Technical Manager. Served on the Management Subteam of the Pittsburg Energy Technology Center Tiger Team.
  - Battelle Memorial Institute
    - Responsible for conducting site selection, institutional support, and regulatory compliance support to DOE as part of basic technology support associated with DOE's geologic repository and interim waste storage programs.
    - Coordinated preparation of environmental data reports and decision methodology document in support of DOE's Crystalline Repository Program for disposal of high-level nuclear waste. Participated in numerous public and state briefings during program.
    - Assisted in development of site selection methodology for identification of potential host locations for disposal of low-level radioactive waste in Illinois.

EDUCATION:
- M.S., Management, Purdue University
- B.S., Civil Engineering, University of Lowell

OTHER: Received Engineer-In-Training Certificate, Massachusetts
NAME: Leon H. Meyer  AREA OF RESP: Management Assessment  ASSOCIATION: The LHM Corporation  EXPERIENCE: 39 years
- President, The LHM Corporation
  - Technical expert under contract to Oak Ridge Associated Universities and EG&G Idaho, Inc.
  - Served on 40 Technical Safety Appraisals for DOE’s Office of Environment, Safety and Health.
- Savannah River Plant, E.I. DuPont de Nemours & Company, Aiken, S.C.
  - Program Manager responsible for safeguards and security, long-range planning, budget coordination, quality assurance, environmental control, energy conservation, and away-from-reactor spent fuel storage.
- Atomic Energy Division, E.I. DuPont de Nemours & Company,
  - Program Manager, Technical Division with responsibilities for the Defense Waste Processing Facility and the LWR Fuel Reprocessing Design Project.
- Savannah River Laboratory, E.I. DuPont de Nemours & Company, Aiken, SC
  - Assistant Director.
  - Director, Separations Chemistry and Engineering Section.
  - Research Manager, Separations Chemistry Division.
  - Research Supervisor, Separations Engineering Division with responsibilities in the areas of chemical separations; plutonium, uranium, and thorium processing; and tritium technology.
EDUCATION: Ph.D., Physical Chemistry, University of Illinois  M.S., Chemistry, Georgia Institute of Technology  B.S., Chemical Engineering, Georgia Institute of Technology

- U.S. Department of Energy, Office of Environment, Safety and Health (EH), Washington, DC
  - Physical Scientist/Team Leader, responsible for conducting self-assessment evaluations as part of Tiger Team Assessments and Progress Assessments.
  - Project Manager, responsible for development of a Central Facility Profile Data Base for Tiger Team Assessment, Action Plan, Progress Assessment, and Self-Assessment information.
- Battelle Memorial Institute, Washington, DC
  - Program Manager, responsible for management of large mission-oriented contract for environmental assessments with the Office of Wetland, Oceans, and Watersheds, U.S. Environmental Protection Agency.
  - Office Manager, responsible for management of Washington, DC office of Battelle Ocean Sciences and environmental contract services to Federal agencies.
- Environmental Science and Engineering, Inc., Herndon, VA
  - Chief Scientist/Deputy Office Manager, responsible for management of environmental compliance auditing and environmental assessment program services.
  - Department Manager, responsible for risk assessment and risk management services to Federal, state, and local governments and industrial clients.
- U.S. Environmental Protection Agency, Office of Solid Waste and Emergency Response, Washington, DC
  - Section Chief, responsible for performing and managing risk assessments and environmental compliance assessments of CERCLA and RCRA sites.
  - Environmental Scientist, responsible for technical case advisement for hazardous waste, toxic substances, and pesticide enforcement cases.
EDUCATION: M.S., Animal and Veterinary Sciences, University of Maryland  B.S., Microbiology, Colorado State University
NAME: Millicent L. Stokes

AREA OF RESP: Technical Editor/Information Management Specialist

ASSOCIATION: Advanced Sciences, Inc.

EXPERIENCE: 7 years

- Advanced Sciences, Inc.
  - Technical Editor/Information Management Specialist. Provides onsite administrative oversight, technical editing, and graphics support to the Environmental and Management Subteams during Tiger Team Assessments. Assessments include the Fermi National Accelerator Laboratory, Strategic Petroleum Reserves, Naval Petroleum Reserves in California, Los Alamos National Laboratory, Solar Energy Research Institute (now NREL), Morgantown Energy Technology Center, Lawrence Berkeley Laboratory, Oak Ridge National Laboratory, Hanford, Paducah Gaseous Diffusion Plant, and Sandia National Laboratories, Livermore. Edits the draft assessment reports, oversees the preparation of the final assessment reports, and provides writing, editing, and graphics support to the U.S. Department of Energy’s (DOE’s) Office of Special Projects. Also participated in the Environmental Audit of the Southwestern Power Administration for DOE’s Office of Environmental Audit.

- Writer/Editor. Researched, wrote, and edited fact sheets and information briefs on energy conservation and renewable energy topics, including window innovations, energy efficient lighting, and heat pumps, for a DOE-funded energy information service. Also, managed the service’s information brief system, supervised media outreach for the project, and researched selected inquiries received from special interest groups.

- Response Analyst/Media Liaison. Analyzed and researched inquiries on energy from the general public, U.S. Congress, and trade associations. Also, wrote information briefs and assisted with media outreach.

- The Rocky Mount Record (Rocky Mount, North Carolina)
  - News Editor/Reporter. Edited news copy, wrote news and feature articles, and took photographs.

EDUCATION: B.A., Journalism/Communicative Arts; minor in Public Relations, Pembroke State University

OTHER: Member, Society of Technical Communication

Appendix B

ENVIRONMENTAL SUBTEAM ASSESSMENT PLAN
1.0 INTRODUCTION

On June 27, 1989, Secretary of Energy, James D. Watkins announced a 10-point initiative to strengthen environmental protection and waste management activities in the U.S. Department of Energy (DOE). One of the initiatives involves conducting Tiger Team Assessments at DOE's operating facilities.

The purpose of the environmental portion of the Tiger Team Assessment at the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW) is to provide the Secretary with information on the current environmental regulatory compliance status and associated vulnerabilities of the facilities, root causes for noncompliance, adequacy of DOE and site contractor environmental management programs, and response actions to address the identified problem areas.

The scope of the environmental assessment for NPOSR-CUW is comprehensive, covering Federal, state, and local regulations, requirements and guidelines, and best management practices (BMP). The environmental disciplines to be addressed in this assessment include: air; soils, sediments, and biota; surface water; groundwater; waste management; toxic and chemical materials; quality assurance; radiation; and inactive waste sites. The assessment will also address National Environmental Policy Act (NEPA) requirements.

2.0 ENVIRONMENTAL ASSESSMENT IMPLEMENTATION

The environmental assessment of the Naval Petroleum and Oil Shale Reserves in Colorado, Utah, and Wyoming (NPOSR-CUW) will be conducted by a team managed by the Environmental Subteam Leader and two Deputy Subteam Leaders from the DOE Office of Environmental Audit, a NEPA Coordinator from the DOE Office of NEPA Oversight, a Group Coordinator and technical specialists from Arthur D. Little, Inc., and one NEPA specialist from Oak Ridge National Laboratory (ORNL). The names and responsibilities of the team members are listed below:

<table>
<thead>
<tr>
<th>Name</th>
<th>DOE/NPOSR-CUW</th>
</tr>
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<tbody>
<tr>
<td>AI Stikl</td>
<td>DOE Subteam Leader</td>
</tr>
<tr>
<td>Bill Hasselkus</td>
<td>DOE Deputy Subteam Leader</td>
</tr>
<tr>
<td>Lee Banicki</td>
<td>DOE Deputy Subteam Leader</td>
</tr>
<tr>
<td>Raean Reid</td>
<td>Arthur D. Little Group Coordinator</td>
</tr>
<tr>
<td>Sarah Simon</td>
<td>Arthur D. Little Air</td>
</tr>
<tr>
<td>James Rea</td>
<td>Arthur D. Little Groundwater/Soils, Sediments, and Biota</td>
</tr>
<tr>
<td>Cliff Summers</td>
<td>Arthur D. Little Surface Water/Drinking Water</td>
</tr>
<tr>
<td>Don Neal</td>
<td>Arthur D. Little Waste Management</td>
</tr>
<tr>
<td>Rich D'Eraillo</td>
<td>Arthur D. Little Toxic and Chemical Materials</td>
</tr>
<tr>
<td>Joe Swinarski</td>
<td>Arthur D. Little Quality Assurance</td>
</tr>
<tr>
<td>Bill Rhodes</td>
<td>Arthur D. Little Radiation</td>
</tr>
<tr>
<td>Joe Delaney</td>
<td>Arthur D. Little Inactive Waste Sites</td>
</tr>
<tr>
<td>John Pulliam</td>
<td>DOE NEPA Coordinator</td>
</tr>
<tr>
<td>Lorene Sigal</td>
<td>ORNL NEPA</td>
</tr>
</tbody>
</table>

2.1 PREASSESSMENT ACTIVITIES

Preassessment activities for the NPOSR-CUW assessment include the issuance of an introduction and information request memorandum, a preassessment site visit, and initial review of documentation which was sent to the Environmental Subteam by NPOSR-CUW as a result of the information request memorandum, and requests during the preassessment site visit. In addition, prior to initiation of onsite work, each of the technical specialists may contact regulators, whose names were provided by NPOSR-CUW personnel, to request the most current regulations for the environmental disciplines being covered by the assessment or to clarify regulations.

The preassessment site visit was conducted April 28-30, 1992, and was attended by the Environmental Subteam Leader, the Deputy Subteam Leaders, and the Group Coordinator. The purpose of the preassessment visit was to become familiar with the operation of Naval Petroleum Reserve No. 3 (NPR-3), Naval Oil Shale Reserves Nos. 1, 2, and 3 (NOSR-1, NOSR-2, and NOSR-3) and NPOSR-CUW as a unit; to review information being supplied to the subteam; and to coordinate plans for the upcoming assessment with DOE and John Brown E & C Inc. (JBEC) personnel. Representatives from state and local governments were invited to present their concerns with respect to environment, safety, and health. Three representatives of regulatory agencies attended the preassessment meeting and participated in discussions with the subteam.

2.2 ONSITE ACTIVITIES AND REPORTS

The onsite activities for the environmental assessment will take place from June 15 to July 20, 1992. These activities will include field inspections, file/record reviews, and interviews with Casper- and Rifle-based NPOSR-CUW personnel and regulatory personnel. Each of the specialists will evaluate the status of corrective actions taken in response to the various types of environmental audits/assessments that have been conducted at NPOSR-CUW during the 1988 Environmental Survey, the management effectiveness audits, the self-assessments, audits by environmental consultants, and regulatory inspections. The overall schedule and detailed agenda for the Environmental Subteam technical specialists is shown in Appendix C. Any modifications to the agenda while in the field will be coordinated with the NPOSR-CUW environmental site contacts.

