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Environment, Safety, and Health
Washington, DC 20585

Tiger Team Assessment
Energy Technology Engineering Center

APRIL 1991

PREFACE

This report documents the Tiger Team Assessment of the Energy Technology Engineering Center (ETEC), located in southeastern Ventura County, California. ETEC is operated for the Department of Energy (DOE) by the Rocketdyne Division of Rockwell International Corporation. The assessment was conducted from March 18 to April 16, 1991, under the auspices of DOE's Office of Special Projects under the Assistant Secretary for Environment, Safety and Health (ES&H).

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

The content of the draft report was reviewed for factual accuracy by representatives of DOE's Office of the Assistant Secretary for Nuclear Energy; the Office of Environmental Restoration and Waste Management; the San Francisco Operations Office (SAN); Rockwell; and Federal, State, and local regulatory agencies. This final report reflects the factual changes from that review.

The ETEC 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 (Retired), 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.

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GLOSSARY of ACRONYMS

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A&C	Actions and Commitments
ACAHE	Atmospheric (Fluidized Bed) Combustion Air Heater Experiment
ADM	Action Description Memorandum
ADS	Activity Data Sheet
AIP	Approval in Principle
*ALARA	As Low as Reasonably Achievable
*ANS	American Nuclear Society
*ANSI	American National Standards Institute
*ASME	American Society of Mechanical Engineers
ASNE	Assistant Secretary for Nuclear Energy
ASNT	American Society of Nondestructive Testing
ATP	Acceptance Test Procedure
AWS	American Welding Society
HWSA	Hazardous Waste Storage Area
BMP	Best Management Practice
BMPF	Best Management Practice Finding
CAC	California Administration Code
CAM	Continuous Air Monitor
CAP	Corrective Action Procedure
*CEQ	Council on Environmental Quality
*CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CF	Compliance Finding
*CFR	Code of Federal Regulations
CHCF	Component Handling and Cleaning Facility
CHSC	California Health and Safety Code
CPAF	Cost Plus Award Fee
CREDO	Centralized Reliability Data Organization
CRIS	Calibration Recall and Inventory System
COTR	Contracting Offices Technical Representative
CSR	Construction Squawk Report
CWA	Clean Water Act
CWP	Controlled Work Permit
*CX	Categorical Exclusion
*D&D	Decontamination and Decommissioning
DCR	Document Change Request
DHS	Department of Health Services
DNAPL	Dense Non-Agueous Phase Liquid
*DOE	Department of Energy
DOELAP	Department of Energy Laboratory Accreditation Program
DOHS	California Department of Health and Safety
DWTSG	Double Wall Tube Steam Generator
EA	Environmental Assessment
EAL	Emergency Action Level
EAP	Employee Assistance Program

*Indicates acronyms or abbreviations not defined or spelled out after the first usage in the body of the report.

ECM	Energy Conservation Measure
ECRO	Equipment Clearance and Release Order
*EH	DOE Office of Environment, Safety and Health
EIS	Environmental Impact Statement
*EM	DOE Office of Environmental Restoration and Waste Management Monitoring
EOC	Emergency Operations Center
*EPA	Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-know Act
EPIP	Emergency Plan Implementing Procedure
EPIP	Environmental Protection Implementation Plan
*ER	DOE Office of Energy Research
*ES&H	Environment, Safety and Health
*ETEC	Energy Technology Engineering Center
EWR	Engineering Work Request
FFA	Federal Facility Agreement
FFCTP	DOE Office of Facilities, Fuel Cycle, and Test Programs
FFTF	Fast Flux Test Facility
FHPU	Flash Hydropyrolysis Unit
FIFRA	Federal Insectide, Fungicide, and Rodenticide Act
FR	Federal Register
FSCP	Facility Spill Contingency Plan
FONSI	Finding of No Significant Impact
FWP	Field Work Proposal
*FY	Fiscal Year
GFCI	Ground Fault Circuit Interrupted
GOCO	Government-Owned, Contractor-Operated
GPP	General Plant Project
HAR	Hydrogeologic Assessment Report
HAZMAT	Hazardous Material
HEPA	High-Efficiency Particulate Air (Filter)
HS&E	Health, Safety and Environment (Department)
IHEM	In-House Energy Management
INEL	Idaho National Engineering Laboratory
*INPO	Institute of Nuclear Power Operations
IS	Instrumentation and Standards
ISRS	Independent Safety Review System
LDR	Land Disposal Restricted
LMDL-1	Liquid Metal Development Laboratory-1
LMDL-2	Liquid Metal Development Laboratory-2
MD	Management Directive
MEP	Master Emergency Plan
MOU	Memorandum of Understanding
MPC	Maximum Permissable Concentration

*Indicates acronyms or abbreviations not defined or spelled out after the first usage in the body of the report.

MSDS	Material Safety Data Sheet
MTF	Memorandum-to-File
NCO	NEPA Compliance Officer
NCP	National Contingency Plan
*NCR	NonConformance Report
NDE	Nondestructive Examination
*NE	DOE Office of Nuclear Energy
*NEPA	National Environmental Policy Act
NESHAP	National Environmental Policy Act for Hazardous Air Pollutants
*NFPA	National Fire Protection Association
NIST	National Institute of Standards and Technology
*NPDES	National Pollutant Discharge Elimination System
*NPL	National Priority List
*NQA-1	Nuclear Quality Assurance Standard One
NRC	Nuclear Regulatory Commission
NSF	National Science Foundation
ODWR	Operations Department Work Request
OIIO	SAN Office of Internal Independent Oversight
OR	Occurrence Report
ORNL	Oak Ridge National Laboratory
ORR	Operational Readiness Review
*OSA	DOE Office of Safety Appraisals
*OSHA	Occupational Safety and Health Administration
OSR	Operational Safety Requirement
OWR	Operations Work Request
PCB	Polycholorinated Biphenyl
PDU	Process Demonstration Unit
PERT	Program Evaluation Review Technique
PIC	Person in Charge
PO	Purchase Order
PODD	Program Operations Department Directive
PSO	Program Senior Official
PSWR	Plant Services Work Request
*QA	Quality Assurance
QAP	Quality Assurance Program
*QC	Quality Control
QV	Quality Verification
*RCRA	Resource Conservation and Recovery Act
*R&D	Research and Development
RDT	Reactor Development and Technoclogy
REIRS	Radiation Exposure Information Reporting System
RFA	Request for Authorization
RFI	RCRA Facility Investigation
RFP	Request for Proposal
RFQ	Request for Quotation
RIHL	Rockwell International Hot Laboratory
RMDF	Radioactive Material Disposal Facility

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RPIS	Real Property Information System
RWQCB	Regional Water Quality Control Board
S&H	Safety and Health (Subteam)
SABER	Steam Accumulator Blowdown Evaluation Rig
*SAN	DOE San Francisco Operations Office
*SAR	Safety Analysis Report
*SARA	Superfund Amendments and Reauthorization Act
SCAQMD	South Coast Air Quality Management District
SCTI	Sodium Component Test Installation
SEN	Secretary of Energy Notice
SFMP	Surplus Facilities Management Program
SIS	Steam Injection System
SLAC	Stanford Linear Accelorator Complex
SNAP	Space Nuclear Auxiliary Power
SNM	Special Nuclear Material
SPACE	Space Power Advanced Components Engineering (Facility)
SPCC	Spill Prevention Control and Countermeasures
SPTF	Sodium Pump Test Facility
*SSFL	Santa Susana Field Laboratory
STP	Sewage Treatment Plant
SWMU	Solid Waste Management Unit
TA	Travel Authorization
TCM	Toxic and Chemical Materials
TPCA	Toxic Pits Cleanup Act
TRU	Transuranic
TSA	Technical Safety Appraisal
TSCA	Toxic Substances Control Act
TSD	Technical Support Division
TSDF	Treatment, Storage, Disposal Facility
TTF	Thermal Transient Facility
UOR	Unusual Occurence Report
UST	Underground Storage Tank
VAPCD	Ventura Air Pollution Control District
VSI	Visual Site Inspection

*Indicates acronyms or abbreviations not defined or spelled out after the first usage in the body of the report.

EXECUTIVE SUMMARY

EXECUTIVE SUMMARY

This report documents the results of the Tiger Team Assessment of the Energy Technology Engineering Center (ETEC) and other DOE-owned facilities at the Santa Susana Field Laboratory (SSFL). The assessment was conducted from March 18 to April 12, 1991, by a team comprised of professionals from DOE, contractors, and consultants. The purpose of the assessment was to provide the Secretary of Energy with the status of environment, safety and health (ES&H), and quality assurance (QA) programs at ETEC.

ETEC's primary mission is to provide engineering development and testing of components related to liquid metals technology and to conduct applied engineering development of emerging energy technologies. During the period of the assessment, ETEC was in the process of completing pre-startup testing of the Sodium Component Test Installation (SCTI) facility for long-term operation using two new test articles; the Few Tube Test Model (FTTM) and the Double Walled Tube Steam Generator (DWTSG). Reactor operations which supported prior programs were conducted by Atomics International Division of Rockwell. These operations were phased out beginning in the mid 1960's, and all 10 reactors have been dismantled and removed from SSFL. Decontamination and decommissioning activities are included in the Environmental Restoration and Waste Management Five-Year Plan.

ETEC and the DOE San Francisco Operations Office (SAN) conducted self-assessments prior to the arrival of the Tiger Team (see Section 6.0). Each organization is in the process of institutionalizing the self-assessment program, in accordance with the memorandum issued by the Secretary of Energy on July 31, 1990.

The Tiger Team also investigated DOE activities associated with historic and current activities performed by Rockwell under contracts or grants to DOE, or its predecessor agencies, at Rockewell's Downey, Canoga Park, and DeSoto facilities.

The openness and forthrightness of SAN and the Site Contractor (the Rocketdyne Division of Rockwell International) contributed substantially to the ability of the Tiger Team to complete the assessment effectively and in reasonable time. During initial briefings and throughout the assessment, the Tiger Team was provided a candid and objective accounting of known ES&H concerns and contributing factors at the site. Many of these problems and causes were validated during the course of the assessment.

Environment

The Environmental Subteam found that environmental and waste management programs for DOE activities within Area IV of the SSFL are generally in compliance with Federal and State of California environmental regulations, but are not in compliance with many of the DOE Orders pertaining to environmental requirements. SAN and the Site Contractor are, for the most part, reacting to regulatory requirements and public pressure, as opposed to being proactive, particularly with regard to the inactive waste site remediation and groundwater characterization. SAN and the Site Contractor also have no dedicated environmental staffs addressing the environmental concerns at the facility. As a result of these limited staff resources, environmental compliance activities for DOE facilities at SSFL must compete with other priorities at SSFL.

Specifically, the Environmental Subteam identified 22 findings related to nonconformance with Federal and State of California laws and regulations, DOE Orders, and Site Contractor operating procedures, and 17 findings related to best management practices. Key environmental programmatic findings include:

- inadequate environmental monitoring,
- inadequate hydrogeologic characterization, and
- deficiencies with DOE required environmental plans and Site Contractor Standard Operating Procedures.

The more significant contributing causal factors contributing to the root causes include the lack of or inadequate operating procedures for the Site Contractor's environmental programs; inadequate training in the requirements of existing environmental laws, regulations, DOE Orders, and Site Contractor standard operating procedures; inadequate allocation of resources; and inadequate reviews and appraisals which did not formally identify many of the assessment findings.

No noteworthy practices were identified by the Environmental Subteam during the Tiger Team Assessment.

Safety and Health

Significant improvements are needed before all activities at ETEC facilities can be judged to have achieved an acceptable performance level according to the new safety culture stipulated for DOE sites. A total of 138 concerns are presented in the Safety and Health section of this appraisal report; 133 concerns are addressed to the Site Contractor and 5 are targeted specifically at SAN. Three of the concerns, two on worker safety in electrical systems, and one on personal protection, are designated Category II. A Category II concern addresses a substantial noncompliance with DOE Orders or a significant risk (but not a clear and present danger to workers or to members of the public).

Key concerns include:

- lack of formal safety programs at ETEC,
- insufficient ES&H oversight of ETEC activities,
- deficiencies in administrative controls,
- noncompliance with DOE Orders and Federal Regulations,
- insufficient SAN oversight, and
- deficiencies in maintenance administration and control.

Primary causal factors for concerns are judged to be lack of management commitment to develop and implement a proactive ES&H policy and insufficient resources dedicated to ETEC activities.

Occupational Safety and Health Administration (OSHA)

A total of 155 OSHA noncompliance issues were identified, of which 153 were designated "serious." Over half of the noncompliances were in the area of electrical safety; other significant noncompliances were reported for machine guarding, toxic substances, walking surfaces, personal protection, and materials handling.

Management and Organization

Key management findings, which are supported by the Environmental and Safety and Health Assessments, concern the lack of effective Site Contractor and DOE oversight of ES&H activities, the absence of formality and rigor in the performance and documentation of ES&H activities, and inadequacies identified in management systems. Deficiencies in training are pervasive, and organizational and individual ES&H roles, responsibilities, and authorities are not well defined or understood.

The Management Subteam identified two root causes for the findings and concerns identified in this assessment. First, the Site Contractor does not have full appreciation of the magnitude, scope, and necessary level of detail required to implement the DOE ES&H initiatives, and therefore, has not accomplished the desired cultural change; second, ES&H activities at ETEC have not been accorded sufficient priority by the DOE organizations involved in the planning, guiding, assessing, and overseeing of these activities.

The Tiger Team concluded that no curtailment or cessation of any operations at ETEC was warranted as a result of the findings and concerns in this Tiger Team Assessment. However, based upon findings and concerns identified by the Tiger Team, the Site Contractor suspended the following operations to provide an opportunity for review and improvement of work practices, construction safety, and monitoring activities:

- Construction on the scaffolding for the Kalina Plant.
- Decontamination and decommissioning activities at the Hot Laboratory, Bldg. T020, and at the Space Nuclear Auxiliary Power (SNAP), Area IV, Bldg. T059A.
- Improper waste treatment and handling activities at the Mass Spectrometer Laboratory in Bldg. 104 at Rocketdyne's DeSoto Facility.

INTRODUCTION

1.0 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 Department of Energy (DOE). One of the initiatives involved conducting independent Tiger Team Assessments at DOE operating facilities. The Office of Special Projects within the Office of Environment, Safety, and Health (EH) has the responsibility to conduct Tiger Team Assessments for the Secretary of Energy. This report presents the assessment of the buildings, facilities, and activities under the DOE/Rockwell Contract No. DE-AM03-76SF00700 for the Energy Technology Engineering Center (ETEC) and of other DOE-owned buildings and facilities at the Santa Susana Field Laboratory (SSFL) site in southeastern Ventura County, California, not covered under Contract No. DE-AM03-76SF00700, but constructed over the years under various other contracts between DOE and Rockwell International. ETEC is the twenty-first DOE site to be reviewed by a Tiger Team.

ETEC is an engineering development complex operated for DOE by the Rocketdyne Division of Rockwell International Corporation. ETEC is located within SSFL on land owned by Rockwell. The balance of the SSFL complex is owned and operated by Rocketdyne, with the exception of a 42-acre parcel owned by the National Aeronautics and Space Administration (NASA). The primary mission of ETEC is to provide engineering, testing, and development of components related to liquid metals technology and to conduct applied engineering development of emerging energy technologies. The management of ETEC operations is assigned to the DOE San Francisco Operations Office (SAN). The major DOE program office with programmatic responsibilities for ETEC is the Office of Nuclear Energy (NE). For simplicity, the term "Site Contractor" will typically be used henceforth in place of Rockwell International, of which Rocketdyne is an operating division, to mean the organizational entity responsible for the operation and conduct of DOE buildings, facilities, and activities at SSFL.

1.1 PURPOSE

The purpose of the ETEC 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 and site contractor ES&H management programs.
- 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 ETEC 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 of California, and local regulations, requirements, permits, agreements, and enforcement actions.
- Compliance with DOE Order requirements for ES&H activities.
- Compliance with the Occupational Safety and Health Administration (OSHA) regulations and standards.
- Adequacy of DOE and ETEC 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 noteworthy practices.

1.3 APPROACH

The Tiger Team Assessment at ETEC 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. The assessment was conducted by a team of specialists from various DOE offices and support contractors. The Tiger Team was managed by a senior DOE official, a Deputy Team Leader, 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.

Each Subteam focused on major facilities, operations, and systems to conduct a comprehensive evaluation that was representative of the overall status of ETEC ES&H programs. The Environmental Subteam performed an assessment of all applicable elements of ETEC environmental systems. Environmental issues of a management nature were referred to the Management Subteam for followup. An evaluation of the adequacy of ETEC occupational safety and industrial safety programs was conducted by the Safety and Health Subteam. This Subteam conducted a comprehensive, multidisciplined Technical Safety Appraisal (TSA) following protocols for these appraisals. The TSAs are operationally focused evaluations; as such, they appraise how safely a facility or site is being operated and the condition of equipment. To ensure consistency, the causal factors identified by all the Subteams and during the management evaluation of the ES&H program are considered by the Management Subteam in the identification of probable root causes.

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 planning, onsite activities, reporting, and corrective action planning.

1.3.1 Pre-Assessment Planning

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

The pre-assessment site visit was conducted by the Tiger Team Leader; the Deputy Tiger Team Leader; the Environmental, Safety and Health, and Management Subteam Leaders; and representatives from EH, the Office of Special Projects, and the NE Program Office on February 20 and 21, 1991. The Manager of SAN and Rockwell managers involved with ETEC activities provided overviews of site operations and ES&H programs. The Tiger Team Leader, Deputy Tiger Team Leader, and Subteam Leaders discussed the Tiger Team Assessment program and necessary support requirements for the onsite assessment. Federal, State of California, and local regulators attended the pre-assessment activity.

1.3.2 Onsite Activities

Onsite activities for the assessment took place from March 18 through April 12, 1991. 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 DOE, Site Contractor, and site subcontractor personnel, as well as personnel from Federal, State of California, and local regulatory agencies. In addition, the Tiger Team met with representatives of the SSFL Work Group to gain an understanding of their concerns regarding DOE activities on the SSFL. A number of the concerns identified by the SSFL Work Group were incorporated, to the extent possible, into the Tiger Team Assessment, while others were determined to be outside the scope of the assessment.

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

The Tiger Team process was conducted in an open manner for DOE, Site Contractor management, and regulators in order to enhance communication with the site, and to ensure the accuracy of information and issues. During the process, all three Subteams conducted daily debriefing sessions. The daily debriefing sessions were well attended, and NE, SAN, and site personnel actively participated in the sessions. In addition, the Tiger Team Leader held daily meetings with senior managers from SAN and with Rockwell managers involved with ETEC operations 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 DOE and Rockwell personnel and conducted factual accuracy reviews.

1.3.3 Reporting

Section 2.0 is an overall summary of the key Tiger Team Assessment findings, concerns, noteworthy practices, and probable root causes identified by the discipline Subteams. Sections 3.0 through 5.0 contain the Environmental, Safety and Health, and Management findings and concerns, respectively. Section 6.0 addresses an evaluation of SAN and ETEC self-assessment programs. Section 7.0 describes several special issues which were noted during the course of the ETEC Tiger Team Assessment.

For the Environmental Subteam, identified issues are categorized as either "compliance findings (CF)," "best management practice findings (BMPF)," 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. Each finding is prefaced by a statement of an applicable performance objective. 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 and Management Subteams are not necessarily arranged in order of relative significance.

The Safety and Health Subteam employed a reporting format consistent with and integral to 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:

- reflects 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 objective of the OSHA portion of the review of ETEC facilities was to measure workplace safety and health against DOE-prescribed OSHA regulations. General Industry Standards (29 CFR 1910) and Construction Industry Standards (29 CFR 1926) were used as criteria. A full report of the OSHA assessment is presented in Appendix F.

The Management Subteam evaluated the effectiveness of management processes relative to ES&H programs to identify findings and further insights into probable root causes for ES&H 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.

In addition to identifying findings and concerns, the Subteams looked for exceptional practices in accomplishing performance objectives or meeting ES&H objectives. The purpose of identifying exceptional practices is that they may have general application to other DOE facilities.

The Tiger Team Assessment reflects a fixed point in time. Improvements in the ES&H 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 site's conditions from the onset of the assessment.

This Tiger Team report was transmitted to the Manager of SAN; Rockwell management and personnel; DOE Headquarters program senior officials; and Federal, State of California, and local regulators for technical and factual accuracy review. Upon receipt of comments, the Tiger Team prepared and issued the final report, incorporating review comments, suggested changes, and modifications, as appropriate.

1.3.4 Corrective Action Planning

SAN and Rockwell will prepare a draft action plan that addresses the findings and concerns and root causes identified by the Tiger Team Assessment. The draft action plan will be submitted by the Manager of SAN to the Assistant Secretary for Nuclear Energy and to EM-1 for submission to EH-1 for review and concurrence. The Secretary will approve the final action plan and direct its implementation.

1.4 SITE DESCRIPTION

ETEC is located on the Rockwell SSFL site in southeastern Ventura County, California, near the crest of the Simi Hills at the western border of the San Fernando Valley. The SSFL site is about 40 miles northwest of downtown Los Angeles. The entire site occupies 2,668 acres, with ETEC occupying 90 acres. (This does not include the other non-ETEC, DOE-owned facilities in SSFL but outside of Area IV.) Figure 1-1 depicts the location of ETEC within the Los Angeles area. Figure 1-2 is an aerial photograph displaying ETEC with Simi Valley in the background. Figure 1-3 shows the four areas comprising the SSFL

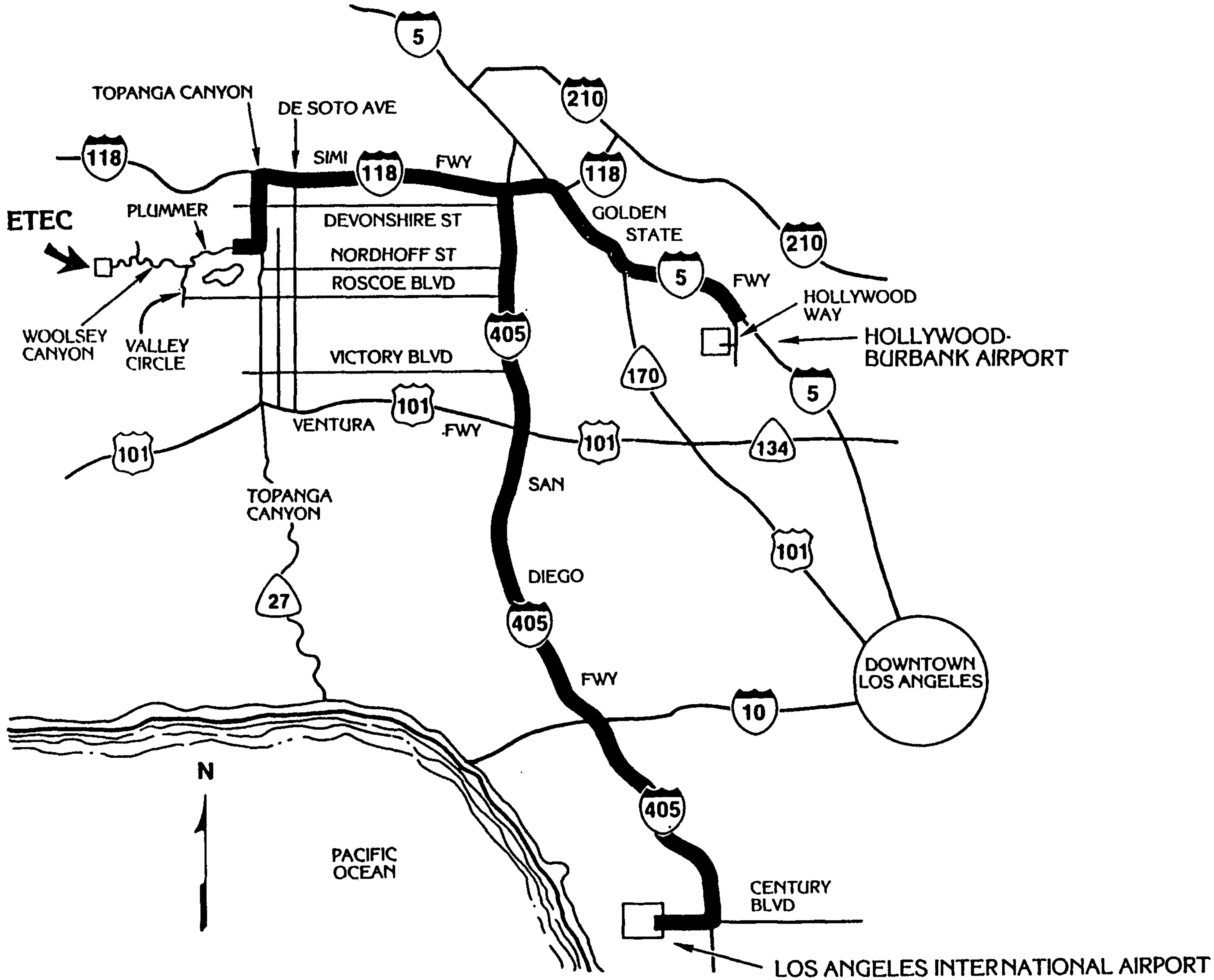


Figure 1-1. Regional Location Map of ETEC

Figure 1-2. Aerial View of ETEC

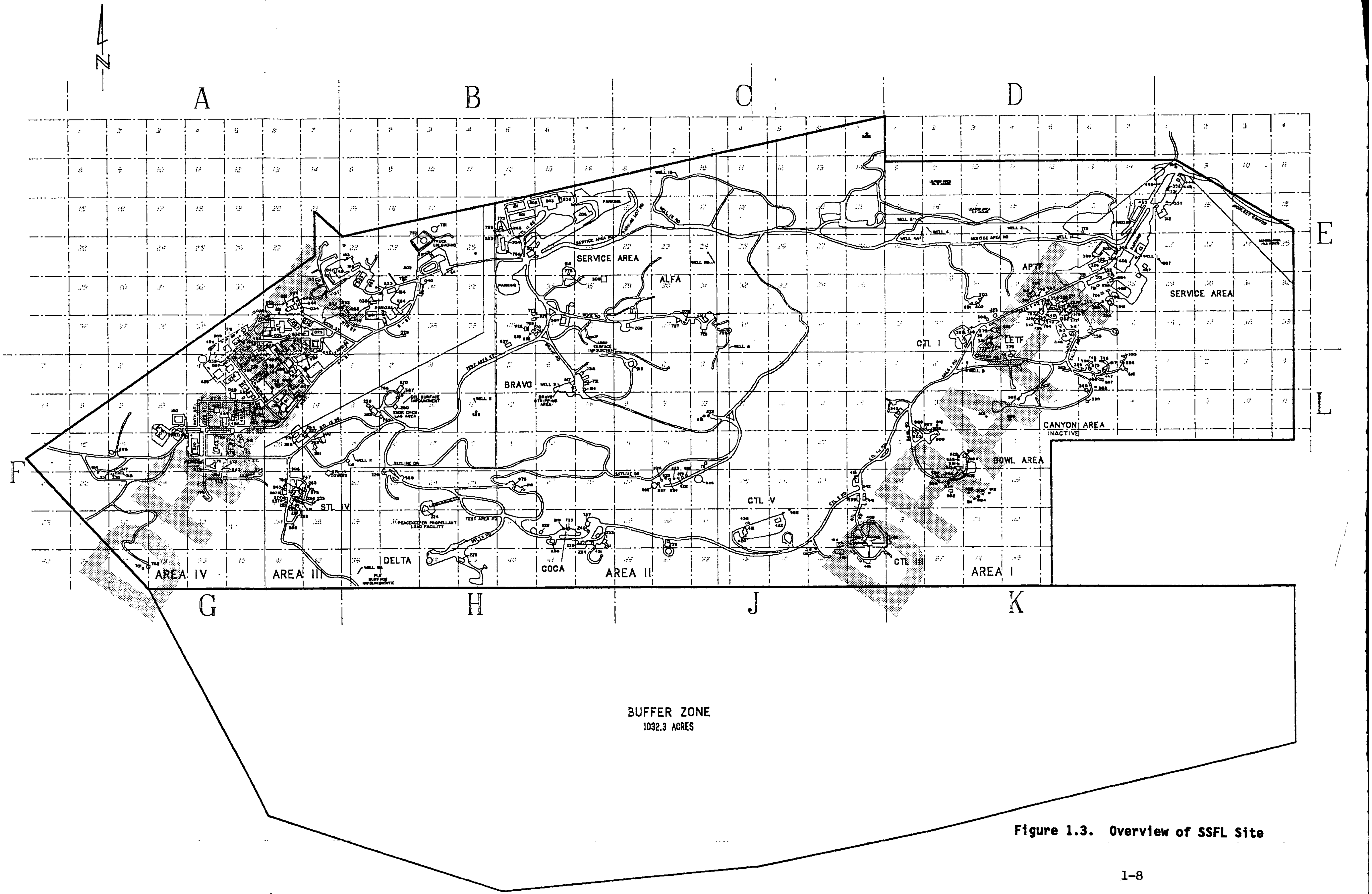


Figure 1.3. Overview of SSFL Site

site, and Figure 1-4 depicts the Area IV section, which is where almost all the DOE activities have been conducted and within which ETEC is located.

The Rocketdyne Division of Rockwell International Corporation operates ETEC for DOE. There are currently about 150 employees at ETEC and less than 1,000 employees throughout the SSFL complex. There are approximately 50 DOE-owned facilities designated as "ETEC" and approximately 16 DOE-owned facilities which are within the SSFL, but which are not covered by the DOE/Rockwell contract for ETEC. Of this total, 19 facilities are currently operating. There are also Rockwell facilities used for past and for current DOE programs at Downey, DeSoto, and Canoga Park. These facilities are addressed as special issues in Section 7.0.

In the region surrounding SSFL, the greatest population density occurs to the east of the site in the San Fernando Valley. The 23 communities in the valley had a reported population of approximately 1,618,900 in 1980. The estimated 1980 population distribution within 50 miles of the SSFL site included approximately 8,065,000 persons. About 110,000 persons are estimated to live within a 5-mile radius of the site. The closest resident lives about 1.3 miles to the south.