The Environmental Subteam has been divided into two teams. Table B-1 lists the members of the two teams. Team A will conduct field work in Wyoming only and Team B will conduct field work in both Wyoming and Colorado. The disciplines which will receive the most intense review at NOSR-1 and NOSR-3 are groundwater, surface water, and inactive waste sites; however, the other disciplines will be reviewed on a more limited basis by these specialists during their field work in Colorado. Because there has been no development of the resources at NOSR-2, there will be no field work in Utah during the assessment. The inactive waste sites specialist will review aerial photos of NOSR-2, however, for the purpose of identifying evidence of dumping.
A daily debriefing for the benefit of the Environmental Subteam Leader will be held each afternoon. At a specific time, determined by the Environmental Subteam, the technical specialists will relate a summary of their activities of the day and any concerns which may develop into findings. DOE and JYEC personnel and regulators may attend these debriefings and will be encouraged to provide the subteam members with additional information and clarification as needed.

Written draft findings for each discipline will be provided to DOE/NPOSR-CUW personnel, DOE Headquarters personnel, and JYEC personnel prior to the factual accuracy review (FAR) for a particular discipline. These should be reviewed prior to the FAR, and there will be an opportunity during the FAR to comment on the technical and factual accuracy of the draft findings.

A closeout briefing will be conducted at the conclusion of the onsite assessment activities. A draft report containing findings from the entire Tiger Team assessment will be provided to the DOE/NPOSR-CUW and JYEC personnel for their review and comment.

3.0 AIR

The air portion of the assessment will evaluate the current operating practices and air quality programs at NPOSR-CUW to determine environmental compliance status. The documents and standards used will include regulations promulgated under the Federal Clean Air Act, those promulgated under the laws administered by the Wyoming Department of Environmental Quality and the Colorado Department of Health, and agency guidance and recommended procedures. The assessment will also review site conformance with DOE Orders, the Tiger Team Guidance Manual, general guidance and Secretary of Energy Notices as well as best management practices and site contractor policies and procedures.

The assessment will focus on air quality permitting needs and programs, emission characterization programs and inventories, operation of emission sources and control measures, asbestos management, and monitoring programs.

3.1 ISSUE IDENTIFICATION

The activities at NPOSR-CUW have the potential to create air pollution and are regulated by various Federal and state programs. Because there has been no development of the resources at NOSR-2, this site will not be within the scope of the air assessment. There will be a review in Casper of NOSR-1 and NOSR-3 documents related to air quality compliance and decontamination and demolition activities, including asbestos abatement, and there will be a limited assessment of air issues by one of the technical specialists on Team B during his field work at NOSR-1 and NOSR-3. The primary focus of the air assessment will be the activities at NPR-3 in Wyoming.

The approach to determining significant air quality issues at NPR-3 will be to inspect site facilities and air emission sources and observe operational and management activities that support air quality goals; to review the applicability of regulations and other standards; to evaluate the adequacy of emission source and monitoring documentation, records, and plans; to interview DOE, JYEC, and agency personnel; and to review other documents and files pertaining to air issues.
Based on NPOSR-CUN records and interviews, the assessment will determine whether the site has been adequately characterized for air quality purposes. Site information will be reviewed regarding the site emission sources (equipment, dust creating activities, organic materials storage, vehicle management, etc.) and its emission inventory. The review will also include any records, plans, or studies characterizing and addressing any short term or continuing risks posed by unplanned and planned emissions, and the program and plan for management of releases of hydrogen sulfide.

The documents related to state air permits and the Federal Prevention of Significant Deterioration (PSD) program will be reviewed. The assessment will review NPOSR-CUN procedures for assuring that appropriate permits are applied for and in place. Source operating procedures and activities will be examined for compliance with operating conditions of the permits and requirements of the state air regulations. Site programs will be evaluated with regard to the DOE air effluent monitoring requirements and the source testing requirements of state permits and regulations.

Ambient air quality and meteorological monitoring systems and reports will be investigated to determine whether they meet DOE and regulatory requirements and if they conform to good practice for acquiring, interpreting, and using air quality and weather information.

The assessment will also evaluate the site's conformance with asbestos emission control and notification requirements.

3.2 RECORDS REQUIRED

Documents and files that will be reviewed include, but are not limited to:

- Annual Environmental Reports for DOE;
- Contractor Environmental Control Questionnaire and checklists;
- Air Quality and Meteorological Monitoring reports and plans;
- Monitoring equipment and calibration records;
- NPOSR-CUN QA Program Manuals and records;
- Emission inventory reports for the Wyoming DEQ;
- Steam generator operating procedures;
- Well and tank battery operating and maintenance records;
- Gas and gasoline storage tank descriptions and records;
- Gas and gasoline handling equipment descriptions and records;
- Air permit applications for the Low Temperature Separation Gas Plant and Steam Generators;
- Other regulatory agency correspondence, notices and documents;
- Asbestos handling procedures and notifications; and
- Gas release control studies, including emergencies.

4.0 SURFACE WATER/DRINKING WATER

The surface water/drinking water portion of the assessment will evaluate compliance with Federal, state, and local water pollution control requirements established to comply with the Federal Clean Water Act and Safe Drinking Water Act. Included in the review will be the rules and regulations of the Colorado Department of Health, the Colorado Oil and Gas Conservation Commission, the Wyoming Department of Environmental Quality, and the Wyoming Oil and Gas Conservation Commission. In addition, the assessment will evaluate compliance with DOE Orders and Secretary of Energy Notices (SEN), and water pollution control operations with respect to accepted industry best management practices.

The scope of the surface water/drinking water assessment will include document reviews, interviews with DOE and JBEC personnel, inspection of facilities in both Colorado and Wyoming, including tank farms and tank batteries, observation of wastewater and groundwater sampling, and inspection of the potential direction for site storm water runoff. The Spill Prevention Control and Countermeasure (SPCC) plan implementation, including secondary containment, implementing procedures, and personnel training will be reviewed. As part of the surface water/drinking water portion of the assessment, interviews will be coordinated with other Environmental Subteam specialists, particularly the toxic and chemical materials and groundwater specialists, to ensure that all potential issues are addressed.

4.1 ISSUE IDENTIFICATION

NPOSR-CUN purchases its drinking water for NPR-3 in bulk from Midwest, Wyoming, treats the water by processing it through a reverse osmosis unit, and adds chlorine for purification. The treatment and distribution system will be inspected, documentation reviewed, and the potential need to certify the treatment operator will be assessed.

There are 15 NPDES permits for NPR-3. The permits, permit applications, the required sampling and analysis, and requisite data reporting will be reviewed to determine if they are in compliance with regulatory requirements.

A number of potential issues, noted during document review and discussions with site personnel, which will be addressed during the assessment include:

- Management of produced water, including monitoring, recordkeeping, and reporting requirements;
- The apparent concern regarding the potential impact of the possible NOSR-3 shale pile collapse on water quality in the adjacent West Sharrard Creek;
- An assessment of the need to apply for an NPDES stormwater permit for the shale pile runoff at NOSR-3;
• All sampling and analysis performed, and supporting documentation generated, to ensure NPDES compliance;
• An assessment of the need to characterize storm water runoff at NPR-3;
• An assessment of the need to prepare and implement a program to install, monitor, and maintain backflow prevention devices where required;
• Preparation of an Environmental Monitoring Plan that meets the requirements of DOE 5400.1;
• Preparation of a Water Monitoring Program that meets the requirements of DOE 5400.1; and
• SPCC Plan implementation.

4.2 RECORDS REQUIRED

Files will be reviewed as part of the assessment, including documents not yet reviewed or received. Specific documents and files to be examined as part of the review process include, but are not limited to, the following:

• Recent analytical data on wastewater releases;
• Notices of violations related to wastewater releases;
• Operators' logbooks and treatment plant records;
• Standard operating procedures for wastewater collection, holding, and treatment;
• Sampling protocols and logbooks;
• Wastewater lab tracking reports;
• Treatment plant and monitoring equipment maintenance records;
• Detailed drawings of the potable water storage and distribution system;
• Records of drinking water quality;
• Internal memos or correspondence related to surface water or drinking water issues;
• Surface water environmental surveillance programs;
• U.S. Department of Energy Award Fee Board final fee determination packages; and
• Other records as determined onsite.

5.0 GROUNDWATER/SOILS, SEDIMENTS, AND BIOTA

The purpose of the groundwater/soils, sediments, and biota portion of the environmental assessment for the NPOSR-CUW Tiger Team is to evaluate the programmatic and technical status of groundwater protection and monitoring as they are related to regulations, DOE Orders, and industry and best management practices (BMPs). This effort will be coordinated with the radiation, waste management, inactive waste sites, and surface water specialists. Standards used may include DOE Orders, Colorado Department of Health and Wyoming Department of Environmental Quality regulations, the Comprehensive Environmental Response, Compensation, Liability and Recovery Act (CERCLA) and the Resource Conservation and Recovery Act (RCRA). Guidance documents may include publications developed as part of the CERCLA and RCRA programs by the U.S. EPA, and documents published by professional groundwater organizations such as the National Water Well Association and the Association of Groundwater Scientists and Engineers.

The biota portion of the assessment will focus on the impact of NPOSR-CUW activities on flora and fauna in the area. A review of documents will include natural resource damage reports and Federal and state endangered species lists. A review of sampling and monitoring activities will be conducted during the onsite portion of the assessment.

5.1 ISSUE IDENTIFICATION

Preliminary review of information supplied by NPOSR-CUW has identified several issues concerning groundwater protection and monitoring programs. These issues include program management and implementation, technical execution of data collection activities, and data management and interpretation. These issues will be investigated through review of reports, written records, and documents, direct observations of field operations, and interviews with key technical and management personnel. Regulatory agencies will also be contacted if needed.

Groundwater protection plans, environmental monitoring program plans, and recent copies of environmental monitoring reports will be reviewed to determine if they are in compliance with DOE requirements. The reports will also be reviewed for technical accuracy and data validity. Preliminary review indicates that there may not be a comprehensive hydrogeological characterization of the NPOSR-CUW Sites. The presence of the known or suspected areas of contamination, such as the Anvil Points and Bullion Plants and shale piles, the herbicide drum disposal area, the solid waste disposal area, the chemical dock area, identified oil seeps, and at least six inactive mud pits (reserve pits), may indicate the need for additional groundwater monitoring locations.