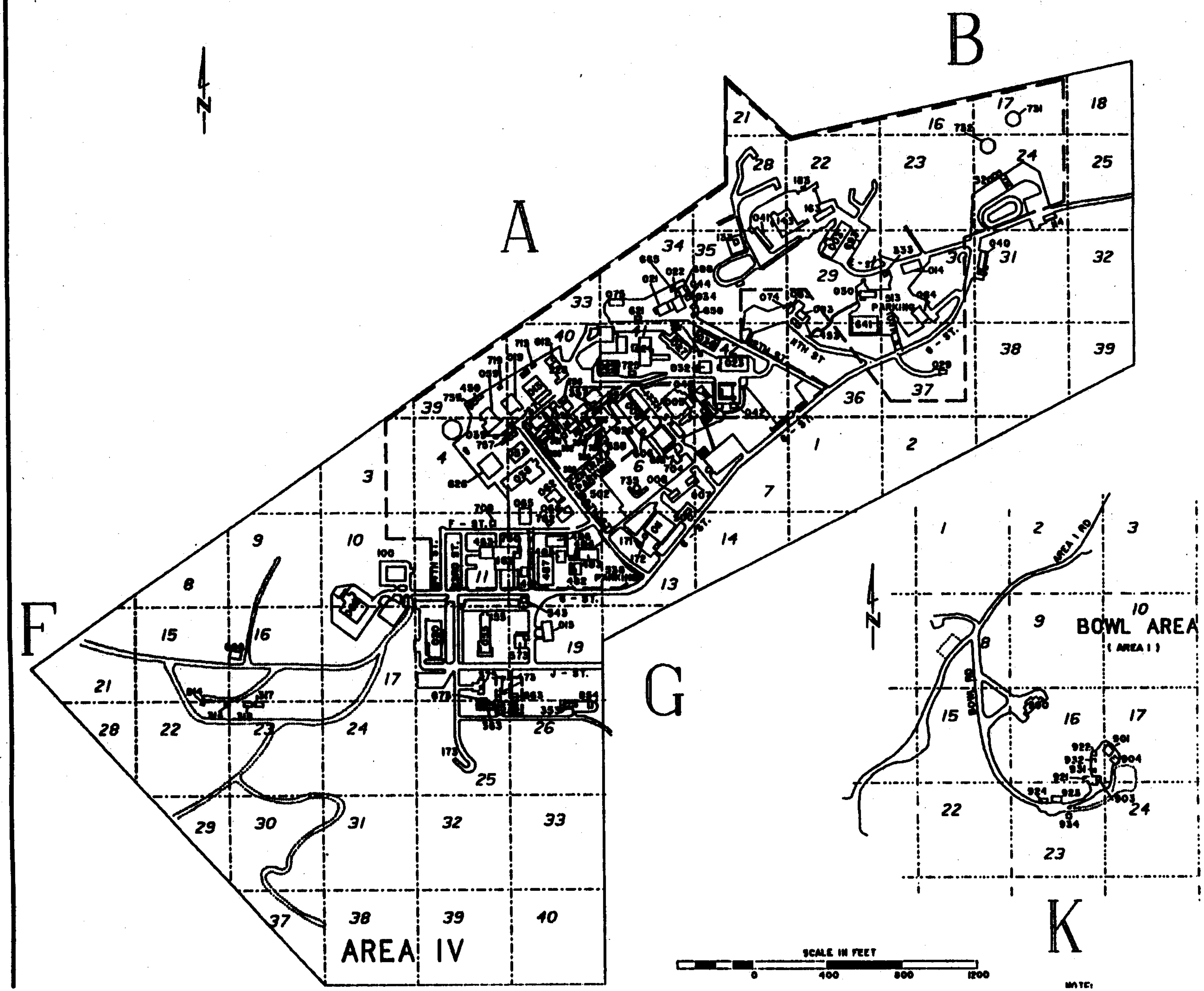
SSFL is located primarily within the Bell Creek drainage system, a tributary of the Los Angeles River. Discharge from the facility includes treated sewage effluent and surface runoff. Surface water moves via a system of drainage ditches and catch basins to two major retention ponds. The treated effluent is discharged to the retention ponds and subsequently discharges into Bell Creek. Additionally, during periods of excessive runoff, some runoff flows into the Simi Valley through normally dry channels.

The entire site is located within a seismically active region, although no earthquakes have originated along minor faults in the immediate vicinity of the site. Major active faults in the region include the San Andreas Fault, the Santa Ynez Fault, the San Gabriel Fault, and the Inglewood Fault. Four minor (approximately 3.3 Richter) earthquakes and 5 major (greater than 6.0 Richter) earthquakes have been recorded along these faults within 60 miles of the site.

The site is part of the Southern California Coastal Region and the climate is typical of a semiarid region. Monthly mean temperatures range from near 50° F to the upper 70s. Weather patterns are controlled principally by the Pacific high pressure cell located off the west coast of North America. Average mean rainfall is 17.4 inches, with 95 percent of the total annual accumulation occurring between November and April.

Local relief at the site is approximately 600 feet. Unconsolidated surficial material generally consists of a 10- to 30-foot deposit of alluvium. Beneath the alluvium is the Chatsworth formation, an undifferentiated, well-cemented sandstone containing occasional thin beds of shale. Faults and fractures are common within the Chatsworth formation and are characteristic of the tectonic activity which produced the Simi Hills. Groundwater movement is controlled by the geologic conditions of the Chatsworth formation and water generally occurs along fault plains, fractures, and joints within the formation.

Figure 1-4. SANTA SUSANA FIELD LABORATORY AREA IV



1.5 OVERVIEW OF MAJOR SSFL/ETEC OPERATIONS

Rockwell International Corporation, and its predecessor organizations, have conducted programs for DOE (formerly the Atomic Energy Commission and later the Energy Research and Development Administration) at SSFL since the early 1950s. The early programs included engineering, research and development, and manufacturing functions primarily concerned with nuclear reactor development and applications.

In 1966, ETEC was chartered to provide engineering development and testing of components for the Liquid Metal Fast Breeder Reactor Program. The ETEC complex contains the world's largest facilities for testing liquid metal steam generators and pumps, a unique facility for testing the effects of enduring severe thermal transients on various types of power plant components, a unique seismic facility with the capability to cause failures in full-size piping systems, and several multi-purpose test facilities.

ETEC conducts programs for DOE and, with DOE's approval, for other organizations. Although liquid metal technology constitutes the majority of the activities, alternative programs take advantage of the expertise and facilities in energy development areas and have included programs in solar, fossil, geothermal, conservation, fission, and fusion. These activities have been conducted for the Nuclear Regulatory Commission (NRC), Department of Defense (DOD), Western Area Power Administration, Bonneville Power Administration, DOE National Laboratories and Engineering Centers, and private corporations that are primarily government contractors.

KEY FINDINGS, ROOT CAUSES, AND NOTEWORTHY PRACTICES

2.0 KEY FINDINGS, ROOT CAUSES, AND NOTEWORTHY PRACTICES

2.1 ENVIRONMENTAL

2.1.1 Key Findings

The Environmental Subteam identified 39 findings in this assessment of DOE activities within Area IV of the SSFL. None of the findings reflect situations that present an immediate risk to public health and the environment. Twenty-two findings reflect problems that do not meet the requirements of Federal or State of California laws and regulations, DOE Order requirements, or Site Contractor standard operating procedures. Seventeen findings represent conditions in which best management practices (BMPs) are not employed. From these findings, the Environmental Subteam identified the following three key programmatic finding groupings:

- **Inadequate Environmental Monitoring** - Although sitewide radioactive air emissions are well below established standards, deficiencies with the radioactive stack and ambient air monitoring systems were identified (see Section 3.5.1.2, Finding Air/CF-2, and Section 3.5.1.3, Finding Air/BMPF-1). Additionally, there is no intermittent stream sediment monitoring (see Section 3.5.2.3, Finding SSB/BMPF-2) and there is inadequate stormwater monitoring (see Section 3.5.2.3, Finding SSB/BMPF-2) and groundwater monitoring (see Section 3.5.4.3, Finding GW/BMPF-1) to assess onsite and offsite contaminant migration.

- **Inadequate Hydrogeologic Characterization** - Physical hydrogeologic parameters such as flow direction, velocity, and gradient have not been adequately established; and chemical contaminant lateral and vertical distribution, and retardation within the vadose zone, have not been assessed (see Section 3.5.4.3, Finding GW/BMPF-1).

- **Deficiencies with DOE Required Environmental Plans and Site Contractor Environmental Standard Operating Procedures** - The Site Contractor has not prepared, or has inadequately prepared, numerous environmental plans as required by DOE Orders, and standard operating procedures necessary for reliable environmental compliance (see Sections 3.5.1 through 3.5.10, nearly all findings).

No noteworthy practices were identified by the Environmental Subteam during the course of the Tiger Team Assessment.

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. SAN, Site Office, and the Site Contractor are expected to develop and implement corrective actions for individual causal factors *identified in each finding.*

A total of eight causal factors were identified as contributing to the occurrence of the Environmental Subteam findings. In most instances, more than one causal factor is identified for each finding. A summary of individual causal factors identified for each finding is presented in Table 2-1. Each of these causal factors is defined in Appendix G. The five causal factors that appeared most frequently are: procedures, appraisals/reviews, training, resources, and quality assurance/control. A discussion of the five causal factors follows. These factors have been highlighted for ease of identification.

- **Procedures** appeared as a causal factor in 72 percent of the Environmental Subteam findings. In these findings, standard operating procedures needed to ensure implementation of policies and standards, were either absent, incomplete, or informal. Procedures, as a causal factor, were especially prevalent in findings dealing with environmental monitoring and NEPA compliance. Additionally, lack of, or inadequate procedures to conduct training or periodic retraining was frequently identified as a causal factor.

- **Appraisals/Reviews** appeared as a causal factor in 64 percent of the Environmental Subteam findings. In these findings, a lack of adequate appraisals and reviews by SAN, the Site Office, and the Site Contractor contributed to deficiencies not being detected and corrected. Appraisals/Reviews was frequently identified in conjunction with the procedures causal factor, in that procedural deficiencies were not subject to appropriate appraisals and reviews.

- **Training** appeared as a causal factor in 49 percent of the Environmental Subteam findings. SAN, Site Office, and Site Contractor employees had not had sufficient training to understand and implement elements of their assigned responsibilities.

- **Resources** appeared as a causal factor in 26 percent of the Environmental Subteam findings. In these findings, resources were not adequately allocated, or there was a lack of available resources, to address previously identified deficiencies. Inadequate resources or resource allocation was identified as a primary causal factor for findings involving groundwater monitoring, characterization, and protection. Additionally, lack of resources was identified as a causal factor in most of the findings involving development of environmental programs and plans.

- **Quality Assurance/Control** appeared as a causal factor in 18 percent of the Environmental Subteam findings. In these finding, inadequate quality assurance/control on the part of SAN, the Site Office, or the Site Contractor prevented resolution of previously identified deficiencies.

TABLE 2-1
SUMMARY OF APPARENT CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING

FINDING NUMBER/TITLE		Root Causes		Causal Factors								
		Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Appraisals/Reviews	Human Factors	Quality Assurance/Control	Barriers and Controls
AIR												
A/CF-1	Inadequate Stack Emissions Monitoring Methods for Radioactive Particulates		✓	✓			✓		✓			
A/CF-2	Inadequate Meteorological Data		✓	✓	✓		✓					
A/BMPF-1	Inadequate Characterization of Ambient Levels of Radioactive Particulates		✓	✓	✓		✓		✓			
SOIL/SEDIMENT/BIOTA												
SSB/BMPF-1	Inadequate Physical Control of the Former Sodium Disposal Facility		✓						✓			✓
SSB/BMPF-2	Inadequate Stormwater and Sediment Characterization From the Northwest Area		✓	✓					✓			
SURFACE WATER												
SW/BMPF-1	Inadequate Secondary Containment Practices and Procedures		✓	✓		✓			✓			
SW/BMPF-2	Inadequacies in the Rockwell SPCC Plan and FSCP		✓	✓			✓		✓			
SW/BMPF-3	Inadequate Drinking Water Monitoring		✓	✓					✓			
SW/BMPF-4	Inadequate Preventive Maintenance Program For Sanitary Sewers		✓	✓					✓			
GROUNDWATER												
GW/CF-1	Lack of a Groundwater Protection Management Plan and a Groundwater Monitoring Plan		✓			✓						

TABLE 2-1
SUMMARY OF APPARENT CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING

FINDING NUMBER/TITLE		Root Causes		Causal Factors								
		Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Appraisals/Reviews	Human Factors	Quality Assurance/Control	Barriers and Controls
GW/CF-2	Incomplete Hydrogeologic Assessment Report (HAR) for B-886		✓			✓			✓			
GW/BMPF-1	Inadequate Characterization of Hydrogeologic Regime		✓		✓	✓						
GW/BMPF-2	Inadequate Monitoring Well Security, Maintenance, Labeling, Inventory, Abandonment, and Construction		✓	✓			✓		✓			
GW/BMPF-3	Incomplete Decontamination of Groundwater Sampling Equipment		✓	✓		✓	✓		✓			
GW/BMPF-4	No Organic Vapor Monitoring During Groundwater Sampling		✓						✓	✓		
WASTE MANAGEMENT												
WM/CF-1	Inadequate Waste Minimization Program		✓	✓			✓					
WM/CF-2	Storage of Land Disposal Restricted (LDR) Mixed Waste		✓									✓
WM/BMPF-1	Inadequate Hazardous Waste Verification		✓	✓			✓					
WM/BMPF-2	Lack of Characterization of Sanitary Wastewater Treatment Plant Sludge		✓	✓					✓		✓	

TABLE 2-1
SUMMARY OF APPARENT CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING

FINDING NUMBER/TITLE		Root Causes		Causal Factors								
		Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Appraisals/Reviews	Human Factors	Quality Assurance/Control	Barriers and Controls
TOXIC AND CHEMICAL SUBSTANCES												
TCM/CF-1	Incomplete Hazard Identification		✓				✓		✓		✓	
TCM/BMPF-1	Storage of Incompatible Chemicals		✓	✓			✓				✓	
QUALITY ASSURANCE												
QA/CF-1	Deficient Quality Control Of Vendor Analytical Laboratories		✓	✓			✓		✓			
QA/CF-2	Conflict of Interest Between Site Contractor QA/QC Coordinator and Environmental Analytical Lab Manager		✓	✓					✓			
QA/CF-3	Handling of Corrections to Data and Records Archiving		✓	✓			✓		✓			
QA/CF-4	Lack of a Formal Pollution Prevention Awareness Program Plan		✓			✓			✓			
QA/BMPF-1	Inadequate Environmental Monitoring Program											
QA/BMPF-2	Environmental Protection Implementation Plan Approval		✓						✓		✓	
RADIATION												
RAD/CF-1	AIRDOS-PC Modeling Deficiencies		✓						✓	✓		

TABLE 2-1
SUMMARY OF APPARENT CAUSAL FACTORS IDENTIFIED BY AUDIT FINDING

FINDING NUMBER/TITLE		Root Causes		Causal Factors								
		Policy	Policy Implementation	Procedures	Personnel	Resources	Training	Change	Appraisals/Reviews	Human Factors	Quality Assurance/Control	Barriers and Controls
RAD/CF-2	Lack of Supporting Data to Modify Routine Environmental Surveillance		✓	✓			✓				✓	
RAD/CF-3	No Contingency Plan for Transuranic Waste Storage		✓	✓					✓			
RAD/BMPF-1	No Consistent Contamination Surveys on Packages			✓								
INACTIVE WASTE SITES												
IWS/CF-1	Inadequate Inactive Waste Site Corrective Action		✓	✓		✓	✓		✓			
IWS/CF-2	Hazardous Materials Business Plan Reporting Inadequacies		✓	✓			✓				✓	
IWS/CF-3	Incomplete Internal Reporting Procedure		✓	✓			✓		✓			
NATIONAL ENVIRONMENTAL POLICY ACT												
NEPA/CF-1	Lack of Adequate and Integrated NEPA Procedures	✓				✓				✓		
NEPA/CF-2	Inadequate NEPA Reviews and Milestones for the Budget Review Process		✓	✓			✓		✓			
NEPA/CF-3	Lacking and Inappropriate NEPA Determinations		✓	✓			✓		✓			
NEPA/CF-4	Incomplete NEPA Recordkeeping and Tracking	✓		✓		✓	✓					
NEPA/CF-5	Inadequate NEPA Review of Proposed Actions		✓	✓								
TOTALS		2	37	28	3	10	19	0	25	3	7	2

2.2 SAFETY AND HEALTH

2.2.1 Key Concerns

A total of 138 concerns derived from the Safety and Health Subteam appraisal. These concerns were distributed in all technical areas examined except for Experimental Activities and Packaging and Transportation, and five were targeted specifically at SAN. The most significant concerns, on the basis of hazard potential and noncompliance with DOE requirements, were in the areas of Organization and Administration, Quality Verification, Operations, Maintenance, Personnel Protection, and Worker Safety.

Three Category II concerns were identified, two in the area of Worker Safety and one in Personnel Protection. The first of these two concerns related to electrical hazards that presented a serious danger to employees. The first Worker Safety concern was based upon observations of specific equipment situations that were judged to have hazard potential to employees in case of contact with the equipment; the second cited potentially dangerous practices that did not comply with 29 CFR 1910, Subpart S, electrical safety. The third Category II concern related to management's inability to enforce health and safety requirements.

Key concerns were determined from the individually reported concerns on the basis of the seriousness of their impact upon the safety of ETEC activities. The key concerns are as follows:

- **No formal safety program has been articulated and implemented by ETEC management.** ETEC management has not been proactive in meeting DOE safety requirements or in defining the safety responsibilities specific to each organizational position. Safety meetings are not held routinely, and management does not establish safety goals. No formal measures are in place to identify, evaluate, monitor, and control credible exposures to chemical, physical, or safety hazards.

- **ES&H oversight of ETEC activities does not meet minimum DOE requirements.** The formal ES&H independent appraisal system required by DOE 5482.1B, Section 9.d is not established. Although the Rocketdyne Health, Safety, and Environment Department has been assigned the responsibility, it is not providing the necessary oversight and technical support to ensure line management implementation of health and safety requirements. Moreover, ETEC management has not clearly articulated to all ETEC personnel the distinction between line safety assurance and independent safety overview.

- **The system of administrative control documents is deficient.** The content and format of approved and draft ETEC Safety Analysis Reports and Safety Analysis Documents do not comply fully with the requirements of SAN MD 5481.1A. No approved Operational Safety Requirements are in place for ETEC facility operations. ETEC has not developed an integrated QA plan that meets DOE and SAN requirements, and quality audits at ETEC do not evaluate the effectiveness of program implementation. No requirement exists for periodic review and update of procedures; furthermore, those in use are not always technically correct, and often do not provide the level of detail needed to direct personnel in the correct completion of work.

- **There is widespread noncompliance with DOE Orders, Federal regulations, and other safety and health requirements.** As cited above, the internal appraisal system does not comply with DOE 5482.1B. ETEC is not in compliance with numerous Federal regulations on worker safety; e.g., 29 CFR 1910 (exposure to noise, lead, benzene, arsenic, etc.), 29 CFR 1926.58 (exposure to asbestos), 29 CFR 1910, Subpart O (machine guarding), and 29 CFR 1910, Subpart S (electrical safety). In addition, the ETEC radiological protection program does not meet the requirements of DOE 5480.11, and the ETEC emergency preparedness program is not in compliance with several of the DOE 5500 series Orders.

- **SAN oversight of ETEC activities has been deficient in providing guidance to guarantee operational assurance of safety.** SAN has not conducted annual emergency preparedness appraisals for ETEC and has not provided guidance to ETEC on emergency preparedness functions, as required by DOE 5500.1A. Similarly, SAN does not audit the ETEC radiological program for compliance with DOE 5480.11. ETEC facility maintenance activities are currently being conducted without the input from SAN that is required by DOE 4330.4. Also, SAN has not performed the audits on firearms safety required by DOE 5480.16.

- **Maintenance administration and control on the ETEC site have serious deficiencies.** The overall ETEC maintenance program and organizational structure, including the relationship with Rocketdyne Plant Services, is not defined or understood. There is no documented ETEC maintenance plan, as required by DOE 4330.4. The maintenance program provided for both active and inactive facilities has not been effective in preventing deterioration of these facilities. The periodic inspections and corrective maintenance of inactive facilities have not precluded the development of hazardous conditions.

No noteworthy practices were identified by the Safety and Health Subteam during the course of the Tiger Team Assessment.

2.2.2 Causal Factors

The Safety and Health Subteam made an effort to identify the causes that contributed most directly to each finding. By establishing trends among these causal factors, DOE can formulate root causes. These causal factors have been highlighted for ease of identification and are noted below.

- **Management has not effectively developed ES&H policy and procedures for ETEC operations.** ES&H requirements are not effectively communicated through policy and procedures to ETEC line personnel. Many important job tasks with safety or hazard potential are performed without controls or procedures. Without adequate procedures, ETEC personnel function without an awareness of specific ES&H or technical job requirements. Several examples of employees working without knowledge of technical or ES&H requirements were noted during this assessment. Some resulted in workers being placed in hazardous or dangerous circumstances.

- **Procedures that do exist are not controlled to ensure their relevance to and validity for their stated purpose.** Some procedures contradict other procedures, resulting in confusion when employees try to implement them. Some procedures are technically incorrect or do not include important ES&H requirements. Procedure revisions are not controlled in accordance with established policy, and status of controlled documents is not verified.

- **Even when policies and procedures do exist, management does not demonstrate commitment to their implementation.** Management has not ensured a "safety first" policy in ETEC operations. ETEC personnel perform and make decisions based on schedule or convenience rather than procedure and safety. Symptoms of this root cause include the widespread use of extension wiring as permanent, the longstanding existence of known but uncorrected hazards, numerous examples of noncompliance with OSHA, DOE, and ETEC requirements, and an attitude that DOE and OSHA requirements are details that have very little relevance to site performance.

- **ETEC management does not demonstrate an active interest in identifying and correcting ES&H issues.** Substantive programs are not in place to review and identify trends in maintenance, operations, radiation safety, and engineering. Without review, trending, or other effective feedback on performance, management cannot ensure timely correction of ES&H problems. The willingness to coexist with deficient conditions was identified in the ETEC Self-Assessment. This willingness still exists, as this assessment amply verified.

- **Insufficient resources have been designated to support operation of the ETEC site in conformance with DOE and ES&H commitments.** The reduction in site activity combined with the reduction in DOE funding have brought about a commensurate reduction in site work force and resource availability. Diminished resources are available for maintenance, emergency response, training, and quality verification. Each of these four areas was determined to be significantly deficient during this assessment, and worse now than in the past. Each area also supports accomplishment of ES&H objectives; the ability to provide an acceptable margin of safety to meet ES&H requirements has eroded with time.

2.3 MANAGEMENT

2.3.1 Key Findings

A total of 12 findings were identified by the Management Subteam. These findings were distilled into the following four key findings which address the most significant management issues affecting the Site Contractor's ES&H performance:

- **The Site Contractor has not established an effective program for oversight of its ES&H activities.** The oversight conducted by the Site Contractor lacks elements of organizational independence and fails to include required appraisals. In addition, an effective performance monitoring and assessment system, which includes tracking, trending, root cause analysis, lessons learned, prioritization, corrective action, and closure of ES&H matters, is not in place.

- **ES&H activities at ETEC are not being performed with the degree of formality and rigor necessary to meet DOE policies, requirements and guidelines for the operation of DOE facilities.** Numerous problems exist related to procedure inadequacies, procedure adherence, and the procedure change process. Controls over work activities and plant configuration are often informal and inadequately documented.

- **Site Contractor organizational and individual ES&H roles, responsibilities, and authorities have not been defined, communicated, or understood throughout all levels of the organization.** There is a lack of definition and formality in assignments of responsibility and authority between line, ES&H oversight, and support organizations. Organizational goals and objectives have not been translated into individual goals and objectives. Job descriptions and employee performance evaluations do not generally consider ES&H elements.

- **DOE's oversight and guidance of ES&H activities at ETEC is not sufficient to ensure full implementation of DOE's ES&H initiatives.** NE has not conducted comprehensive ES&H oversight assessments in many years; EM has not formalized its relationship with SAN through a Memorandum of Understanding (MOU); and SAN has not been conducting required functional and management appraisals of the Site Contractor. None of these DOE organizations are providing the Site Contractor with timely site-specific guidance regarding implementation of ES&H activities. Furthermore, ES&H evaluations, made by DOE as part of the cost plus award fee (CPAF) process, have not generally reflected the Site Contractor's actual performance. While the reestablishment of the ETEC Site Office may be beneficial, that office has not been vested with either the responsibility or the authority to carry out the Secretary's mandated oversight activities.

2.3.2 Probable Root Causes

The Management Subteam attempted to identify the causes which contributed most directly to the findings and concerns identified in this Tiger Team Assessment. The most probable root causes are the following:

- **ES&H activities at ETEC have not been accorded sufficient priority by the DOE organizations involved in the planning, guiding, assessing and overseeing of these activities.** The ETEC site represents a relatively small part of the missions of NE, EM, and SAN. At SAN it competes for limited ES&H resources and management attention with other SAN sites and programs, which have been viewed as having more immediate or visible problems. Curtailment of programs at ETEC, coupled with declining budgets and the perception of low risk operations, have combined to place the Site Contractor at a distinct disadvantage in receiving from DOE the kind of guidance, resources, and oversight necessary to bring ETEC into full compliance with DOE's ES&H requirements. Recent actions by NE (formalization of an MOU with SAN) and SAN (reestablishment of the Site Office) have signaled some willingness of DOE to reverse this posture of relative inattention to ES&H concerns at ETEC.

- **Site Contractor management does not have a full appreciation of the magnitude, the scope, and the necessary level of detail, required to implement the DOE ES&H initiatives, and therefore, has not accomplished the required cultural change.** Numerous deficiencies identified by this Tiger Team Assessment evidence that cultural change has not permeated the ETEC workplace. The deficiencies found in policy implementation; the need for more formal and disciplined operations; inappropriate staff allocation, pervasive lack of training; and ineffective supervision related to ES&H activities, send strong signals regarding management's lack of understanding and appreciation of the cultural change sought.

ENVIRONMENTAL ASSESSMENT

3.0 ENVIRONMENTAL ASSESSMENT

This assessment report presents findings developed by the Environmental Subteam during the Tiger Team Assessment of the U.S. Department of Energy's (DOE) Energy Technology Engineering Center (ETEC) and other DOE facilities within the Santa Susana Field Laboratory (SSFL) in Canoga Park, California, conducted from March 18, 1991, through April 12, 1991.

ETEC and other DOE facilities are operated under DOE contract by Rocketdyne Division of Rockwell International (the Site Contractor).

3.1 PURPOSE

The purpose of the environmental assessment is to provide the Secretary of Energy with information on the current environmental regulatory compliance status and associated vulnerabilities, root causes for noncompliance, adequacy of DOE and the Site Contractor environmental management programs, response actions to address the identified problem areas, and DOE-wide environmental compliance trends.

3.2 SCOPE

The scope of the environmental assessment was comprehensive, covering all environmental media and applicable Federal, state, and local regulations as well as DOE Orders and internal Site Contractor and San Francisco Operations Office (SAN) requirements. Also covered were best management practices. The environmental disciplines addressed in this assessment are air; soil, sediment and biota; surface water and drinking water; groundwater; waste management; toxic and chemical materials; radiation; quality assurance; inactive waste sites and releases; and the National Environmental Policy Act (NEPA).

3.3 APPROACH

The Environmental Subteam assessment of ETEC was conducted in accordance with the DOE Tiger Team Guidance Manual (February 1990) and followed accepted audit practices and techniques. The assessment was conducted by a team managed by a Team Leader and Assistant Team Leader from the DOE Office of Environmental Audit. The team consisted of a multidisciplinary group of technical specialists provided by a support contractor (Arthur D. Little, Inc., Cambridge, Massachusetts). The names, responsibilities, affiliations, and biographical sketches of the team members and leaders are provided in Appendix A-2. The environmental assessment consisted of planning, onsite activities, and reporting.

A log of onsite field activities was continually updated during the onsite assessment to accurately reflect the daily activities of the team and is included in Appendix B. Appendices C and D list the Contact/Interviews and Site Documents, respectively, the team used to develop its assessment findings.

The pre-assessment site visit was conducted February 20 and 21, 1991. SAN and the Site Contractor provided an overview of the following: Management of the site; and the environmental, safety, and health (ES&H) policies and programs at the site. The Tiger Team provided the Site Contractor and SAN with the scope and purpose of the Tiger Team Assessment. Federal and state regulators were invited to attend the pre-assessment site visit and to participate in subsequent assessment activities. The Tiger Team met with collective bargaining units active at ETEC, and representatives of EPA, Region IX.

The onsite activities for the environmental assessment took place from March 18, 1991 through April 12, 1991. Onsite activities included document reviews; observation of site operations; interviews with SAN and Site Contractor staff as well as personnel from the Federal, state, and local regulatory agencies; and review of previous audits, surveillance, appraisals, and assessments. The Environmental Subteam held daily debriefings to share with the site and with invited observers the issues surfaced and being developed as a result of the assessment. Finally, the Subteam developed findings and other sections of the ETEC Tiger Team Assessment Report. The findings development process included validations in the form of a formal Technical Accuracy Review with SAN and the Site Contractor.

The Environmental Subteam identified findings in two categories: compliance findings and best management practice (BMP) findings. Compliance findings represent conditions that, in the judgment of the Subteam, may not satisfy the requirements of environmental regulation, applicable DOE Orders (including internal DOE directive memoranda, where referenced), consent orders, agreements with regulatory agencies, permit conditions or Site Contractor standard operating procedures. BMP findings represent situations where, in the judgment of the Subteam, sound and generally accepted industry management practices are not being employed.

3.4 ENVIRONMENTAL ASSESSMENT SUMMARY

The Environmental Subteam identified 39 findings in its assessment of the DOE activities within SSFL. None of the findings reflects a situation that, in the judgment of the Subteam, presents an immediate risk to public health and the environment. Twenty-two findings reflect conditions that do not meet the requirements of Federal and State of California laws and regulations, DOE Orders, or Site Contractor standard operating procedures. Seventeen findings represent conditions in which best management practices were not employed. Table 3-1 lists the Environmental Subteam's finding by discipline.