The status of current investigations and plans for future corrective actions will be evaluated. In addition to document review, the groundwater specialist will observe field conditions, monitoring well locations and construction, well purging and sampling techniques and field QA/QC procedures. Discussions will be held with site personnel who have responsibilities for groundwater protection, remedial action, and monitoring well sampling.

The present soils, sediments, and biota monitoring programs at NPOSR-CUW appear to be minimal. The impact of historical and/or current liquid
discharges, surface water runoff from inactive waste sites, holding ponds and reserve pits will be examined in detail. Monitoring plans will be reviewed to determine if they are in compliance with regulations. Sample parameters, locations and collection techniques will be reviewed. Documents will be reviewed to determine the nature and extent of contamination at known or suspected source areas.

Key issues relative to groundwater, soils, sediments, and biota monitoring programs were identified from preliminary review of information provided by DOE. Specific issues to be investigated further include, but are not limited to:

- The interaction and implementation of state and Federal groundwater and soil monitoring requirements and the relationship with offsite areas;
- The appropriateness and technical execution of the groundwater, soils, sediments, and biota sampling program;
- Sample QA/QC and chain-of-custody;
- Closure of monitoring wells, and well construction;
- Description of training of personnel that conduct groundwater, soils, sediments, and biota sampling and sample analysis;
- The appropriateness and enforcement of laboratory analytical procedures;
- Characterization of the groundwater regime;
- Characterization of the surface and subsurface soil regime;
- The level of data validation and personnel qualifications employed in the data validation; and
- Data management.

These issues will be investigated through review of reports, written records, and documents, direct observation of field operations, and interviews with key technical and management personnel.

5.2 RECORDS REQUIRED

The following documents will be needed to evaluate the status of the groundwater programs:

- Groundwater Protection Management Program Plan, Environmental Monitoring Plans (past and present) and Annual Site Environmental Reports, all of which are required under DOE 5400.1;
- NPOS-R-CUW Site specific reports of groundwater investigations, monitoring programs or remedial actions;
- A Health and Safety Plan, including special precautions required when constructing or sampling groundwater monitoring wells;
- Data and maps which contain information on subsurface geology, hydrology, and potential or known areas of contamination;
- Field operations plans and work plans for conducting past or present groundwater investigations and;
- Analytical sampling data.

The following documents will be needed to evaluate the status of the soils, sediments, and biota programs:

- Environmental monitoring reports;
- Field operations plans (with supporting SOPs), for conducting soils/sediment investigations;
- Environmental monitoring plans;
- Remedial action plans and reports;
- Site specific reports of surface or subsurface soils;
- Natural resource damage reports;
- Surveys of flora and fauna;
- Analysis of heavy metals and radionuclides in the biota; and
- Site specific reports of surface or subsurface soils.

6.0 WASTE MANAGEMENT

The purpose of the waste management portion of the environmental assessment is to examine compliance of the NPOS-R-CUW with state and Federal laws and regulations, DOE Orders, and Secretary of Energy Notices pertaining to the generation and management of hazardous and nonhazardous wastes. Included in the environmental assessment will be evaluations of waste accumulation, characterization, labeling, transportation, storage, recycling, and disposal practices.

This portion of the assessment will be coordinated with the inactive waste sites, surface water, and groundwater/soils, sediments, and biota specialists to identify any waste management practices that may pose a threat to the environment. This will also be coordinated with the quality assurance, toxic and chemical materials, and air specialists for issues related to training, waste sampling and analysis, PCB and pesticide waste management, and asbestos disposal.
6.1 ISSUE IDENTIFICATION

NPOSR-CUW consists of four distinct sites: two in Colorado and one each in Wyoming and Utah. The Naval Oil Shale Reserve No. 2 (NOSR-2), located in Utah, is not actively exploited, and therefore will not be included in the scope of the waste management assessment. The two sites in Colorado, NOSR-1 and NOSR-3, host DOE work related to environmental restoration, and drilling and operating offset wells. These sites will not be inspected by the waste management specialist during the environmental assessment. Rather, another member of the environmental subteam will inspect these sites. Most operations of the NPOSR-CUW occur at Naval Petroleum Reserve No. 3 (NPR-3) in Wyoming. This site is engaged in oil and gas production using a variety of primary, secondary, and tertiary techniques.

NPR-3 generates wastes associated with the production of oil and gas. This waste is exempt from the Federal hazardous waste regulations. Such materials include drilling mud, cuttings and well cement, produced waters, and sediments and sludges from produced water pits. Most of the oil and gas production wastes are regulated under the Federal nonhazardous waste regulations and by state regulations. Both NPR-3 and NOSR-1 and NOSR-3 are currently operating as a Conditionally Exempt Small Quantity Generator of hazardous waste (<100 Kg/month). At NPR-3, this waste is collected from generators and stored at the Hazardous Waste Storage Pad. Hazardous wastes generated at the sites include spent solvents, ignitable wastes, and characteristic wastes.

Nonhazardous waste generated at NPOSR-CUW includes oil and gas production wastes, petroleum contaminated soils, waste oils, construction debris, scrap metal, septage, and general refuse. Most of the oil and gas production wastes at NPR-3 are either injected underground (production waters), land applied (evaporation pond sludge and sediment), buried in place in retaining pits (drilling mud, cuttings and well cement), or buried in an onsite landfill.

Naturally occurring radioactive material (NORM) is generated at NPOSR-CUW, some of which eventually becomes waste. It appears that no mixed waste is stored or generated at NPOSR-CUW.

Management and control of wastes will be assessed through interviews with site personnel, inspections of waste generation points and waste management facilities, site records, and other relevant documents. The primary purpose of this evaluation will be to assess compliance with laws and regulations. However, in the case of unregulated waste management procedures and practices, the concept of Best Management Practice (BMP) will be applied to prevent or minimize releases of materials to the environment and to suggest more efficient operational procedures.

Based on an initial review of the NPOSR-CUW documents, there are several waste management facilities and programs that warrant evaluation including, but not limited to:

- Hazardous Waste Storage Pad;
- Solid Waste Disposal Facility (landfill);
- Road waste disposal operations;
- Bad Oil Recycling Facility;
- Retaining pits;
- Oil and gas waste management;
- Underground storage tank management;
- Waste generator training and procedures;
- Waste characterization and tracking;
- Satellite accumulation areas;
- Waste minimization; and
- Hazardous and radioactive waste management planning.

Underground injection wells used to dispose of production waters will be assessed by the groundwater specialist.

The Hazardous Waste Storage Pad is used to store hazardous waste prior to ultimate transport offsite for treatment and disposal. The environmental assessment will inspect the design, operation, maintenance and management of this facility. Compliance with Federal and state regulations will be evaluated. The road application operation and the onsite landfill will be inspected and records will be reviewed to ascertain regulatory compliance. Operation of the Bad Oil Recycling Facility will be evaluated as will management of retaining pits associated with well construction and production processing.

Waste generation points will be investigated and in place management systems will be assessed. Persons responsible for waste generation and operation of satellite accumulation areas for hazardous waste will be interviewed to ascertain basic waste generator knowledge. Training programs and records will also be examined to verify comprehensive participation by employees.

The overall system for managing waste at NPOSR-CUW will be evaluated, including waste characterization and tracking, waste minimization plan, and waste management program plan. In particular, management of oil and gas production waste, other nonhazardous waste, and hazardous waste will be examined. Each of these programs will be assessed for completeness and consistency with Federal and state laws and DOE Orders. Waste minimization programs were developed for NPR-3, NOSR-1, and NOSR-3. The implementation of these plans will be assessed.

The status of onsite records will be evaluated to determine whether appropriate documents are maintained as required by the regulations. These records include, but are not limited to: manifests, waste analysis records, operating logs, and inspection records. In addition, the status of any NPOSR-CUW procedures as they relate to environmental waste management will be evaluated. As part of waste management, and in conjunction with toxic and chemical materials specialist, the status of the site's underground storage tanks will be evaluated for compliance with regulations. Activities related to RCRA corrective actions will be examined in conjunction with the inactive
waste site specialist. Both the toxic and chemical materials and inactive waste sites specialists will be consulted on the issue of the "pig" pite located on the site. The waste management specialist will also coordinate with the radiation specialist to assess radioactive waste management at NPOSR-CUW.

5.2 RECORDS REQUIRED

In addition to documents reviewed prior to the initiation of onsite activities, we will be reviewing the following:

- Training records and curriculum;
- Last three years of manifests including landfill restriction notification forms;
- Permits and agency correspondence;
- Inspection reports and waste tracking reports; and
- Waste characterization.

7.0 TOXIC AND CHEMICAL MATERIALS

The toxic and chemical materials (TCM) portion of the assessment will address the management and control of hazardous materials used at NPOSR-CUW, such as bulk or laboratory quantity chemicals, compressed gases, polychlorinated biphenyls (PCBs), asbestos containing materials, pesticides, and other toxic and chemical materials, with emphasis on their handling and storage. The information obtained will be used to assess whether the management and control of these materials at NPOSR-CUW are in compliance with Federal, state, and local regulations, and with DOE Orders. In addition, the best management practice (BMP) concept will be applied to address the prevention and minimization of environmental releases of toxic substances for situations not specifically covered by regulations or DOE Orders. Primary emphasis will be given to the substances regulated by the Toxic Substance Control Act (TSCA), the Occupational Safety and Health Act (OSHA), and the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA).

The toxic and chemical materials assessment will be coordinated with the waste management, air, surface water, inactive waste sites, and quality assurance technical specialists. This site will not be within the scope of the TCM portion of the assessment. There will be a review in Casper of NOSR-1 and NOSR-3 documents related to chemical management, PCB management, and pesticide application, and there will be a limited assessment of TCM issues by one of the technical specialists on Team 8 during the field work at NOSR-1 and NOSR-3. The primary focus of the TCM assessment will be the activities at NPSR-3 in Wyoming.

Many toxic and chemical materials are currently stored and used at the NPOSR-CUW facilities. Most of these are treatment chemicals for water, wastewater, or downhole; chemicals for maintenance; or laboratory chemicals. Locations used in the past or currently for storage of toxic or chemical materials will be inspected. Areas of emphasis include the management of oils, paints, solvents, acids, bases, acutely hazardous materials, and compressed gases, as well as the spill prevention control and countermeasures developed at each site for management of these chemicals. The use of aboveground storage tanks (AST) for bulk chemical storage will be evaluated to determine if inspections, maintenance, and secondary containment is adequate.