Background

Historically, Rockwell International Corporation, Rocketdyne Division, and its predecessor organizations have conducted programs for DOE and its predecessors in the areas of nuclear reactor development and applications, primarily within Area IV of the SSFL. In mid-1966, the DOE work at the predecessor of ETEC (Liquid Metal Engineering Center) was established and their work consisted of development and testing of liquid metal steam generators and pumps, seismic testing of full-sized piping systems, and testing of severe thermal transients on power plant components. Nuclear operations declined during this period with nuclear operations terminating in 1989.

The DOE decontamination and decommissioning activities within Area IV of the SSFL are releasing small quantities of radioactive particulates and organic and inorganic contaminants into the environment. The monitored radioactive releases, which are well below established dose concentration guidelines,

TABLE 3-1
ENVIRONMENTAL FINDINGS

Finding Number	Title	SAN Self-Assessment	Site Contractor Self-Assessment	DOE Survey Finding
A/CF-1	Inadequate Stack Emissions Monitoring Methods for Radioactive Particulates	N	P	NA
A/CF-2	Inadequate Meteorological Data	N	P	X
A/BMPF-1	Inadequate Characterization of Ambient Levels of Radioactive Particulates	P	P	NA
SSB/BMPF-1	Inadequate Physical Control of the Former Sodium Disposal Facility	N	N	NA
SSB/BMPF-2	Inadequate Stormwater and Sediment Characterization from the Northwest Area	N	N	NA
SW/BMPF-1	Inadequate Secondary Containment Practices and Procedures	N	Y	NA
SW/BMPF-2	Inadequacies in the Rockwell SPCC Plan and FSCP	N	N	NA
SW/BMPF-3	Inadequate Drinking Water Monitoring	N	N	NA
SW/BMPF-4	Inadequate Preventive Maintenance Program for Sanitary Sewers	N	N	NA
GW/CF-1	Lack of a Groundwater Protection Management Plan and a Groundwater Monitoring Plan	Y	Y	X
GW/CF-2	Incomplete Hydrogeologic Assessment Report (HAR) for B-886	N	N	NA
GW/BMPF-1	Inadequate Characterization of Hydrogeologic Regime	P	P	X
GW/BMPF-2	Inadequate Monitoring Well Security, Maintenance, Labeling, Inventory, Abandonment, and Construction	N	P	NA
GW/BMPF-3	Incomplete Decontamination of Groundwater Sampling Equipment	N	N	NA
GW/BMPF-4	No Organic Vapor Monitoring During Groundwater Sampling	N	N	NA
WM/CF-1	Inadequate Waste Minimization Program	Y	Y	NA

TABLE 3-1 (Continued)
ENVIRONMENTAL FINDINGS

Finding Number	Title	SAN Self-Assessment	Site Contractor Self-Assessment	DOE Survey Finding
WM/CF-2	Storage of Land Disposal Restricted (LDR) Mixed Waste	N	N	NA
WM/BMPF-1	Inadequate Hazardous Waste Verification	P	P	NA
WM/BMPF-2	Lack of Characterization of Sanitary Wastewater Treatment Plant Sludge	N	N	NA
TCM/CF-1	Incomplete Hazard Identification	P	P	X
TCM/BMPF-1	Storage of Incompatible Chemicals	Y	Y	NA
QA/CF-1	Deficient Quality Control of Vendor Analytical Laboratories	N	N	NA
QA/CF-2	Conflict of Interest Between Site Contractor QA/QC Coordinator and Environmental Analytical Lab Manager	N	N	NA
QA/CF-3	Handling of Corrections to Data and Records Archiving	N	N	NA
QA/CF-4	Lack of a Formal Pollution Prevention Awareness Program Plan	P	P	NA
QA/BMPF-1	Inadequate Environmental Monitoring Program	Y	Y	X
QA/BMPF-2	Environmental Protection Implementation Plan Approval	Y	Y	NA
RAD/CF-1	AIRDOS-PC Modeling Deficiencies	N	N	X
RAD/CF-2	Lack of Supporting Data to Modify Routine Environmental Surveillance	N	N	X
RAD/CF-3	No Contingency Plan for Transuranic Waste Storage	N	N	NA
RAD/BMPF-1	No Consistent Contamination Surveys on Packages	N	N	NA
IWS/CF-1	Inadequate Inactive Waste Site Corrective Action	P	N	X
IWS/CF-2	Hazardous Materials Business Plan Reporting Inadequacies	P	P	NA
IWS/CF-3	Incomplete Internal Reporting Procedures	N	N	NA

TABLE 3-1 (Continued)
ENVIRONMENTAL FINDINGS

Finding Number	Title	SAN Self-Assessment	Site Contractor Self-Assessment	DOE Survey Finding
NEPA/CF-1	Lack of Adequate and Integrated NEPA Procedures	N	N	NA
NEPA/CF-2	Inadequate NEPA Reviews and Milestones for the Budget Review Process	N	N	NA
NEPA/CF-3	Lacking and Inappropriate NEPA Determinations	P	P	NA
NEPA/CF-4	Incomplete NEPA Recordkeeping and Tracking	Y	P	NA
NEPA/CF-5	Inadequate NEPA Review of Proposed Actions	N	N	NA

Y	**Fully Covered**
P	**Partially Covered**
N	**Not Covered**
NA	**Not identified or covered in the Environmental Survey**
X	**Environmental Survey finding is still unresolved**

primarily come from radioactively contaminated facilities that are currently undergoing decommissioning and decontamination, and stored radioactive waste. Organic chemical releases primarily come from inactive waste sites which are impacting the groundwater, and to a limited extent, the surface water.

Inorganic chemical contamination, which is also associated with inactive waste sites, is locally impacting surface and subsurface soils and, to a much lesser extent, stormwater runoff.

To reduce potential contaminant releases from the current operations within Area IV, the Site Contractor has instituted an effective sanitary, non-hazardous, hazardous, and radioactive waste management program, and an effective surface water recycling program. These programs collectively limit waste and wastewater discharges and keep surface water discharges through NPDES permit stations below regulatory limits. The Site Contractor is also in the process of assessing the extent of surface and subsurface soil and groundwater contamination from inactive waste sites.

Line Management

SAN has been paying limited attention to the needs of the DOE activities at ETEC and has a limited role with regulators. SAN and the Site Contractor are, for the most part, reacting to regulatory requirements and public pressure, as opposed to being proactive, particularly with regard to the inactive chemical waste site remediation and associated groundwater characterization. The Site Office and the Site Contractor also have no dedicated environmental staffs addressing the environmental concerns at the ETEC facility resulting in the redelegation of DOE environmental activities to other competing priorities.

Findings Summary

The environmental and waste management programs for DOE activities within Area IV of the SSFL are generally in compliance with Federal and State of California environmental regulations. However, significant non-compliance exists with regard to many of DOE's environmental order requirements. The assessment identified three key programmatic findings: (1) inadequate air, stormwater, sediment, and groundwater monitoring (see Findings Air/CF-1, SSB/BMPF-2, and GW/BMPF-1); (2) inadequate chemical and physical hydrogeologic characterization (see Finding GW/BMPF-1); and, (3) a lack of DOE required environmental reports and Site Contractor standard operating procedures to help ensure environmental protection and compliance (see specific issues raised in nearly all environmental findings). Additional findings include inadequacies in secondary containment for aboveground storage tanks, and inappropriate assumptions and data used in mathematical modeling of airborne radionuclide emissions. A listing of all identified findings is presented in Table 3-1 and a complete discussion of these findings follows in this chapter.

Causal Factors

The apparent causal factors for the identified Environmental Subteam findings which occurred most frequently are a lack of, or inadequate, Site Contractor procedures, inadequate training of Site Contractor personnel, inadequate reviews and appraisals by both SAN and the Site Contractor, an ineffective allocation of resources to resolve environmental issues, and inadequate quality assurance/quality control which did not track known environmental concerns. These apparent causal factors, along with others identified during the assessment, are summarized in Section 2.1.2 and discussed within each finding as presented in Section 3.5.

Self-Assessment

During the Tiger Team Assessment of ETEC, the SAN and Site Contractor Self-Assessments were reviewed for thoroughness along with the DOE HQ Environmental Survey conducted in 1988. The review showed that the Self-Assessments were generally weak, and that many of the identified Tiger Team Assessment findings were either not formally identified, or only partially identified (see Table 3-1 and Chapter 6 of this report).

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3.5 ENVIRONMENTAL FINDINGS

3.5.1 Air

3.5.1.1 Overview

The purpose of the air portion of the environmental assessment was to assess the current Site Contractor operating practices with regard to regulations promulgated under the Clean Air Act, the Ventura County Air Pollution Control District (VAPCD) rules and regulations, and other pertinent statutes; DOE Orders; best management practices; and SAN and Site Contractor internal and regulatory procedures. Table 3-2 lists applicable regulations, guidelines, internal procedures, and DOE Orders used to evaluate the air discipline.

The general approach to the air assessment included an examination of the facilities and sources, including emission control systems, and effluent monitoring systems; interviews with Site Contractor, Site Office, SAN, VAPCD, South Coast Air Quality Management District (SCAQMD) personnel; an inspection of the Site Contractor ambient air quality monitoring network; and a review of Site Contractor documents and files.

Air pollution control and permitting at SSFL is regulated by the VAPCD. This district is part of the South Central Coast Air Basin, which is composed of Ventura, Santa Barbara, and San Luis Obispo Counties. This basin has generally achieved a better air quality than its neighboring county (Los Angeles) to the south. The SSFL is in a portion of Ventura County in which inversion conditions occur and which is not in attainment for ozone.

The primary radioactive and nonradioactive point sources are for stacks servicing the following buildings:

- Buildings 021 & 022, Radioactive Material Disposal Facility (RMDF);
- Building 020, the Hot Laboratory;
- Building 059, the Space Nuclear Auxiliary Power (SNAP) Decontamination and Decommissioning (D&D); and
- Building 356, the Sodium Component Test Installation (SCTI).

The discharge from each of the radiological stacks has different characteristics because of the unique nature of activities performed at each location. Radiological stack emissions from Site Contractor operations typically consist of solid particulates and adsorbable gases (e.g., tritium). The radiological stacks currently measure radioactive emissions.

The major heaters in the facility are all fired with natural gas. The primary emission of concern from these burners is oxides of nitrogen. The SCTI is being retrofitted with low-NO_x burners. Currently, the Site Contractor has about a dozen space heaters and boilers with air permits from the VAPCD.

TABLE 3-2
LIST OF APPLICABLE AIR
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
40 CFR 61	National Emission Standards for Hazardous Air Pollutants	EPA
40 CFR 58	Ambient Air Quality	EPA
40 CFR 60 Appendix A	Test Methods	EPA
EPA-600/4-77-027a	Quality Assurance Handbook for Air Pollution Measurement Systems	EPA
ANSI N131-1969	Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities	EPA
ANSI-2.5, N179 November 1979	Standard for Obtaining Meteorological Information at Nuclear Power Sites	
____________	Quality Assurance Handbook for Air Pollution Measurement Systems, Volume IV-Meteorological Measurements	EPA
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5400.xy	Radiological Effluent Monitoring and Environmental Surveillance (Draft)	DOE
VAPCD Permits	Permits 271, 290, 1124	VAPCD
VAPCD Rules and Regulations		VAPCD

Radioactive point sources of significance are provided with a variety of surveillance instrumentation including continuous sample collectors, and two of three major point sources are provided with radiation alarms.

Atmospheric concentrations of radionuclides are currently sampled by five samplers within Area IV. Meteorological data from the Burbank Airport are being used as input into the AIRDOS model, as suggested by the EPA.

There were three air findings, including Inadequate Emissions Monitoring, Inadequate Meteorological Data, and Inadequate Ambient Monitoring. The method currently in use to monitor radionuclide stack emissions does not meet the National Emission Standards for Hazardous Air Pollutants (NESHAP) requirements. There is no representative meteorological data base available as required. The current ambient radioactive particulate onsite monitoring system does not meet recommended siting and design criteria. The meteorological station that is currently being used to collect data in Area IV is not appropriately sited for a station used to measure representative site meteorology. That site was previously used for other programs, and was appropriately sited appropriately for those specific uses.

3.5.1.2 Compliance Findings

FINDING A/CF-1: Inadequate Stack Emissions Monitoring Methods for Radioactive Particulates

Performance Objective

The primary requirements for DOE to monitor radioactive particulates emissions from stacks and vents are provided in 40 CFR 61 Subpart H, National Emission Standards for Emissions of Radionuclides Other than Radon from Department of Energy Facilities. The stack and vent emissions monitoring and test procedures are provided in 40 CFR 61.93 which, in part, requires determination of radionuclide emissions.

Paragraph (4)(i) of 40 CFR 61.93 states, "Radionuclide emission measurements in conformance with the requirements of paragraph (b) of this section shall be made at all release points which have a potential to discharge radionuclides into the air in quantities which could cause an effective dose equivalent in excess of 1 percent of the standard," and "For other release points which have a potential to release radionuclides into the air, periodic confirmatory measurements shall be made to verify the low emissions."

Paragraph (4)(ii) of 40 CFR 61.93 states, "To determine whether a release point is subject to the emission measurement requirements of paragraph (b) of this section, it is necessary to evaluate the potential for radionuclide emissions from that release point. In evaluating the potential of a release point to discharge radionuclides into the air for the purposes of this section, the estimated radionuclide release rates shall be based on the discharge of the effluent stream that would result if all pollution control equipment did not exist, but the facilities operations were otherwise normal."

The methods required by the National Emission Standards for Hazardous Air Pollutants (NESHAP) to determine actual emissions if continuous monitoring is required are specified in 40 CFR 60 Appendix A, and in the American National Standard Institute Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities (ANSI N13.1-1969). Method 1 in 40 CFR Appendix A is the required method for determining the correct stack sampling location. Method 2 is the required method for determining stack velocity and volumetric flow rate. The majority of other stack sampling requirements are controlled by ANSI N13.1-1969. The long-term acceptance of these methods make it a best management practice to use these methods even when not specifically required by regulation.

The requirements for evaluating and monitoring all radioactive sources are contained in DOE 5400.xy (Draft), and DOE 5400.1 and DOE 5400.5. In addition, provisions for monitoring of atmospheric emissions during accident situations must be considered when determining routine atmospheric emission monitoring program needs.

DOE 5400.5, I.8.a, states, "Demonstrations of compliance with requirements of this Order generally will be based upon calculations that make use of information obtained from monitoring and surveillance programs. The abilities to detect, quantify and adequately respond to unplanned releases of radioactive material to the environment also rely on in-place effluent monitoring, monitoring of environmental transport and diffusion conditions, and assessment capabilities. This will enable DOE to develop useful data and to collect and analyze pertinent information on unplanned releases in a timely manner. It is the intent of DOE that the monitoring and surveillance programs for the DOE activities, facilities, and locations be of high quality. Although some differences result from specific site or specific activity conditions, uniformity in the methods performance criteria used in obtaining the information is desirable."