The management of oil-filled electrical equipment and hydraulic equipment, which contains or has contained PCB and/or PCB-contaminated fluids will be reviewed during the assessment. PCB fluid and equipment disposal practices will be reviewed from past inventories to determine the methods of disposal and the locations of disposal sites. Procedures for PCB analysis, removal, and handling will be reviewed. Inspection and reporting requirements for PCB equipment and any past spills will be evaluated to identify potential problem areas.

Asbestos management, the past records or proposed plans to remove, store, and dispose of the material from contaminated buildings, soil, water, and equipment will be evaluated during this portion of the assessment. Based on preassessment review, it appears that asbestos at NPOSR-CUW can be found on buildings, pipelines, and in the form of transite siding. Evaluation of procedures, recordkeeping, storage, monitoring and inventories for asbestos will be conducted at NPOSR-CUW to ascertain the extent of asbestos management programs. Use of certified subcontractors for asbestos removal will also be evaluated. Asbestos management related to compliance with the national emission standard for asbestos will be evaluated by the Environmental Subteam air specialist.

Pesticide usage on the site will be reviewed to determine the risks of environmental contamination. Pesticides are applied at NPOSR-CUW primarily by subcontractors; however, NPOSR-CUW personnel apply some unrestricted herbicides. The assessment will focus on application records, storage, disposal practices, and environmental monitoring and subcontractor oversight.

Sampling and analysis of toxic and chemical materials, primarily PCBs and asbestos, conducted by subcontract laboratories will be reviewed to determine if these activities conform to regulatory and DOE Order specifications. The QA programs governing sampling and analysis of toxic or chemical materials will be evaluated, including any relevant internal QA audits performed by NPOSR-CUW.
A number of potential issues, noted during document review and discussions with site personnel, which will receive emphasis during the assessment include:

- Management of containers of flammable liquids in storage cabinets;
- Management of oil-filled electrical equipment and hydraulic equipment and documentation;
- Training of personnel to manage toxic and chemical materials;
- Lack of procedures to manage toxic and chemical materials; and
- Long-term storage of chemicals for potential future use.

7.2 RECORDS REQUIRED

Files will be reviewed as part of the environmental assessment, including documents not yet reviewed or received (e.g., potentially classified documents, individual files, documents not yet identified). Specific documents and files to be reviewed as part of the assessment include, but will not be limited to, the following:

- Toxic substances labeling and tracking system;
- Procedures for handling, control, and management of toxic substances, including excess chemicals and equipment or scrap;
- Waste Minimization Plan and/or Pollution Prevention Awareness Plan;
- PCB annual inventory documents;
- Inventory of current PCB-contaminated electrical equipment, or documentation of their removal;
- Records of inspections of PCB transformers;
- PCB handling, storage, and disposal procedures;
- Correspondence with fire department on PCB equipment;
- Training, handling, storage, disposal records, and environmental monitoring related to pesticide and herbicide use for both site personnel and subcontracted personnel;
- SOPs for pesticide/herbicide management;
- Pesticide/herbicide reports to regulatory agencies;
- Special procedures involving handling, storage, use and disposal of asbestos;
- Inventories/monitoring records for asbestos-containing materials;

- Spill control and emergency preparedness plans for each site and NPOSR-CUW-wide;
- Inventories and inspection records for ASTs;
- Audits or inspections pertaining to the toxic and chemical materials programs; and
- Other records as determined onsite.

8.0 QUALITY ASSURANCE

The Quality Assurance (QA) phase of the environmental assessment of NPOSR-CUW will consist of an evaluation of the QA procedures for general environmental programs and an evaluation of the sampling and analysis procedures performed by NPOSR-CUW onsite or offsite contractors conducting analyses on environmental samples, to ensure that they provide scientifically valid and defensible data.

The assessment will evaluate environmental protection programs in six areas: environmental surveillance, effluent monitoring, waste management, chemical and radiological analyses, decontamination and decommissioning, and inactive waste sites. Each of these areas require analyses of various sample media. Because there has been no development of the resources at NOSR-2, this site will not be within the scope of the quality assurance assessment. There will be a review in Casper of NOSR-1 and NOSR-3 documents, and there will be an evaluation of environmental sampling techniques by the technical specialists on Team B during his field work at NOSR-1 and NOSR-3. The primary focus of the quality assurance assessment will be the programs at NPR-3 in Wyoming.

8.1 ISSUE IDENTIFICATION

The QA procedures for NPOSR-CUW environmental programs will be reviewed for the effectiveness of implementation and compliance with DOE requirements. The review will include an assessment of the QA organization and structure developed by NPOSR-CUW contractors and DOE site offices to meet the requirements of Federal and state regulations, DOE Orders, QA standards, and EPA guidance manuals. QA activities will be specifically evaluated in accordance with DOE 5400.1, "General Environmental Protection Program," DOE 5700.6C, "Quality Assurance," and other DOE Orders in the 5400 series, as well as accepted industry practices and standards of performance. In addition, assessment of NPOSR-CUW QA programs will be coordinated with other environment subteam specialists to ensure that all potential quality assurance problems, related to environmental programs, are identified. Primary contacts are expected to be the QA representatives, NPOSR-CUW personnel involved in environmental monitoring activities, and NPOSR-CUW personnel responsible for the various environmental programs.

Aspects of QA programs related to environmental management by NPOSR-CUW contractors that will be reviewed include operator training, equipment calibration and maintenance, precision and accuracy evaluation, blank, split, and spike sample analyses, sample handling and chain-of-custody procedures, data reduction and validation, reports and documentation. Technical operations in the field will be observed to verify sample acquisition and
transfer practices. Standard operating procedures for sampling and analysis will be reviewed to ensure proper implementation and conformance with accepted practices. Internal quality assurance auditing practices will be examined. Furthermore, the results of interlaboratory test program participation by DOE contractor laboratories, as administered by the Environmental Protection Agency, will be evaluated. Quality assurance programs and procedures of offsite laboratories subcontracted by NPOSR-CUW organizations will be included in the assessment. The following issues will be specifically reviewed:

- Analytical lab certifications for sample analyses at analytical laboratories;
- QA oversight of offsite analytical laboratories;
- Contractual agreements with offsite laboratories;
- Environmental monitoring programs at NPR-3, NOSR-1, and NOSR-3;
- QA Plans and QA Project Plans activities administered by NPOSR-CUW;
- Environmental sample integrity at DOE contractor laboratories;
- Standard operating procedures for sampling and analysis at the NPOSR-CUW sites;
- Groundwater, surface water, ambient air and emissions monitoring at NPOSR-CUW sites.

8.2 RECORDS REQUIRED

Part of the environmental assessment of NPOSR-CUW will consist of a review of documents and files. This will include documents not previously reviewed or received, such as classified documents, individual files, and documents which have not been identified at this time. Some specific documents and files that will be reviewed in this phase of the assessment include, but are not limited to, the following:

- QA plans for NPOSR-CUW, DOE site offices and each site contractor;
- QA manuals and implementing procedures for the environmental monitoring and surveillance programs;
- Annual QA summary reports for NPOSR-CUW and site contractors;
- Environmental sampling and analysis procedures manuals;
- Procurement documents or contractual agreements for offsite analytical and radiological laboratory services;
- QA audits of environmental sampling and analysis at NPOSR-CUW and at site contractor facilities;
- QA audits of offsite analytical and radiological laboratories under contract to NPOSR-CUW directed facilities;
- Results of QA sample analysis of external performance evaluation samples from EPA or DOE Environmental Measurements Laboratory;
- Results of internal precision and accuracy studies of environmental analyses;
- Training records for sampling technicians and laboratory personnel at NPOSR-CUW and site contractors;
- Laboratory notebooks, data reporting forms, and sampling logbooks;
- Instrument maintenance, repair, and calibration records for laboratory and field equipment;
- Computer program validation and verification; and
- Other records as determined onsite.

9.0 RADIATION

The radiation portion of the assessment will include reviewing all activities, facilities and areas that involve or potentially involve the use of radiation or radioactive material (RAM). This will include current and past operations. Radiation protection programs at NPOSR-CUW will be assessed to determine compliance with the documents listed in the Tiger Team Manual, DOE Orders, and Federal and state regulations. These programs will also be reviewed against commonly accepted best industry practices and standards for performance.

The radiation portion of the assessment will consist of, but will not be limited to, evaluating environmental radiation protection programs in the following areas: naturally occurring radioactive materials (NORM); source control; source transfer/disposal; source leak checks; environmental surveys; decontamination and decommissioning; radiological analysis; and waste management. Radiation issues may overlap other areas to be evaluated during the assessment, thus, the radiation specialist will coordinate his reviews with the other team specialists to ensure all radiological issues are reviewed in sufficient detail. Because there has been no development of the resources at NOSR-2, this site will not be within the scope of the radiation assessment. There will be a review in Casper of NOSR-1 and NOSR-3 documents, and there will be a limited assessment of radiation issues by one of the technical specialists on Team B during his field work at NOSR-1 and NOSR-3. The primary focus of the radiation assessment will be the activities at NPR-3 in Wyoming.

9.1 ISSUE IDENTIFICATION

The general approach used in conducting the assessment will consist of interviews with NPOSR-CUW contractors, subcontractors, and DOE personnel. Additionally, inspections of selected NPOSR-CUW facilities and locations; observations of various operational processes; and reviews of documents, procedures, and records associated with the radiation protection program will be performed. The program will be evaluated by defining its scope, design, quality, and effectiveness of implementation with respect to protecting the public and the environment. Facility design, safety analyses, engineered safety features, and monitoring and control devices will be evaluated as they pertain to the potential release of RAM to the environment.
It is realized that the NPOSR-CUW sites do not now, nor have they in the past, processed RAM, and that the uses of radioactive materials may be limited to use of sealed sources and/or materials that have been contaminated with NORM during various operational processes. Thus, there may be no requirement for a routine radiological environmental surveillance program on or offsite. Nevertheless, the activity levels of NORM present at the sites are not insignificant, and environmental implications associated with NORM contamination may exist in the areas of contamination control, release of equipment, radiological monitoring, and radioactive waste management. Such scenarios in the oil and gas industry are an emerging environmental and regulatory problem nationally, and are also covered for DOE facilities in various sections of the DOE Orders such as in Chapter IV of DOE 5400.5. Therefore, monitoring equipment and associated maintenance and calibration requirements at NPOSR-CUW will be reviewed, along with records of radiological surveys for equipment shipments, materials disposition, and sampling results of waste streams for the presence of NORM.

Procedures for decontamination of equipment and areas contaminated with RAM will be evaluated. Historical records for equipment having undergone decontamination and release for unrestricted use will be reviewed. Of particular interest will be any surveys, sampling, and analysis records of areas that may have been inadvertently contaminated with RAM. Specific areas of interest will be equipment storage locations, laboratories, and various production areas. Further, disposition records for any sealed sources will be evaluated. Also, due to the high variability of the magnitude of NORM radon gas present in wells, analysis of effluents or residuals for concentration of RAM will be reviewed.

9.2 RECORDS REQUIRED

Specific documents and files to be reviewed as part of the assessment include, but will not be limited to, the following:

- Source leak test reports;
- Source transfer or disposal records;
- Survey reports of RAM packages;
- Radiation survey reports;
- Radioactivity data for any sampled media including wastewater, sludges, and resins;
- Environmental monitoring plan;
- Unplanned RAM release reports;
- Radioanalytical QA programs and procedures;
- Description of radiation monitoring equipment, practices, procedures (e.g., calibration, maintenance, source checks, etc.);
- Decontamination information, plans and data;
- Reports on any required decontaminations;
- Reports on any generated radioactive waste;
- Site emergency plan; and
- Site Radiation Protection Plan.

10.0 INACTIVE WASTE SITES

The inactive waste sites portion of the assessment will focus on the historic handling, storage, and disposal of hazardous substances, including compliance with CERCLA and SARA requirements, RCRA corrective action activities, and inactive waste site identification and cleanup activities. Particular attention will be paid to compliance with Federal, state, and local laws and regulations and compliance with DOE Orders and guidelines.

The assessment of inactive waste sites will be conducted in coordination with the groundwater, surface water, toxic and chemical materials, air, and waste management technical specialists. Compliance with SARA Title III will be evaluated by the air specialist.

10.1 ISSUE IDENTIFICATION

There are few records of past chemical and waste management practices at the NPOSR-CUW sites. However, there is some evidence of chemical contamination associated with past operational and storage practices at NPOSR-CUW. Some general areas which will be examined will include storage locations with known or suspected soil contamination; areas which have received either fuel or chemical spills; areas where underground storage tanks have been removed; warehouses, laydown yards, and maintenance areas; subcontractor storage areas; and former and current solid waste landfills. Some specific areas of concern at NPR-3 include:

- Mud disposal pits, especially those where chromium was added to the mud;
- Tank rings which have received waste materials;
- Buried herbicide drums;
- Drains which received solid and/or liquid wastes, especially those to which lines were pigged, and
- Underground pipelines, both abandoned and active, which have the potential to leak.

Some specific areas of concern at NOSR-1 and NOSR-3 include:

- Drains which received solid and/or liquid wastes;
- The Anvil Points and Rulison shale piles; and
- The former Anvil Points and Rulison plants.
No areas of concern have been identified at NOSR-2; however, since there is public access to the property, aerial photos will be reviewed to identify potential dump sites. Forty per cent of the NOSR-2 land surface is located within the Uintah-Ouray Indian Reservation. Aerial photos of this property will not be reviewed unless upon evaluation it is determined that there are potential significant risks for DOE associated with any mismanagement of this surface property.

The adequacy of the methodology for identifying and characterizing inactive waste sites will be evaluated. This will include a review of the characterization and prioritization of the identified sites. Additionally, the scheduling and planning of remedial activities will be assessed, including workplan development, field data collection, and the status of remedial actions. It is our understanding that at NPR-3 a CERCLA Phase I assessment was conducted, and there was an investigation of an area suspected to have been a burial site for pesticide drums. A preliminary assessment was conducted of the Anvil Points plant area at NOSR-3. There has been no investigation of NOSR-1 in Colorado nor NOSR-2 in Utah, and NPOSR-CUW personnel have expressed concern regarding the adequacy of the investigative work for NPR-3.

A review of NPOSR-CUW's community relations program will be included in the inactive wastes portion of the assessment. A verification of NPOSR-CUW's administrative records file will be performed.

The assessment will also cover release reporting procedures, including the identification of substances with reportable quantities, procedures for evaluating releases subject to notification requirements, and recordkeeping and training activities. It is the Team's understanding that NPOSR-CUW is not subject to SARA Title III. EPA Form R reporting requirements. The justification for this determination will be reviewed and will be coordinated by the air specialist.

The general approach to this SARA assessment will include an inspection of NPOSR-CUW facilities to identify sources of hazardous materials; review of site-wide inventory of hazardous materials, emergency response plans, notification procedures, evacuation plans, training programs for site personnel, and procedures for release mitigation; interviews with the chemical coordinator, safety personnel, and regulatory agencies.

10.2 RECORDS REQUIRED

The assessment of inactive waste sites will require a review of many records and files, including some not yet received from NPOSR-CUW:

- CERCLA § 103 notifications and updates;
- Site specific plans for environmental restoration;
- Property transfer records, including that property transferred to the Public Service Company of Colorado;
- Records regarding the status of inactive waste sites;
- Environmental incident reports;
- Analytical data for remedial activities;
- Spill reports and releases notifications, including Unusual Occurrence Reports and Minor Release Reports;
- Consent orders;
- Community Relations Plans;
- Records regarding ongoing site identification;
- Historical aerial photographs and site plans;
- UST information and tank removal reports;
- Draft Phase I installation assessment;
- Remedial design and construction plans; and
- Orders and decision documents regarding remedial actions.

11.0 NATIONAL ENVIRONMENTAL POLICY ACT

The objectives of the National Environmental Policy Act (NEPA) assessment are (1) to evaluate the NEPA management structure and review processes of the site office and headquarters; (2) to identify problems that may lead to inappropriate procedures or inadequate NEPA documentation; and (3) to ensure consistency with the NEPA Council on Environmental Quality Regulations, and with the DOE NEPA regulations, Orders, and memoranda. The overall goal of the NEPA assessment is to foster improved and environmentally sound decision-making for those DOE actions having the potential for significant impacts on the environment.

The NEPA portion of the assessment will be conducted in coordination with other Environmental Subteam technical specialists but primarily the biota, waste management, inactive waste site, and surface water specialists.

11.1 ISSUE IDENTIFICATION

A NEPA protocol, developed by the Office of NEPA Oversight (EH-25) and ORNL, includes worksheets that focus the team's line of inquiry to ensure a comprehensive, consistent approach to the assessment. The content of the worksheets is divided into seven main areas as follows:

- Overview of NEPA issues;
- Management structure (overall organization, training, use of contractors, recordkeeping, etc.);
- NEPA compliance planning;
- NEPA/CERCLA, NEPA/RCRA integration;
- Determination of level of NEPA review required;
• Procedural aspects of NEPA documents; and
• Technical content of NEPA documents.

The general approach to the assessment will include interviews with DOE Headquarters, DOE/NPOS-CUW, and JBEC staff responsible for the NEPA procedures and review process; NPOS-CUW project and program managers; the legal and public relations staff and the classification manager; and others, as the need arises. The use of categorical exclusions (CX); memoranda-to-file, and action description memoranda (ADM) will be evaluated for consistency with DOE guidelines.

11.2 RECORDS REQUIRED

As part of the NEPA assessment, files will be reviewed, including documents not previously received or reviewed (e.g., potentially classified documents, individual files, and/or documents not previously identified). Specific documents and files to be reviewed as part of the assessment include, but will not be limited to, the following:

• Records that locate, identify, and describe both onsite and offsite occurrences of the following resources that may be affected by site activities: endangered and threatened species and their critical habitats; bald and golden eagles and migratory birds and their nests; wild horses and burros; waterways, including waters and navigable waters of the United States, floodplains, wetlands, and wild and scenic rivers; national recreation trails; wilderness and wilderness study areas; sacred Native American sites; prime/unique farmland; prehistoric and historic ruins and monuments; archaeological and historic sites; and other Federal lands (e.g., National Forests).

• Documentation of consultation with agencies responsible for the administration of the resources listed above (e.g., Section 7 consultation with the Department of the Interior on endangered species).

• Policies and procedures for implementing related regulations (e.g., TSCA, RCRA, CERCLA, Clean Water Act, Clean Air Act, Safe Drinking Water Act, and Noise Control Act).

• Any NPOS-CUW-specific or Field Office NEPA guidance or policies.

• Capital budget files and other appropriate records or proposed actions or initiated changes in operation.

• Records of ongoing and proposed actions or initiated changes in operation (e.g., major systems acquisitions; major projects; work being done under contract to others; DOE-sponsored research; activity data sheets; conceptual design reports; and lists of general plant projects, line items, maintenance projects, and work orders).

• Lists of ongoing and proposed RCRA closures and corrective actions.

• All NEPA-integrated documents prepared in support of remedial action.

• State or local "NEPA-type" statutes and regulations.

• Description of any litigation related to NEPA.

• Memoranda to files related to ongoing actions.

• Documents used to make, support, or record NEPA determinations (e.g., Environmental Evaluations, Environmental Checklists, CXs, or ADMs) prepared since January 1990.

• All NPOS-CUW environmental assessments (EA) and environmental impact statements (EIS) that are still used for assessment of all ongoing or proposed actions.

• Documents and studies that are cited in support of major aspects of site EAs and EISs (e.g., biological assessments for endangered species or engineering details of projects).

• Monitoring and mitigation reports available for EAs and EISs.