DOE 5400.xy (Draft) provides for recommended stack sampling methods, which are essentially the same as those required under NESHAP, and the primary method reference is ANSI N13.1-1969. If continuous monitoring is required, specific methods are required by NESHAP. If periodic monitoring is required, the same monitoring methods are recommended by DOE 5400.xy (Draft).

Specific requirements for stack monitoring include:

- Sampling locations shall be at least eight stack diameters downstream from the nearest upstream disturbance in flow, and at least two stack diameters upstream from the nearest downstream disturbance, in accordance with 40 CFR 60, Appendix A, Method 1.

- In accordance with ANSI N13.1-1969, the particle and gaseous composition in a stack shall be representative at the sampling point selected, or enough sampling points shall be sampled simultaneously to provide a representative sample. The flow distribution at the selected location shall be known so the rate of sampling can be near isokinetic for particles larger than 2 to 5 microns in diameter.

- The velocity distribution within the stack or duct shall be known at the sampling location to determine the isokinetic sampling rate in accordance with ANSI N13.1-1969, A3.3.

- Multiple sampling points across the stack shall be established in accordance with ANSI N13.1-1969, A3.2, if the stack diameter is greater than 8 inches unless careful studies show that uniformity of composition exists throughout the cross section of the duct.

- Sample location selection requires the consideration of changes in the quality of the particles and gases carried in the air stream as the air moves along the passage in accordance with ANSI N13.1-1969, A2. Changes which can occur and which shall be considered include:

  - Contaminated corrosion products from walls of ducts or the stack which may enter the stream.

  - Earlier-deposited material which may break off and enter the air stream.

Finding

Particulate radionuclide stack sampling within Area IV of the SSFL had not been evaluated in accordance with 40 CFR 61, and deficiencies in the radioactive stack monitoring were noted at the active Radioactive Materials Disposal Facility (RMDF), the inactive Hot Lab, and the former Space Nuclear Auxiliary Power (SNAP) reactor facility which are not in accordance with 40 CFR 61, DOE 5400.xy (Draft), or best management practice. Also, siting rationale had not been developed in accordance with DOE 5400.xy (Draft) using the methods specified by 40 CFR 61.

Discussion

Stack sampling for particulate radionuclides is conducted in the stacks servicing Buildings 021 and 022 (RMDF), Building 020 (Hot Laboratory), and Building 059 (SNAP D&D). Although the radionuclide emissions from these stacks are considered to be very low, the emissions from these stacks have not undergone formal evaluation for the potential of radionuclide emissions to the air in accordance with established NESHAP regulations.

Since the site had not formally demonstrated the low radioactive emissions from the stacks, it was required to conduct stack monitoring in accordance with the NESHAP regulation. Although the samplers at the RMDF and the Hot Laboratory had the required continuous radiation monitors to detect sudden increases in radiation during accident situations, deficiencies in the radionuclide particulate sampling systems, which have been in use since 1970, prevented the samplers from meeting established NESHAP requirements. Examples of the noted stack sampling deficiencies are as follows:

- An insufficient determination was made concerning the suitability of the DOE sampling location, and the necessary number of sampling points for each of the stacks within Area IV as required by NESHAP, ANSI N13.1-1969, and DOE 5400.xy (Draft). 40 CFR 60, Appendix A, Method 2 requires two complete traverses at right angles to each other across the full stack diameter. This had been done only at the stack servicing Building 020. The stack servicing the RMDF had only a single traverse done, and the stack at Building 059 had not been measured.

- The stacks servicing the RMDF, the Hot Laboratory, and the SNAP D&D did not have multiple sampling points. All of those facilities had stacks greater than eight inches in diameter. An insufficient characterization of the sampling sites had been done to be in accordance with ANSI N13.1-1969 to justify use of a single sampling point.

- The location of the stack sampler at the SNAP D&D was less than one stack diameter from the nearest flow disturbance, which was not in accordance with the requirements of 40 CFR 60, Appendix A, Method 1. The filter was not rigidly mounted, and it moved continuously, with the filter face at varying angles relative to the air flow, which was not in accordance with ANSI N13.1-1969.

- There was no alarm at the SNAP D&D to provide timely warning when the concentration of radionuclides increased significantly in the exhaust stream during accident situations as required by ANSI N13.1-1969.

- The samplers at the RMDF and at the Hot Laboratory were not designed to monitor the large range of particulates which may have been present as a result of High Efficient Particulate Air (HEPA) filter problems, deposition inside the stack, or corrosion buildup in the stack as required by ANSI N13.1-1969.

- The Site Contractor had not measured the size distribution in the stacks to determine the corrections required for an isokinetic sampling as required by ANSI N13.1-1969.

- The Site Contractor had not evaluated the line losses in the stack sampling system in accordance with ANSI N13.1-1969.

- The rationale for the design of the effluent monitoring systems had not been documented in the Environmental Monitoring Plan as required in DOE 5400.xy (Draft). The facility Environmental Monitoring Plan had not been developed (see Finding QA/BMPF-1). There was a written rationale developed in 1970, but it was not in accordance with ANSI N13.1-1969 as would be recommended by best management practice at that time, and later required by NESHAP until a determination was made that all of the sources met the requirement of having a potential to discharge radionuclides into the air in quantities which could cause an effective dose equivalent in excess of 1 percent of the standard.

If the site had evaluated the stack emission and had determined that the potential radionuclide exposure via the air was less than 1 percent of the effective dose equivalent of 10 millirem per year, the site could have conducted periodic, rather than continuous, sampling. Even if periodic sampling were allowed based on low exposure potential, best management practice would still dictate the need for the Site to comply with the NESHAP stack sampling methods.

Neither the SAN nor the Site Contractor's Self-Assessments included all of the deficiencies in the stack sampling systems with their findings (A-2 and A-3, respectively). The Site Contractor's Self-Assessment did mention overall lack of training of sampling personnel and some of the sampling deficiencies, and the SAN Self-Assessment mentioned that the stack sampling appeared to be nonisokinetic and that the sampling lines were too long.

During the Tiger Team Assessment, the Site Contractor conducted a potential emissions evaluation of one of the three sources, the SNAP D&D, and demonstrated to their own satisfaction that the emissions from this unit did not cause an effective dose equivalent in excess of 1 percent of the NESHAP standard. The Site Contractor also reported that it had subsequently evaluated the line losses in the sampler at the RMDF and had provided a fixed mount for the sampling filter at the SNAP D&D.

The causal factors for this finding appear to be inadequate Site Contractor <u>training</u> of appropriate Site Contractor personnel in sampling system design, operation, monitoring and maintenance, and inadequate Site Contractor <u>procedures</u> on stack sampling, stack sampling operations, monitoring, maintenance and routine training. In addition, the formal <u>appraisals/reviews</u> conducted by the Site Contractor and SAN did not detect most of these deficiencies in the emissions monitoring program.

FINDING A/CF-2: **Inadequate Meteorological Data**

Performance Objective

DOE 5400.1 requires DOE facilities to have representative meteorological data to support environmental monitoring activities. Offsite data may be used if it is representative of site conditions. If a determination has been made that offsite data are not representative of the site meteorology, the site must provide representative data by installing and operating meteorological instrumentation.

DOE 5400.xy (Draft) states, "Meteorological measurements shall be made in locations that provide data representative of the atmospheric conditions into which material will be released and transported. A meteorologist or other atmospheric scientist with experience in atmospheric dispersion and meteorological instrumentation should be consulted in determining whether onsite data are required and, if so, in selecting measurement locations and in the design and installation of the meteorological measurement system. Factors to be considered in selecting measurement locations and installation of the instruments include the prevailing wind direction, topography, and obstructions. Also, any special meteorological monitoring requirements imposed by other agencies (outside DOE) should be taken into consideration when designing meteorological measurement systems and establishing measurement locations."

Finding

The Site Contractor does not use meteorological data which are representative of site conditions as required by DOE 5400.1.

Discussion

The Site Contractor currently uses meteorological monitoring data from the Burbank Airport. The data from Burbank are not representative of site conditions. The Burbank Airport is located approximately 15 miles from the site and on the floor of the San Fernando Valley. The SSFL is located in a mountainous region approximately 1,000 feet higher in elevation than the airport.

The SAN Site-Assessment (A-2) did not identify any problems associated with meteorology, while the Site Contractor Self-Assessment did note some of the deficiencies with the meteorological data (A-3).

The causal factors for this finding appear to be no Site Contractor or SAN procedures requiring the use and development of meteorological siting criteria and the implementation of routine training in those procedures, and the Site Contractor and SAN have not provided needed training in the requirements of ambient monitoring programs.

3.5.1.3 Best Management Practice Findings

FINDING A/BMPF-1: Inadequate Characterization of Ambient Levels of Radioactive Particulates

Performance Objective

DOE 5400.xy (Draft), which includes specific requirements and recommendations concerning environmental surveillance, requires that the environmental surveillance program be conducted in accordance with the requirements of DOE 5400.1. DOE 5400.1 requires an ambient air surveillance monitoring program for significant pollutants or hazardous materials emitted in airborne effluents from the facility (Chapter IV, Section 4). This plan should include, but not be limited to the following:

- rationale and design criteria for the monitoring program,
- extent and frequency of monitoring and measurements,
- procedures for laboratory services, and
- quality assurance requirements.

The basic siting requirement for particulate sampling provided in 40 CFR 58, Appendix E, 8.2, states, "The sampler must also be located away from obstacles such as buildings, so that the distance between obstacles and the sampler is at least twice the height that the obstacle protrudes above the sampler..." Additionally, the inlet of the sampler is required to be between 2 and 15 meters above the ground, and written procedures must be used for sampling and calibrations.

The EPA's Quality Assurance Handbook for Air Pollution Measurement Systems, Volume II-Ambient Air Specific Methods (EPA-600/4-77-027a), also specifies the following:

- The particulates must be sampled from a height of 2 to 15 meters above the ground.
- The distance from any obstacle to the sampler must be at least twice the height the obstacle protrudes above the sampler.
- There must be an unrestricted air flow 270 degrees around the sampler.
- The sampler should be more than 20 meters from trees.
- Samples must be properly handled to ensure that there is no contamination and that the sample analyzed is actually the sample taken under the conditions reported.
- Chain-of-custody is required.

Finding

None of the five Site Contractor ambient radioactive particulate monitoring stations that are used to evaluate DOE activities within Area IV of the SSFL conform with the siting and sampling requirements in accordance with 40 CFR 58, EPA-600/4-77-027a, DOE 5400.xy (Draft), and DOE 5400.1. Also, there are no written procedures for handling samples, performing maintenance and calibrations, and no chain of custody documentation in accordance with EPA's Quality Assurance Handbook for Air Pollution Measurement Systems.

Discussion

The Site Contractor monitors ambient radiation from DOE activities within Area IV of the SSFL using five particulate samplers. Identified deficiencies include:

- None of the five Rockwell ambient air samplers for radioactive particulates meets the 40 CFR 58 and DOE 5400.xy (Draft) requirement for representative sampling.

- None of the samplers meets the requirements for separation from obstacles or height above the ground. The samplers must be at least 2 obstruction heights away from any obstacles, should be at least 20 meters away from any trees, and the sample inlet must be between 2 and 15 meters above the ground as required in EPA-600/4-77-027a and 40 CFR 58.

- In three stations (Building 020, Building 100 and the guard shack at the Radioactive Materials Disposal Facility), the samplers were attached directly to the wall of a building, so they also do not meet the requirement for 270 degrees unobstructed wind flow as required in EPA-600/4-77-027a and 40 CFR 58.

- There is no record of the criteria used to select the sampling sites, and no documented justification for decreasing the number of ambient samplers from eight to five as required in DOE 5400.1.

- There are no detailed written procedures for changing the filters or for calibrating the samplers as required in EPA-600/4-77-027a.

- Leak checks are only done on one of the eight filters on each sampler once each month, so a leak could go undetected for as long as 8 months. This is too long an interval to be considered in accordance with best management practice.

- The seven daily filter samples collected from each location each week are retained in their open top plastic holders when they are placed together in a plastic bag for transport to the laboratory, and they are not covered to prevent cross contamination as required in EPA-600/4-77-027a.

- Each plastic bag is assigned to a single sample location, and is reused without cleaning, to transport samples. Cross-contamination is a possibility with this procedure (EPA-600/4-77-027a).

- The filter holders are not cleaned before being reused, and the holders were observed to be dusty. Therefore, dust which was previously present could contaminate the filter (EPA-600/4-77-027a).

- The filters are not weighed to determine the amount of particulate matter on the filter prior to analysis, so it is impossible to correct for radiation measurement losses due to particulate loading. The layer of particulates collected can become thick enough when performing ambient sampling to absorb a significant portion of the alpha emissions during analysis.

In their Self-Assessments (A-2 and A-3, respectively), both SAN and the Site Contractor partially identified the problems with the air sampling program in Area IV of the SSFL. SAN noted that the Site Contractor air sampling program was not in compliance with the National Emission Standards for Hazardous Air Pollutant (NESHAP) program (40 CFR 61). The Site Contractor noted in its findings that air sampling protocols do not exist, there is a lack of training for sampling personnel, and an explanation is needed for reduction of air monitoring stations.

The causal factors for this finding appear to be a lack of SAN and Site Contractor <u>personnel</u> who have appropriate training in air sampling procedures; a lack of formal Site Contractor <u>procedures</u> for siting and operating the monitoring network, for changing and handling filters and holders for ambient particulate samplers, and analyzing the samples; a lack of a formal Site Contractor <u>training</u> program in the existing informal procedures which are in use; a lack of Site Contractor <u>procedures</u> for a routine training program; and Site Contractor, SAN, and Site Office <u>appraisals/reviews</u> did not identify all of the noted deficiencies.

3.5.2 Soil, Sediment, and Biota

3.5.2.1 Overview

The purpose of the soil, sediment, and biota portion of the Tiger Team Assessment was to evaluate both the programmatic and technical status of soil, sediment, and biota monitoring associated with DOE activities within Area IV of Rockwell's Santa Susana Field Laboratory (SSFL), as it relates to applicable regulations, industry and regulatory guidance, and best management practices. Applicable regulations include DOE Orders and EPA regulations under the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), which are summarized in Table 3-3. Best management practices are currently accepted methods and procedures in both industry and government programs.

The general approach to the soil, sediment, and biota assessment included interviews with the Site Contractor, SAN, and Site Office staffs; review of site documents, reports, field logs, and maps; and interaction with other members of the Tiger Team staff, including CERCLA, Radiation, Quality Assurance, and Surface Water specialists. Onsite inspections were conducted to view potential source areas of soil, sediment, and biota contamination, and to verify other information gathered during the assessment. The data and information gathered from these activities were reviewed and evaluated with respect to Federal, State of California, and DOE regulations and guidelines and current industry standards.

The near surface geology of Area IV is characterized by a thin veneer of soil overlying sandstone bedrock of the Chatsworth Formation. Massive outcrops of the Chatsworth Formation occur throughout Area IV, resulting in a highly variable soil column. The rugged topography of this area has required significant backfilling to accommodate building construction.

Soils in Area IV consist largely of sand and gravel alluvium and colluvium with thinner, irregular units of silty sand, silty clay, and backfill debris. Soil thickness varies from as little as 1 foot to approximately 13 feet. A highly fractured upper bedrock layer underlies the soil column locally, marking the transition from soil to bedrock.

Routine onsite and offsite soil sampling for radionuclides was conducted from the mid 1950's until 1989 (I-GW-15). Samples were analyzed for a combination of gross alpha and beta activity. This sampling program did not detect concentrations of radioactive materials in the soil, either onsite or offsite, that exceeded background levels. Select soil samples have been collected surrounding the location of historic radioactive contamination at the Radioactive Material Disposal Facility leach field. Samples from the "north slope" include gross beta values of up to 4,970 $\pm$177 pCi/gram. Remediation of this contamination is outlined in the facility's five-year plan.

The distribution of sediments, resulting from surface water runoff, is influenced by two drainage systems, separated by a surface water runoff divide that is oriented approximately northeast-southwest across Area IV. Several steep-gradient ephemeral stream channels are located along the northwest slope of Area IV. These streams are dry for most of the year; however, at the time of the Tiger Team Assessment they were free flowing. Sediments have accumulated in these streams through surface water runoff from Area IV;

TABLE 3-3
LIST OF APPLICABLE SOIL, SEDIMENT, AND BIOTA REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Section/Title	Authority
40 CFR 300	National Oil and Hazardous Substances Pollution Control Plan	EPA
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE

however, no systematic stream sediment sampling has been conducted to date for either chemical or radioactive contaminants. Surface runoff to the southeast is collected in a series of surface impoundments in the adjoining Area II. Sediment accumulation in the R-2A retention pond was sampled for radionuclides and found to be at background levels. Sediments in Bell Creek Canyon, downstream from R-2A, have also been sampled and show background levels of radionuclides (I-GW-15).

A variety of habitats at SSFL support a large number of animal species. Among the more common species are squirrels, deer, gophers, rabbits, raptors (hawks), bobcats, and rattlesnakes. Cattle have on occasion breached fencing to graze over portions of Area IV.

The vegetation present at SSFL is typical of semi-arid to arid region mountain flora. Among the more common species are varieties of broad-leaved evergreen shrubs, including sclerophyl, chamise, and manvanita. Additional common species include sage brush, shrub willow, and a variety of oaks and grasses (I-GW-15). A program of routine radiological sampling of local plants, both onsite and offsite, was conducted from the mid 1950's until 1987. Results from this program indicated that the surrounding flora did not contain radionuclide concentrations above ambient or background levels (I-GW-15).

The soil, sediment, and biota portion of the Tiger Team Assessment contains two best management practice findings. The findings address the inadequacies of the physical control mechanisms at the former Sodium Disposal Facility (B-886) to minimize the potential spread of radioactively contaminated soils and the lack of stormwater and stream sediment characterization downgradient from areas of known surficial contamination in Area IV. Relevant findings concerning the adequacy of soil, surface water, and vegetation sampling programs are discussed under the Inactive Waste Sites, Surface Water, and Radiation sections of this report.

3.5.2.2 Best Management Practice Findings

FINDING SSB/BMPF-1: Inadequate Physical Control of the Former Sodium Disposal Facility

Performance Objective

It is a good management practice to: (1) properly secure historic hazardous and radioactive waste disposal sites containing surface and subsurface contamination for the prevention of access by unauthorized personnel, livestock, and burrowing rodents and (2) take the appropriate measures to reduce the potential for erosional spread of contaminated soil, thereby preventing the uncontrolled spread of contaminants from the soil to humans, the food chain, offsite locations, and environmental media.

Finding

The former Sodium Disposal Facility (B-886) is not secured to prevent access to, and control contaminants spreading from, soil by unauthorized personnel, livestock, burrowing rodents, or erosion, which is not consistent with good management practices.

Discussion

The former Sodium Disposal Facility (B-886), located in the south end of Area IV, is the former site of hazardous and radioactive waste disposal (GW-10 and 23). Recent soil sampling results indicate that low-levels of radioactive and hazardous waste are present in the surface and subsurface soils at the former Sodium Disposal Facility (B-886) (GW-10, 20, and 23).

At the time of the Tiger Team Assessment, the former Sodium Disposal Facility (B-886) area was not secured and there was clear evidence of livestock grazing over the area and burrowing by rodents. Previous limited efforts to fence-off the area have been unsuccessful at preventing livestock intrusion. No efforts have been taken to control the burrowing rodent population which could potentially spread small amounts of contaminants offsite.

This issue was not raised as part of the SAN or Site Contractor (GW-25 and GW-24, respectively) Self-Assessments.

The causal factors for this finding appear to be inadequate Site Contractor <u>physical barriers and controls</u> to prevent access to the area, and inadequate Site Contractor, Site Office, and SAN <u>appraisals/reviews</u>, in that the issue was not recognized prior to the Tiger Team Assessment.

FINDING SSB/BMPF-2: Inadequate Stormwater and Sediment Characterization from the Northwest Area

Performance Objective

The Site Contractor is required under DOE 5400.1, Chapter IV, Section 5b to conduct environmental surveillance to monitor the effects, if any, of DOE activities for onsite and offsite environmental and natural resources impacts by November 1991. However, best management practice requires that facilities which have surficial contamination should be actively conducting stormwater and sediment sampling within stormwater drainageways downgradient of known sources of contamination to assess potential contaminant migration without waiting for the Order to take effect.

Finding

Stormwater and drainageway sediments downgradient of the northwest portion of Area IV have not been adequately evaluated to assess contaminant migration in accordance with best management practice.

Discussion

DOE's historic hazardous materials management practices within Area IV have resulted in surface and subsurface contamination. Sources of contamination have been identified, and stormwater runoff from some of the areas of the most significant contamination are being sampled and analyzed. However, the stormwater from other areas of potential concern, primarily along the northwest portion of Area IV, and the sediments within the downgradient stormwater drainageways from these areas, which are potential areas of contaminant accumulation, are not being sampled.

Stormwater samples from the northwest portion of Area IV are routinely collected during and after storm events from five sampling stations. The samples are subsequently analyzed for chemical and radionuclide analysis as required by the California Regional Water Quality Control Board - Los Angeles Region. The samples are being collected, in part, to establish baseline information for use in establishing National Pollutant Discharge Elimination System permit conditions for these stations in the upcoming NPDES permit renewal application. However, there are no sediment samples collected from these five sampling locations, or stormwater and sediment samples from other onsite and offsite areas which may be impacted by movement of the site's surficial contamination through wind and water transport mechanisms.

The SAN Self-Assessment (GW-25) recognized that environmental monitoring of the site was not being performed as required under DOE 5400.1. However, neither the SAN nor the Site Contractor's (GW-24) Self-Assessments recognized the inadequacies in the stormwater sampling program or the lack of a sediment sampling program.

The causal factors for this finding appear to be that there are no formal Site Contractor <u>procedures</u> to conduct sediment sampling or stormwater sampling from all areas of potential concern, and the Site Contractor and SAN <u>reviews/appraisals</u> did not identify these omissions.

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3.5.3 Surface Water

3.5.3.1 Overview

The purpose of the surface water portion of the Tiger Team Assessment was to evaluate compliance with regulations promulgated in response to the Clean Water Act and the Safe Drinking Water Act, DOE Orders, and SAN and Site Contractor policies and procedures. It also included a review of the adequacy of the sewage treatment plant (STP); the water use and reclamation program; the Spill Prevention Control and Countermeasures (SPCC) Plan; the Facility Spill Contingency Plan (FSCP); compliance with the National Pollutant Discharge Elimination System (NPDES) permit administered by the California Regional Water Quality Control Board - Los Angeles Region; and best management practices. Additionally, aboveground storage tanks were examined, including secondary containment. Applicable regulations are summarized in Table 3-4.

The general approach to the surface water assessment included inspection of wastewater sources and conveyance systems such as ditches and sewers, inspection of the sewage treatment plant and aboveground storage tanks, and a review of the water and wastewater monitoring program with special attention focused towards the procedures for NPDES and stormwater discharges sampling and analytical reporting.

As part of the surface water assessment, reviews and inspections were coordinated with other members of the environmental team as necessary to evaluate the surface water monitoring programs, the contribution and effects of groundwater cleanup programs on the reclamation water system, the disposal of wastewater treatment residues, and the potential surface water contamination from inactive or contaminated areas.

SSFL lies across the ridge that separates the Santa Clara River basin from the Los Angeles River basin. An estimated 90 percent or more of the total surface water runoff from SSFL flows into the Los Angeles River. The remainder flows into Calleguas Creek which enters the Pacific Ocean at Point Mugu.

Within SSFL, approximately 90 percent of the stormwater flows to reclamation ponds and the remainder leaves the area as surface flows through the northwest portion of Area IV. Five sampling stations have been installed for monitoring the northwest stormwater runoff within Area IV of the SSFL. Recently, these were installed at the direction of the Los Angeles Basin Regional Water Quality Control Board (see Finding SSB/BMPF-2).

In an effort to conserve water, the Site Contractor has developed a series of man-made catch ponds and retention basins that are an integral part of the sitewide Water Reclamation System. The System recovers most of SSFL's industrial water, rainfall, and treated sewage treatment plant effluents. There are two parallel, interconnected loops within this system. The loop serving Area IV also serves Areas II and III. Approximately five or six times annually, water is released from the water retention ponds serving this loop through NPDES discharge outfall 002. Fresh makeup water enters the Water Reclamation System at a central storage area in Area I.

Industrial water sources are limited to two principal onsite wells with additional water purchased from Ventura County Waterworks District No. 17.

TABLE 3-4
LIST OF APPLICABLE SURFACE WATER REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
Clean Water Act, 40 CFR 112	Oil Pollution Prevention	EPA
Clean Water Act, 40 CFR 122/123	National Pollutant Discharge Elimination System (NPDES)	EPA
40 CFR 125	Criteria and Standards for the NPDES	EPA
Safe Drinking Water Act, 40 CFR 141/142	National Primary Drinking Water Regulations	EPA
Safe Drinking Water Act, 40 CFR 143	National Secondary Drinking Water Regulations	EPA
Resource Conservation and Recovery Act, 40 CFR 262/264/265	Contingency Plan and Emergency Procedures	EPA
California Health and Safety Code, Chapter 6.95	Hazardous Materials Release Response Plans and Inventory	CA DHS
California Administrative Code, Title 23, Chapter 3	California Water Regulations	CSWRCB
California Water Code, Division 7	California Porter-Cologne Water Quality Act	CSWRCB
California Harbors and Navigation Code, Division 1.5, Navigable Waters, Chapters 3 and 4	California Oil Pollution Control Act	CSWRCB

TABLE 3-4 (Continued)
LIST OF APPLICABLE SURFACE WATER
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Program	DOE
DOE 5400.5	Radiological Protection of the Public and the Environment	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 6430.1A	General Design Criteria	DOE

Since 1959, drinking water has been purchased from several different licensed bottled water suppliers.

The largest sources of industrial wastewaters from DOE activities within Area IV are once-through cooling water and cooling tower blow downs. Certain streams, such as regenerant solutions from water conditioning systems, are sent offsite to licensed disposers. Radioactively contaminated liquids are handled in a special facility for disposal under radiation disposal regulations.

Domestic sewage from all buildings within Area IV is released to a sanitary sewage system and transferred to the Area III STP which serves Areas II, III, and IV. The Area III STP is a package-type aeration plant with sewage treatment accomplished via an aerobic activated sludge process, followed by alum and polymer addition, filtration through anthracite coal with chlorination of the filtrate prior to release from the STP. Spent sludge is drawn off and transferred once a month to a public sewage treatment facility at Cucamonga in the Chino and Van Nuys Sanitation District. During 1990, the STP operated at a flow of about 62,000 liters (16,400 gallons) per day which is 40 percent of its design capacity. To prevent inadvertent release of radioactivity via this path, the effluent from the STP's chlorine contact chamber is continuously monitored for radioactivity. The system is provided with an alarm which, if activated, would result in diversion to an adjacent basin where the water would be held for sampling and analysis. Radioactivity levels have never been such that the water was diverted to the holding basin. The treated effluent from the sewage treatment plant comprises about 15 percent of the total water in the Water Reclamation System at any given time. If all parameters are within NPDES discharge limits, water is released at a controlled rate at either of two NPDES discharge points. The frequency of these releases is directly related to rainfall and the number of the Site Contractor test programs.

The SSFL has been issued NPDES Permit No. CA 0001309 to release "filtered domestic wastewater and industrial wastewater from its two principal retention basins (R-2A Pond and Perimeter Pond)." Whenever there are extended periods of low activity at the site, the sewage treatment plant cannot meet the NPDES required removal efficiency of 85 percent for Biochemical Oxygen Demand and Total Suspended Solids. There are no releases during these conditions. The monitoring requirements are spelled out in detail in the NPDES Permit, as are reporting notifications. Examination of several years of monthly NPDES reports indicates compliance with permit limitations over 99 percent of the time with no pattern of exceedances noted.

There are four surface water findings, all of which are best management practice findings. The four best management practice findings relate to inadequacies in the preparation of the Spill Prevention Control and Countermeasures Plans and in implementing practices and procedures, lack of knowledge of the conditions of sewer lines and inadequate monitoring of the quality of bottled water delivered for potable usage.

3.5.3.2 Best Management Practice Findings

FINDING SW/BMPF-1: Inadequate Secondary Containment Practices and Procedures

Performance Objective

The Hazardous Material Response Business Plan and Inventory (Business Plan) Section 6, Paragraph 3.5 recommends that for facilities where a significant spill potential exists, certain countermeasures will be provided to include:

- Aboveground storage facilities within 500 feet of defined drainage channels will be provided with dikes to hold 100 percent of contents of the largest tank plus freeboard for rainwater and fire suppression agent.
- Aboveground storage facilities over 1,000 gallons, regardless of location, will be provided with dikes to hold 100 percent of contents of the largest tank plus freeboard for rainwater and fire suppression agent.

Generally accepted industry practices are to provide these containment for all aboveground storage facilities containing hazardous materials or oil, and to provide dike bottoms with impervious surfaces.

Finding

Secondary containment practices at SSFL are not in accordance with recommendations in the Business Plan or generally accepted best management practices. Additionally, the Business Plan secondary containment recommendations are, in the judgement of the team, contrary to generally accepted industrial practices.

Discussion

Within Area IV of the SSFL, DOE has a number of aboveground storage tanks containing hazardous wastewater, chemicals, and oils, and numerous oil-filled transformers. Examples where containment is not provided for aboveground hazardous material storage tanks of greater than 1,000-gallon capacity are two tanks at Building 059 and two tanks at the Sodium Component Test Installation (SCTI). Furthermore, surface-level mounted oil-filled transformers are not provided with containment structures, though many of the transformers are located adjacent to or less than 500 feet from surface drainage channels. Spills or catastrophic accidents from transformers would, therefore, require cleanup of contaminated soils or removal from retention ponds. The Site stated that the Ventura County Fire Department is not a proponent of secondary containment for transformers.

Further, it is standard industry practice that floor areas of secondary containment structures be provided with surfaces that are impervious to the materials being stored. However, the Business Plan recommends that floor areas within dikes be natural soil to allow for rainwater percolation.

This finding was not noted in the SAN Self-Assessment (SW-5), but the Site Contractor Self-Assessment (SW-6) suggested that secondary containment should be provided for storage of hazardous substances in Area IV. The Site Contractor has initiated action plans to provide containment for the Building 059 and SCTI tanks.