• Printout from a data base which tracks NEPA documents (if such a data base exists).
Appendix C

ENVIRONMENTAL SUBTEAM DAILY AGENDAS
### OVERALL SCHEDULE OF ENVIRONMENTAL SUBTEAM ACTIVITIES

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<td><strong>Travel</strong></td>
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<td>1300 NEPA findings to site for 6/22 FAR</td>
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<td><strong>Team A:</strong></td>
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<td><strong>Team B:</strong></td>
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<td>travel to Rifle</td>
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<td>1400 NEPA FAR Assessment continues</td>
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<tr>
<td>1630 Daily Debrief Conference Room B</td>
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<th>Tuesday 6/30</th>
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<th>Thursday 7/2</th>
<th>Friday 7/3</th>
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<td>A: onsite, findings development</td>
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<td>B: Casper, continue assessment</td>
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<tr>
<td>0900 IWS FAR</td>
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<th>Thursday 7/9</th>
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<th>Saturday 7/11</th>
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<tbody>
<tr>
<td><strong>Team: travel to Casper</strong></td>
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<tr>
<td>1830 WM findings to site for 7/7 FAR</td>
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|              |              |              |                |               |             |               |
| Casper       |             |              |                |               |             |               |
| 1100 WM FAR  |             |              |                |               |             |               |
| 1300 QA findings to site for 7/8 FAR |             |              |                |               |             |               |
| 1200 AIR FAR |             |              |                |               |             |               |
| 2030 AIR and partial IWS (1) findings to site for 7/8 FAR |             |              |                |               |             |               |
| Casper       |             |              |                |               |             |               |
| 0930 QA FAR  |             |              |                |               |             | MEER           |
| 1400 AIR FAR |             |              |                |               |             | MEER           |
| 1200 SW/DW findings to site for 7/9 FAR |             |              |                | MEER         | Finalize Report | MEER           |

**Notes:**
- NEPA: National Environmental Policy Act
- FAR: Final Assessment Review
- QA: Quality Assurance
- IWS: Interim Waste System
- TCM: Technical Change Management
- DOE: Department of Energy
## OVERALL SCHEDULE OF ENVIRONMENTAL SUBTEAM ACTIVITIES (Continued)

<table>
<thead>
<tr>
<th>Sunday 7/12</th>
<th>Monday 7/13</th>
<th>Tuesday 7/14</th>
<th>Wednesday 7/16</th>
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<th>Friday 7/17</th>
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<tr>
<td>Team Off</td>
<td>Draft report finalized</td>
<td>Key findings to management subteam</td>
<td>Draft report to printer</td>
<td>Preparation for closeout</td>
<td>Administrative wrap-up</td>
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<td>Sunday 7/19</td>
<td>Monday 7/20</td>
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<td>Team Off</td>
<td>NPOS-CUW Closeout</td>
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<td></td>
<td>Travel Home</td>
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</tbody>
</table>

**Team A**
- Lee Banicki
- Rich D'Emilio
- Don Neal
- Reann Reid
- Bill Rhodes
- Lorene Sigal
- Sarah Simon
- Joe Swiniarski

**Team B**
- Al Sikri
- Bill Hasselkus
- Joe Delaney
- John Pulliam
- James Rea
- Cliff Summers

**FAR:** Factual Accuracy Review
## Detailed Schedule of Environmental Subteam Activities

<table>
<thead>
<tr>
<th>Week 1</th>
<th>Monday 6/15/92</th>
<th>Tuesday 6/16/92</th>
<th>Wednesday 6/17/92</th>
<th>Thursday 6/18/92</th>
<th>Friday 6/19/92</th>
<th>Saturday 6/20/92</th>
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</thead>
<tbody>
<tr>
<td><strong>Sarah Simon</strong></td>
<td><strong>Air</strong></td>
<td><strong>am</strong></td>
<td>Safety orientation, environmental briefing</td>
<td>Interview: 0730-0830 J. McKenna re: operations</td>
<td>Inspection: 0900-1000 One or two steam generators</td>
<td>Interviews: 0730 -0830 A. Tyler re: SARA III 0830-0930 D. Stagg re: SARA III 0930-1030 D. Richards re: SARA</td>
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<td>Interview: T. Doll L. McLaughlin</td>
<td>Interview: 1030-1130 E. Reish re: production emissions 1130-1430 B. Bandorick re: monitoring, permits, inventories</td>
<td>Inspection: Fireproof Building with J. McKenna</td>
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<td>Interview: 1030-1100 A. Hagen re: gas operations</td>
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<td>Interviews: 0900 Dan Luera re: compliance activities 1030 B. Bandorick re: air management</td>
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<tr>
<td><strong>Week 2</strong></td>
<td><strong>Monday 6/22/92</strong></td>
<td><strong>Tuesday 6/23/92</strong></td>
<td><strong>Wednesday 6/24/92</strong></td>
<td><strong>Thursday 6/25/92</strong></td>
<td><strong>Friday 6/26/92</strong></td>
<td><strong>Saturday 6/27/92</strong></td>
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<tr>
<td><strong>Sarah Simon</strong></td>
<td><strong>Air</strong></td>
<td><strong>am</strong></td>
<td>Interviews: 0730-0900 D. Miles re: air program oversight 1000 Lt. B. Williams re: air program oversight</td>
<td>Followup interviews: 0800 Donna Richards re: air documents, SARA 311-3 0900 C. R loved re: purchasing D. Peters re: gas testing</td>
<td>Inspection: H2S monitoring</td>
<td>Followup interview: 0800-0900 P. Morgan re: air management programs</td>
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<td></td>
<td><strong>pm</strong></td>
<td>Document review</td>
<td>Interviews: C. Garvin re: purchasing 1300-1400 J. Woten re: QA of air monitoring program 1400 B. Buh re: facility projects</td>
<td>Interview: 1330 M. Foedick</td>
<td>Document review</td>
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## Detailed Schedule of Environmental Subteam Activities (Continued)

### Week 3

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<th>Friday 7/3/92</th>
<th>Saturday 7/4/92</th>
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<tbody>
<tr>
<td>AM</td>
<td>Sarah Simon</td>
<td>Air</td>
<td>Develop findings</td>
<td>Develop findings</td>
<td>Develop findings</td>
<td>Holiday</td>
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<td>PM</td>
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<td>Develop findings</td>
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### Week 4

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<th>Friday 7/10/92</th>
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<tbody>
<tr>
<td>AM</td>
<td>Sarah Simon</td>
<td>Air</td>
<td>Draft findings</td>
<td>Draft findings</td>
<td>Finalize findings</td>
<td>Travel home</td>
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<tr>
<td>PM</td>
<td></td>
<td>Travel</td>
<td>Draft findings</td>
<td>Findings to site</td>
<td>1400 FAR</td>
<td>Finalize findings</td>
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### Week 1

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<tr>
<th>Time</th>
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<th>Tuesday 6/16/92</th>
<th>Wednesday 6/17/92</th>
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<th>Saturday 6/20/92</th>
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<tbody>
<tr>
<td>AM</td>
<td>Cliff Summers</td>
<td>Surface Water/Drinking Water</td>
<td>0730 meet JBEC Rep at Rusty Cannon</td>
<td>Safety Orientation, Environment briefing</td>
<td>Interview: J. Virgona re: historical waste management practices</td>
<td>Develop performance objectives and findings statements</td>
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<td>PM</td>
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<td>0800 P. Morgan re: Observe groundwater sampling event, surface water sampling event, and sample prep for shipping</td>
<td>1300-1430 E. Cooley re: site history with respect to surface water management</td>
<td>1430-1600 P. Morgan re: NPDES issues</td>
<td>Develop performance objectives and findings statements</td>
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<td>Interview/inspections: 0800 P. Morgan re: Observe groundwater sampling event, surface water sampling event, and sample prep for shipping</td>
<td>Interview P. Morgan re: SPCC Plan following sampling</td>
<td>Travel to Casper</td>
<td>Inspect for SPCC concerns</td>
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<td>Interviews: 0800-0900 P. Morgan re: surface water and drinking water concerns at NOSRe 0930-1130 M. Johnson re: SPCC</td>
<td>1300-1430 E. Cooley re: site history with respect to surface water management</td>
<td>1430-1600 P. Morgan re: NPDES issues</td>
<td>0700-0800 Orientation 0800-1200 Windshield tour of NPR-3</td>
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## Detailed Schedule of Environmental Subteam Activities (Continued)

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<td>Holiday</td>
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<td>Cliff Summers</td>
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<td>Draft findings</td>
<td>Findings to site</td>
<td>Travel home</td>
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<tr>
<td>Week 1</td>
<td>Monday 6/15/92</td>
<td>Tuesday 6/16/92</td>
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<tr>
<td>James Re</td>
<td>Groundwater/Soils, Sediments, and Biota</td>
<td>Meet JBEI Rep at Rusty Cannon</td>
<td>Field tour with D. Newquist</td>
<td>Inspection: 0800 Observe groundwater sampling event with P. Morgan and L. Fives</td>
<td>Inspections: Field inspections of NOSR-3 gas wells with L. Fives</td>
<td>0700-0800 Orientation 0800-1200 Windshield tour NPR-3</td>
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<tr>
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<td>Safety Orientation, Environmental Briefing</td>
<td>Inspections: Inspect &quot;on top&quot; Sample of core holes DOE cabin area</td>
<td>Interviews: 0800-1200 P. Morgan re: groundwater sampling during sampling event 1000-1100 M. Johnson re: historical activities</td>
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<td></td>
<td></td>
<td>Interview: J. Virgona re: oil shale mining, retorting, D&amp;D</td>
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<td>James Rea</td>
<td>am Interview: J. Harja re: groundwater appropriation permits D. Miles re: observation wells at Flood Projects</td>
<td>Develop findings</td>
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<td>Holiday</td>
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<td>pm Interview: D. Doyle re: contaminated soil</td>
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<td>James Rea</td>
<td>am Draft findings</td>
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<td>Findings to site</td>
<td>1400 FAR 1730 Followup meeting</td>
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<tr>
<td>Don Neal</td>
<td>am</td>
<td>Safety orientation, environmental briefing</td>
<td>Inspections: Well sites, Test satellites, Tank batteries, and Retaining pits</td>
<td>Interview: 0730-0830 J. VanderVoort re: UST management and records Inspections: USTs and locations where USTs have been removed with VanderVoort South Terminal Pig Pits Interview: 1030-1130 P. Leuff re: waste generator training, records</td>
<td>Inspection: Hazardous waste storage pad Interview: 0730-0830 A. Hagen re: Gas operations Inspections: LTS Gas Plant Steam generators Compressor station</td>
<td>Inspection: Landfill Solid waste landfill Interviews: 0730-0830 L. Harrison 0900-1000 A. Tyler 1000-1100 J. McKenna</td>
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<td>pm</td>
<td>Windshield tour NPR-3</td>
<td>Inspection: Wyoming Oil and Gas Conservation Commission records</td>
<td>Interviews: B. Dunsie, WYDEQ re: waste management requirements, concerns 1500-1530 V. Huntington re: waste management training records Review WYDEQ files</td>
<td>Inspection: Land (road) applications Interview: 1200-1300 T. Doll Inspection: Water treatment facilities Water disposal facility</td>
<td>Document review</td>
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<tr>
<td>Don Neal</td>
<td>am</td>
<td>Review UST records</td>
<td>Interviews: 0730-0930 D. Bradley 0830-0900 D. Richards 1000-1030 J. McKenna 1100-1130 D. Crnich Review: Hazardous waste records Landfill operating records</td>
<td>Develop findings</td>
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<td>Interviews: 1300-1400 C. Garvin 1430-1530 R. Miller-Trumbull</td>
<td>Interview: 1430-1530 D. Miles re: DOE oversight</td>
<td>Followup interviews</td>
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575
### Detailed Schedule of Environmental Subteam Activities (Continued)

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<tr>
<td>Don Neal am</td>
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<td>Waste Management</td>
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<td>Findings to site</td>
<td>Followup meeting with site</td>
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<td>Toxic and Chemical Materials</td>
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<td>pm</td>
<td>Windshield tour NPR-3</td>
<td>Inspection: Warehouse Outside drum storage Excess yard Interview: 1430-1530 S. Tischer re: chemical purchasing</td>
<td>Inspections: Chemical dock Dog house</td>
<td>Review: PCB records</td>
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Develop performance objectives and findings statements.
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<tr>
<td>Richard D’Errilio</td>
<td>Interview: D. Miles re: DOE TCM oversight</td>
<td>Followup inspections</td>
<td>Draft findings</td>
<td>Interview: P. Morgan re: pesticide management</td>
<td>Findings to site</td>
<td>Travel home</td>
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<td>Toxie and Chemical Materials</td>
<td>Followup interviews: B. Copp re: PCB D. Richardson re: pesticide storage, disposal management J. McKenna re: pesticide application</td>
<td>Develop findings</td>
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<tr>
<td>pm</td>
<td>Re-review TCM management procedures</td>
<td>Develop findings</td>
<td>Draft findings</td>
<td>1400 FAR</td>
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<td>Inspections: Inspect pole mounted transformers with S. Craine Followup inspection of the gas plant AST</td>
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<tbody>
<tr>
<td>Joe Swinierski</td>
<td>Safety orientation and environmental briefing</td>
<td>Interviews: 0730-0830 D. Richard re: environment sampling and recordkeeping 0900-1000 A. Tyler re: environment sampling</td>
<td>Observe drill rigs, evaporation pits, south terminal Interviews: 1030-1130 B. Bandorick re: air sampling QA (with Environmental Subteam air specialist) Review operating procedures</td>
<td>Observe storage, warehouse storage area Review operating procedures and policy procedures</td>
<td>Interviews: 0800-0900 D. Miles re: DOE QA efforts 1030-1130 P. Morgan re: JBE sampling and analysis program</td>
<td>Develop performance objectives and findings statements</td>
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<td>Quality Assurance</td>
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<td>pm</td>
<td>Windshield tour of NPR-3</td>
<td>Interview: 1300-1400 J. Woten re: JBE environmental protection QA programs</td>
<td>Interview: 1400-1500 K. Brown re: radon, other rad sampling, analysis</td>
<td>Interview: 1400-1500 G. Groome re: QA efforts</td>
<td>Inspection: Energy lab</td>
<td>Interview: 1500-1600 D. Newquist re: DOE QA</td>
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<tr>
<td>Joe Swiniarski, Quality Assurance</td>
<td>At ES&amp;H building onsite</td>
<td>Develop findings</td>
<td>Observe NPDES sampling</td>
<td>Develop findings</td>
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<td>Travel home</td>
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<td>Review air, water surveillance records</td>
<td>Followup interviews</td>
<td>Develop findings</td>
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<td>Followup interviews</td>
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<td>pm</td>
<td>Examine onsite records archives</td>
<td>Interview: D. Crnich</td>
<td>Interview: D. Brady</td>
<td>Develop findings</td>
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<td>Observe potable water sampling event and prep for delivery to lab offsite</td>
<td>1400 Examine Offsite records archives</td>
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<td>Inspection: Nenewa County Health Department Lab</td>
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<td>Joe Swiniarski, Quality Assurance, Travel</td>
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<tr>
<td>William Rhodes</td>
<td>Orientation</td>
<td>Interview: 0800-0900 K. Brown re: radiation protection program</td>
<td>Interviews: 0800-0845 D. Miles re: subcontractor work: Geophysical logging, Tracers for logging, Fluid density measurement, and Pipeline welding 0900-1000 S. Tischer re: same topics as above</td>
<td>Tour of areas that may accumulate NORM</td>
<td>Interviews: 0800-0900 P. Morgan re: radiation environment protection</td>
<td>Develop performance objectives and finding statements</td>
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<td>Radiation</td>
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<td>Windshield tour NPR-3</td>
<td>Interview: 1300-1400 G. Groome re: radiation environment protection</td>
<td>Interview: D. Doyle re: self-assessment</td>
<td>Continue tours</td>
<td>Tour subcontractor radiochemistry lab</td>
<td>Develop performance objectives and finding statements</td>
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<td>William Rhodes</td>
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DETAILED SCHEDULE OF ENVIRONMENTAL SUBTEAM ACTIVITIES (Continued)
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<tbody>
<tr>
<td>Joe Delaney</td>
<td>am</td>
<td>0730 meet JBEC Rep at Rusty Cannon</td>
<td>Review of shale pile preliminary assessment</td>
<td>Inspection: 0800 Tour well sites, other inactive waste sites with D. Newquist and M. Johnson</td>
<td>Interview: 0830-1100 P. Morgan re: preliminary assessments</td>
<td>0700-0800 Orientation 0800-1200 Windshield tour NPR-3</td>
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<tr>
<td>Inactive Waste Sites</td>
<td></td>
<td>Safety orientation, environmental briefing</td>
<td>Inspections: Water tank area, Drum disposal area, and Evaporation ponds adjacent to shale pile</td>
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<td></td>
<td>pm</td>
<td>Field tours: Water treatment plant Mine bench Quonset Warehouse Shale pile</td>
<td>Inspection: Rulison Plant</td>
<td>Interviews: 1300-1400 E. Cooley re: historical activities D. Newquist re: preliminary assessments, site history, spill reporting, site development planning</td>
<td>Travel to Casper</td>
<td>Tour of inactive waste sites</td>
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<tbody>
<tr>
<td>Joe Delaney</td>
<td>am</td>
<td>Inspections: Old Crossing Plant Tank Rings Camp No. 1 Well 82-23-X-10 Bad Oil Facility</td>
<td>Interviews: D. Miles re: IWS programs and spill reporting G. Groome re: spill reporting disposal practices</td>
<td>Interview: Truck Shop Interview: D. Luers re: spill reporting</td>
<td>Interview: K. Roberts re: property transfers</td>
<td>Document review Develop findings</td>
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<tr>
<td>Inactive Waste Sites</td>
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<td>Interview: 1300-1400 D. Doyle re: drilling mud disposal practices, location of mud disposal areas</td>
<td>Interview: 1230-1430 Donna Richards re: records for investigative and remedial activities, property transfer records, and release reports Review analytical data for remedial activities, road applied materials,</td>
<td>Interviews: D. Newquist re: property transfers B. Buhl re: spill reporting</td>
<td>Document review Develop findings</td>
<td>Document review Draft findings Findings to site</td>
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### DETAILED SCHEDULE OF ENVIRONMENTAL SUBTEAM ACTIVITIES (Continued)

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<tbody>
<tr>
<td>Joe Delaney am Inactive Waste Sites</td>
<td>Factual Accuracy Review</td>
<td>Travel home</td>
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<tbody>
<tr>
<td>John Pulliam am NEPA</td>
<td>0730 meet JBEC Rep at Rusty Cannon Safety orientation, environment briefing</td>
<td>Continue tour NOSR-1 and NOSR-3 Travel to Casper</td>
<td>Review site documents Interview: 1030-1130 D. Sokal, D. Miles, (conference call)</td>
<td>Draft findings, overview</td>
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<td>Findings to environmental subteam management for review</td>
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<td>pm Inspections: Tour NOSR-1 and NOSR-3</td>
<td>Review site documents</td>
<td>Site tour</td>
<td>Draft findings, overview</td>
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<td>Findings to site</td>
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<tr>
<td><strong>Lorene Sigal</strong></td>
<td>am NEPA</td>
<td>Safety orientation, environmental briefing</td>
<td>Interviews: 0800-0900 R. Williams re: NEPA 0900-1000 Donna Richards Mike Taylor</td>
<td>Interviews: 0800-0900 C. Foot re: NEPA 0900-1000 J. Rochelle re: NEPA 1030-1130 Dan Sokal, D. Miles, J. Pulliam (conference call)</td>
<td>Interviews: Dan Luers L. Giangiacomo</td>
<td>Findings to Environmental Subteam management for review</td>
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<td>Review site documents</td>
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<td></td>
<td>am</td>
<td>Interviews: 1230-1430 D. Miles re: NEPA Lt. Bobbie Williams</td>
<td>Interviews: 1300-1400 Daniel Brady re: NEPA 1400-1500 J. Boulanger re: NEPA</td>
<td>Sites Tour</td>
<td>Draft findings, overview</td>
<td>Interview: 1300-1400 Dan Newquist re: NEPA</td>
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<td>Review site documents</td>
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<td><strong>Lorene Sigal</strong></td>
<td>am NEPA</td>
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<td>Travel home</td>
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<td>Finalize findings</td>
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Appendix D

ENVIRONMENTAL SUBTEAM CONTACTS/INTERVIEWS
(Attached on Microfiche)

Appendix E

LIST OF DOCUMENTS REVIEWED BY ENVIRONMENTAL SUBTEAM (Attached on Microfiche)
Appendix F

OSHA NONCOMPLIANCES
(Attached on Microfiche)

Appendix G

DEFINITIONS OF ENVIRONMENTAL SUBTEAM CAUSAL FACTORS AND CONTRIBUTING FACTORS
### Definitions of Environmental Subteam Causal Factors and Contributing Factors

<table>
<thead>
<tr>
<th>Causal Factor</th>
<th>Definition</th>
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<tbody>
<tr>
<td>Policy</td>
<td>Evaluate if ineffective, outdated, or nonexistent policies contributed to the finding.</td>
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<tr>
<td>Policy Implementation</td>
<td>Ascertained if written policies reflecting Federal, state, and local laws and regulations, codes, and standards were appropriately disseminated, implemented, and updated.</td>
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<tr>
<td>Risk</td>
<td>Evaluate if the site personnel responsible for a situation contributing to a finding have assessed and were aware of the relative degree of risk involved in the action.</td>
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<tr>
<td>Procedures</td>
<td>Identify if written procedures that have been prepared to effectively implement site policy, DOE Orders, and Federal, state, and local laws and regulations were a contributing factor to the finding. Determine if unfamiliarity with, or unavailability of those procedures contributed to the finding.</td>
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<tr>
<td>Personnel</td>
<td>Identify if the educational and work experience backgrounds for personnel holding responsible positions contributed to the finding. Determine if the level of personnel knowledge about the technical and safety aspects of their jobs contributed to the finding.</td>
</tr>
<tr>
<td>Resources</td>
<td>Ascertained if the number of personnel or extramural resources available to a job were a contributing factor to the finding. Evaluate if inadequacies in facilities and equipment were a contributing factor to the finding.</td>
</tr>
<tr>
<td>Training</td>
<td>Identify if adequate personnel training on implementing site policy, DOE Orders, and Federal, state, and local laws and regulations was a contributing factor to the finding.</td>
</tr>
<tr>
<td>Policy Change</td>
<td>Evaluate if changes in site mission, function, operation, and established requirements, which rendered existing policies or procedures inadequate or inappropriate, were contributing factors to the finding. Evaluate if the timeliness and effectiveness of changes to site and DOE policy, and the implementing procedures, were a contributing factor to the finding.</td>
</tr>
<tr>
<td>Appraisals/Audits/Reviews</td>
<td>Determine if ineffective or insufficient appraisals/audits/reviews or oversight were contributing factors to the finding. The factor should only be used as a secondary contributing factor to the finding.</td>
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<tr>
<td>Design</td>
<td>Evaluate if inadequate design of a system was a contributing factor to the finding.</td>
</tr>
<tr>
<td>Human Factors</td>
<td>Ascertained if human factors, such as fatigue or deliberate circumvention of a safety system, were contributing factors to the finding.</td>
</tr>
<tr>
<td>Barriers and Controls</td>
<td>Determine if inadequacies in established barriers and controls, both administrative and physical, including operational readiness, routine inspection, and preventive maintenance, and/or a lack of these controls, contributed to the finding.</td>
</tr>
<tr>
<td>Supervision</td>
<td>Identify if ineffective supervisory controls for implementing policies, procedures, standards, laws, etc., were a contributing factor to the finding.</td>
</tr>
<tr>
<td>Quality Assurance/Quality Control</td>
<td>Identify if inadequacies in the quality assurance/control program were causal factors to the identified finding. This includes inadequate followup to previously identified findings.</td>
</tr>
</tbody>
</table>
An onsite Tiger Team Assessment hotline (1-800-824-1702) for collecting information was established for the NPOSR-CW assessment and operated between June 22, 1992, and July 13, 1992. The hotline was established to enable NPOSR-CW personnel and the general public to report specific environment, safety, and health concerns. Notices of the hotline were made through a staff memorandum as well as through a local newspaper. Notices also inform NPOSR-CW personnel that information relative to waste, fraud, abuse, misconduct, and environment and safety issues of a criminal nature could be reported directly to the DOE Office of the Inspector General at either 1-800-541-1625 or 202-586-4073.

This appendix summarizes the telephone calls received on the hotline and the responses or actions taken.
NAVAL PETROLEUM AND OIL SHALE RESERVES
TIGER TEAM ASSESSMENT HOTLINE REPORTS AND RESPONSES

CONTROL #1
DATE: June 23, 1992
NATURE OF CONCERN: The caller was concerned with practices for handling employee compensation matters.
RESPONSE: The caller's concerns were outside the scope of the Tiger Team assessment. The hotline call was referred to the Director, DOE NPOSR-CUW, for response.

CONTROL #2
DATE: June 24, 1992
NATURE OF CONCERN: The caller expressed a concern that oil sales and production records did not correspond, resulting in missing or unaccounted for oil that may have been disposed of at NPR-3 during the period of 1981-1987. The caller was also concerned that there had been improper disposal of oil at NPR-3.
RESPONSE: The caller's first concern was outside the scope of the Tiger Team assessment. The concern had previously been reported to and investigated by the Inspector General. The second concern was referred to the Environmental Subteam for response.

The Waste Management Specialist conducted an investigation of crude oil disposal practices at NPR-3. There were no indications that oil was being disposed of improperly. Prior to 1988, there were instances of tank bottoms and other oil production wastes being deposited within the old tank rings at NPR-3. However, this practice has been discontinued and there is no evidence that large-scale dumping has occurred of the type indicated by the concern. It does not appear that the concern is related to environmental problems at NPR-3.

CONTROL #3
DATE: June 30, 1992
NATURE OF CONCERN: Same caller as number one. The caller reiterated the concern addressed in Control #1, and expressed an additional concern relevant to the assessment. The caller stated that JBECS supervisors are underqualified and not selected based on education and experience.
RESPONSE: This concern was forwarded to the Management Subteam for response. While the Tiger Team did not examine the educational and experience qualifications of supervisors at JBECS, the Tiger Team's review of the JBECS training program indicates that there is a lack of formal supervisory training, and there is not a formal career development program oriented towards identifying and grooming line manager candidates. Although there are instances of employees being promoted into the management ranks, the situations are not common.

These observations were identified as part of the Management Subteam findings in Chapter 5.0 of this report.

CONTROL #4
DATE: July 10, 1992
NATURE OF CONCERN: Caller was a former contractor employee who had concerns regarding unfair treatment on employee compensation issues.
RESPONSE: The caller was contacted by the Assistant to the Tiger Team Leader, and informed of avenues of appeal for those concerns.

CONTROL #5
DATE: July 13, 1992
NATURE OF CONCERN: The caller raised several issues including improper waste disposal practices onsite; employee misuse of government property; inappropriate administration of the award fee process; and qualifications and experience of DOE personnel responsible for oversight of ES&H.
RESPONSE: The Environmental Subteam and Management Subteam were requested to respond to the call. The call was also forwarded to the Inspector General's office for investigation of issues outside of
the scope of the Tiger Team assessment, including the allegation of employee misuse of government property.

In response to the caller's concern regarding waste disposal practices, the Environmental Subteam conducted interviews, inspections, manifest reviews, and reviewed the Environmental Survey Preliminary Report (2/89). The Environmental Subteam was not able to confirm or disprove the caller's allegations. This concern was also transmitted to the Inspector General for further investigation.

The Management Subteam evaluated and addressed the administration of the cost-plus-award-fee process. The evaluation is detailed in the Tiger Team Assessment Report, Management Subteam Finding MF-17.

The Tiger Team has addressed the general technical issue of the qualifications and experience of the DOE personnel responsible for ES&H in Management Subteam Findings MF-6 and MF-15.

Appendix I

WORKING LEVEL EMPLOYEE PERCEPTIONS OF NPR-3 HEALTH AND SAFETY PROGRAM
APPENDIX I

Working Level Employee Perceptions
of NPR-3 Health and Safety Program

Introduction

The employees at NPR-3 in general and the working level employees (i.e., hourly employees actually performing the operations, maintenance, well servicing, etc.) specifically are not represented by a union or an employee organization. Hence, no single committee or organization speaks for the working level employees to assure that they are satisfied with the health and safety program implementation as it pertains to their own individual tasks.

To ascertain the working level employee perception of the implementation of the health and safety program at NPR-3 as it applies to their own task, this special review was initiated.

Purpose

The purpose of this review was:

1. To determine if the working level employees perceived that the NPR-3 site is a safe place to work.
2. To determine if the working level employees had possession of and used an established mechanism at NPR-3 to express their health and safety concerns.
3. To determine if the working level employees’ safety concerns at NPR-3 were acted upon to their satisfaction.

Methodology

Between the period of June 22, 1992, to July 2, 1992, I spent time with the working level employees at the NPR-3 facility interviewing personnel; observing work; and making myself available in the lunch rooms and break areas to anyone who wanted to discuss safety-related concerns. The Tiger Team Leader, myself, and members of the SAH Subteam also met with members of the employee safety committee, without contractor management or DOE site personnel present.

Employee anonymity was maintained by not documenting the names of employees that were interviewed or that interacted with us during our investigation. Working level employees from the production, maintenance, workover rig, field support, gas plant, and water facility organizations were interviewed. These organizations represent approximately 90 percent of the working level employees.

From these interviews, interactions, and observations, conclusions on employee perceptions were built and verified between the organization’s elements.

References

The following JBEC policies and procedures were reviewed prior to the interviews and interactions to assist in understanding the health and safety program and safety culture at NPR-3:

1.3-02 Organizational Safety Responsibilities, Rev. 3, 92/06/11
1.3-04 Accident, Incident, and Near Miss Reporting, Rev. 2, 92/06/08
1.3-08 Safety Meetings, Rev. 3, 92/03/30
1.3-10 Safety Awards, Rev. 4, 92/03/30
1.3-18 Safety Inspections: General Requirements, Rev. 2, 92/06/08
1.3-40 Safety and Health Department Tracking Program, 92/06/11

Discussion

A. The consensus of the working level employees that this reviewer interviewed or interacted with stated that NPR-3 is a safe place to work. At no time did any employee state that NPR-3 was an unsafe place to work. As a point of fact, several employees stated that NPR-3 is safer than most similar oil field operations that they were aware of; and that, furthermore, they had never worked in a similar operation that was more safe.

B. The consensus of the working level employees that this reviewer interviewed or interacted with, however, stated that health and safety noncompliance and/or safety concerns do exist at NPR-3. These employees stated that they were aware the JBEC, as part of the general health and safety program, has proceduralized components which allow for the identification of noncompliance items and/or safety concerns by supervisors, their designee or individual working level employees. However, these employees stated that the rationale or methodology to determine the acceptability (selection) of these noncompliance items and/or safety concerns for correction; the order (timing) and manner (method) these noncompliance and/or safety concerns are corrected; and the routine status feedback on these noncompliance and/or safety concerns to the individual working level employee is lacking and should be improved.

These employees also stated that they were not aware of any formalized provisions for appeal within JBEC if an individual employee disagrees with the selection, timing, and manner of correction of noncompliance items and/or safety concerns.

C. The consensus of the working level employees that this reviewer interviewed or interacted with stated that they could refuse to do a task if they surmised that task was unsafe. Several employees related instances in which they had refused and the problem was then fixed.

D. The consensus of the working level employees that this reviewer interviewed or interacted with stated that the recently created Field Safety Representative Committee should be formalized by JBEC policy and procedure. Furthermore, this committee should meet on a monthly basis to solicit working level employee safety concerns. In addition to the committee’s formalization and monthly meetings, the employees stated that a more refined system of tracking be initiated that would provide...
the initiating working level employee with feedback on the selection, timing, and manner of correction of their individual noncompliance and/or safety concerns.

E. Lastly, a smaller number of working level employees stated that some ambiguity exists regarding their understanding of the safety award program--particularly the quarterly safety awards.

Gary Lietz  
July 15, 1992