The causal factors for this finding appear to be inadequate DOE allocation of resources to correct the noted deficiencies, inappropriate Site Contractor procedures in the Business Plan which recommend natural soil floors within aboveground storage tank dikes, and inadequate appraisals/reviews by DOE and the Site Contractor in that these deficiencies were not formerly identified.

FINDING SW/BMPF-2: Inadequacies in the Rockwell SPCC Plan and FSCP

Performance Objective

The Spill Prevention Control and Countermeasures (SPCC) Plan, as required under 40 CFR 112, establishes requirements and procedures to prevent the discharge of oil from non-transportation-related onshore and offshore facilities into navigable waters of the United States. The Facility Spill Contingency Plan (FSCP), as required under 40 CFR 262, 264, and 265, establishes procedures to minimize the release of hazardous waste, or hazardous waste constituents, into the environment. Because both of these plans address the prevention and control of spills and releases at the SSFL, it is a best management practice to ensure that these plans are consistent.

As a best management practice, each plan should have information on the location of aboveground storage tanks, loading and unloading structures, material and waste storage locations, and the quantity of materials or waste stored at these locations with cross references to the location of the nearest equipment for controlling spills, as appropriate, with a definitive emergency response to the overflow of retention ponds. Additionally, SPCC Plans should be dated at the time of certification signature to provide a benchmark from which the plan may be reviewed and evaluated.

Finding

The Site Contractor's SPCC Plan and FSCP contain inaccuracies, inconsistencies, and deficiencies that are not in accordance with best management practice.

Discussion

To comply with established Federal regulations, and to control and minimize the accidental release of oils and hazardous materials including wastes, the Site Contractor has prepared an SPCC Plan and an FSCP. A review of these plans identified the following inaccuracies and inconsistencies:

- The plans are inconsistent in their descriptions of the group to contact for response to a spill (Section 2.5 of the SPCC Plan and Figure 4.1 of the FSCP).

- A number of typographical errors exist within the plans, with the most notable being the inaccurate transcription of the equation for calculating daily discharges (incorrectly excerpted from the SSFL NPDES permit).

- Section 4, Item 4.5, of the FSCP states that actions to be taken in response to a pollution spill are separated into five phases; however, the list in the plan contains only four phases.

- Spill control equipment locations listed on Page 52 of the FSCP are not complete, as inspection of a limited number of locations indicates that at least one location within Area IV, at the Sodium Component Test Installation, is not on the list. It should be noted that the Hazardous Waste Storage Facility Manager has a current listing of all locations of spill control equipment, which could be used to update the list in the plan.

- The SPCC Plan and the FSCP refer to Appendix D which lists tanks under the Hazardous Materials Inventory; however, the list is incomplete because it does not include two aboveground hazardous material storage tanks located at Building 059, loading and unloading structures for tanks, nor any of the aboveground tanks listed on Pages 1 and 2 (9-20-89) of the September 1989 Environmental Health and Safety Assessment (SW-5).

- Neither of the plans discuss the action that should be taken for a spill that could occur during overflow of the water reclamation ponds. Although the expected frequency of storm events that might cause overflow from the ponds at the SSFL is low, provisions for such an occurrence should be described in the plans.

- While the SPCC Plan was certified by a registered professional engineer and approved by nine Site Contractor managers, none of the signatures were dated. Since the plan specifies that it shall be reviewed and evaluated at least once every 3 years, the date of approval by management needs to be recorded at the time of signing, as the typed date on the plan's title page is not sufficient evidence of the approval date.

- The telephone numbers for the DOE Site Office Project Manager and the SAN Manager are not consistent between the SPCC Plan and the FSCP, and neither is correct.

This finding was not addressed in the SAN Self-Assessment (SW-5) but was partially identified in the Site Contractor's Self-Assessment (SW-6).

The causal factors for this finding appear to be that Site Contractor personnel are not fully <u>trained</u> in the requirements of an SPCC Plan and FSCP; there are no Site Contractor <u>procedures</u> that specify the requirements of the SPCC Plan and FSCP and routine training in the requirements. Another causal factor was inadequate SAN, Site Office, and Site Contractor <u>reviews</u> in that this issue was not identified as a concern.

FINDING SW/BMPF-3: **Inadequate Drinking Water Monitoring**

Performance Objective

Bottled drinking water supplied to drinking water dispensers is emptied into polyethylene holding tanks which serve coin operated beverage dispensers. Because it cannot be ensured that aseptic conditions will be maintained at the holding tanks for these beverage dispensers, as a best management practice a program of periodic sampling and analyses should be instituted to ensure that the water used in the beverage dispensing machines meets drinking water standards.

Finding

The Site Contractor does not monitor the quality of dispensed bottled drinking water at DOE facilities.

Discussion

In 1959, the Site Contractor made the decision to provide bottled water for SSFL drinking purposes to help ensure uniformity of quality and availability from multiple suppliers. Although the bottled water is purchased from a licensed supplier, there is no requirement by the Site Contractor to have the supplier certify the grade or quality of the water nor does the Site Contractor perform an independent check on the quality of the dispensed drinking water, particularly the bottled water used in the preparation of beverages dispensed from coin operated machines.

It should be noted that Site Contractor technicians follow cleanliness procedures when emptying bottled water into the polyethylene storage tank serving the beverage dispensing machine, including visual examination for possible microbiological growth. However, there are no procedures for, or evidence of, water quality analysis from the beverage dispensers by either the Site Contractor, the vending machine operators, or the bottled water suppliers.

This finding was not identified in the Site Contractor or SAN Self-Assessments (SW-5 and SW-6, respectively).

The causal factors for this finding appear to be that there are no Site Contractor procedures that require routine Site Contractor sampling at the drinking water outlets, and that require the bottled water supplier to periodically furnish water quality analyses to the Site Contractor. Also, the Site Contractor and SAN appraisals/reviews did not identify the problem.

FINDING SW/BMPF-4: **Inadequate Preventive Maintenance Program for Sanitary Sewers**

Performance Objective

In accordance with best management practices, periodic inspection of sanitary sewers (preventive maintenance program) should be performed to minimize the potential for contamination of soils and groundwater through sewer line exfiltration, as well as to minimize potential to overload the sewage treatment plant through sewer line infiltration.

Finding

The Site Contractor does not have a preventive maintenance program for periodic inspection and repair of sanitary sewer lines in accordance with best management practice.

Discussion

The sanitary sewers at SSFL are a combination of gravity flow and force (pressure) lines. There is no record of installation dates, but the latest modifications to sewer drawings indicate that the sewage collection system is at least 14 years old. The gravity flow sewer pipes are reportedly made of clay while the force mains are constructed from PVC pipe. Sewage Treatment Plant No. 3, which receives sewage from the DOE facilities, may also receive inorganic and organic chemicals as well as radionuclides, since only administrative controls are employed at some sources where wastewater enters the sewage system.

There is no established inspection program for the sanitary sewers to ensure their integrity. Consequently, it is not possible to determine if exfiltration is occurring during dry weather. While there are periodical high flows during the rainy seasons, the Site Contractor does not know if these occur from damaged sewer lines, poorly secured manholes, or malfunctioning sanitary equipment.

Although the Site Contractor is aware of infiltration into the lines during the rainy season, inspections have not been conducted to determine the conditions of the sanitary sewer lines. This finding was not identified in the SAN and Site Contractor Self-Assessments (SW-5 and SW-6, respectively).

The causal factors for this finding appear to be that the Site Contractor has no <u>procedures</u> to conduct periodic evaluations of the wastewater collection system, and inadequate SAN, Site Office, and Site Contractor <u>appraisals/reviews</u> in that this issue was not previously identified.

3.5.4 Groundwater

3.5.4.1 Overview

The purpose of the groundwater portion of the Tiger Team Assessment was to evaluate both the programmatic and technical status of groundwater monitoring associated with DOE activities within Area IV of SSFL as it relates to applicable regulations, industry and regulatory guidance, and best management practices. Applicable regulations include DOE Orders and the California Toxic Pits Cleanup Act of 1984. Industry and regulatory agency guidance includes publications developed as part of RCRA and CERCLA by EPA, and standards developed by the California Regional Water Quality Control Board. Applicable regulations and guidance documents are summarized in Table 3-5. Best management practices are currently accepted methods and procedures in both industry and government programs.

The general approach to the groundwater assessment included interviews with Site Contractor, DOE, SAN, and Site Office staffs; interviews with regulatory authorities, including EPA and the Regional Water Quality Control Board; review of site documents, reports, field logs, and maps; and interaction with other members of the Tiger Team staff, including CERCLA, Radiation, Quality Assurance, and Surface Water specialists. Onsite inspections were conducted on a regular basis to view groundwater wells and potential source areas of groundwater contamination, and verify other information gathered during the assessment. Groundwater sampling procedures were observed during a routine sampling event. The data and information gathered from these activities were reviewed and evaluated with respect to Federal, State of California, and DOE regulations and guidelines and current industry standards.

The SSFL is located in the Simi Hills of eastern Ventura County California, between San Fernando Valley and Simi Valley. Numerous studies, beginning as early as 1958, have characterized the stratigraphy and structural geology of the Simi Hills. The Simi Hills consist principally of the upper portion of the Cretaceous Chatsworth Formation, a marine turbidite (clastic sediment) sequence measuring at least 6,000 feet in thickness. The rugged terrain of the Simi Hills has resulted from weathering of the resistant, cliff-forming sandstone beds.

The upper Chatsworth Formation underlies most of the SSFL facility. It is composed of well consolidated, arkosic, massively bedded sandstone with interbeds of siltstone and claystone. The original matrix porosity of the sandstone has been significantly decreased by carbonate cementing of sand grains. In Area IV, the location of almost all DOE activities on the SSFL, the Chatsworth Formation dips to the northeast at approximately 20 to 30 degrees. Massive sandstone outcrops are present throughout SSFL, including Area IV, with well-developed fractures, joints, and partings along bedding planes.

The hydrogeologic setting of SSFL has been extensively studied; however, many uncertainties persist with regard to Area IV. Groundwater beneath Area IV occurs principally in two units: a surficial unconsolidated sandy silt/clay silt aquifer, and a deep, fracture-dominated sandstone bedrock aquifer (GW-31). The distribution of the surficial seasonal aquifer is irregular and

TABLE 3-5
LIST OF APPLICABLE GROUNDWATER REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Section/Title	Authority
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan	EPA
40 CFR 264 and 265	Standards and Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities	EPA
OSWER Directive 9950.1	RCRA Ground Water Monitoring Technical Enforcement Guidance Document	EPA
OSWER Directive 9355.3-01	Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA	EPA
OSWER Directive 9283.1-2	Guidance on Remedial Actions for Contaminated Ground Water at Superfund Sites	EPA
OSWER Directive 9502.00-6D	RCRA Facility Investigation (RFI) Guidance	EPA
DOE 5400.1	General Environmental Protection Program	DOE
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
Chapter 1543 Health and Safety Code	Toxic Pits Cleanup Act of California	
Bulletin 74-81	Water Well Standards	Department of Water Resources
OSWER Directive 9950.3	Operation and Maintenance Inspection Guide (RCRA) Ground Water Monitoring Systems	EPA

TABLE 3-5 (Continued)
LIST OF APPLICABLE GROUNDWATER
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Section/Title	Authority
EPA 600/52-85/105	U.S. EPA Decontamination Techniques for Mobile Equipment Used at Hazardous Waste Sites	EPA
EPA Memo, November 1984	EPA Standard Operating Safety Guides	EPA
EPA/NIOSH/OSHA Manual Oct. 1985	U.S. EPA Occupational Safety and Health Manual for Hazardous Site Activities	EPA

ill-defined. It is, in essence, a perched, unconfined aquifer, which responds rapidly to local precipitation. Groundwater has been noted in this aquifer in several well locations in Area IV.

Groundwater occurs in the deep sandstone aquifer at depths ranging from approximately 100 to 400 feet below the surface near the former Sodium Disposal Facility. This aquifer is largely fracture controlled, with minimal matrix storage or matrix transport, due to secondary carbonate cementing of sand grains. Joints, fractures, and bedding plane partings throughout the sandstone provide the principal pathways for groundwater and contaminant transport in the Chatsworth Formation. Features of this nature complicate hydrogeologic interpretations due to the complexity of fluid flow in these irregular conduits.

Groundwater flow directions beneath the SSFL are influenced by natural and induced flow gradients. Groundwater has been extracted from portions of SSFL for many years for process purposes, and more recently for groundwater remediation purposes. The extraction wells are located in Areas I, II, and III. These wells have generated a concentric, induced gradient, causing groundwater underlying much of the SSFL to flow inward from the site extremities. This is credited for providing a high degree of onsite contaminant capture for these areas. Area IV, however, overlies a groundwater divide which extends in a northeast-southwest direction along its eastern boundary with Area III. Groundwater from the eastern-most portion of Area IV flows into the induced capture zone of Areas I, II, and III. Groundwater underlying the central and western portion of Area IV, where all of the DOE potential contamination sources lie, flows toward the northwest, away from the Site Contractor extraction wells.

There are a number of documented potential groundwater contaminant sources in Area IV (GW-20 and 39). Most of these locations are sites of former or current waste disposal, waste storage, or bulk equipment/construction debris storage, including:

- Former Sodium Disposal Facility (B-886)
- Landfill (B-056)
- Trench (B-100)
- SNAP Reactor Building (B-059)
- Sodium Burn Facility (B-133)
- ESADA Storage Yard
- Southeast Drum Storage Yard
- Old Conservation Yard
- New Conservation Yard
- Radioactive Materials Disposal Facility (RMDF)

Of the facilities listed above, the former Sodium Disposal Facility (B-886) and the RMDF are the only locations of significant concern from the standpoint of potential groundwater contamination. Area IV currently has a network of 28 groundwater monitoring wells and several offsite groundwater seeps (artesian wells) (GW-31) that are sampled on a quarterly or semiannual basis for a variety of potential chemical and radioactive contaminants. The majority of the groundwater wells within Area IV are open boreholes in the Chatsworth Formation, some extending to depths of approximately 700 feet. In addition, there are a number of wells designed for monitoring shallow (upper aquifer) groundwater conditions (GW-12). The Site Contractor has developed plans for installing additional clustered groundwater monitoring wells at two offsite locations, downgradient of the former Sodium Disposal Facility (B-886) and the Radioactive Material Disposal Facility, during the spring of 1991 (GW-21).

The groundwater portion of the Tiger Team Assessment identified two compliance findings and four best management practice findings within Area IV of the SSFL. The compliance findings include the lack of Groundwater Protection Management Plan and an incomplete Hydrogeologic Assessment Report for the former Sodium Disposal Facility (B-886). The best management practice findings include inadequate characterization of the hydrologic regime; inadequate monitoring well construction, security, labeling, maintenance, and abandonment; inadequate health and safety precautions during groundwater sampling; and incomplete decontamination of field sampling equipment.

3.5.4.2 Compliance Findings

FINDING GW/CF-1: Lack of a Groundwater Protection Management Plan and a Groundwater Monitoring Plan

Performance Objective

DOE 5400.1, Chapter III, subparagraph 4.a, requires each Head of Field Organization to develop a Groundwater Protection Management Plan to be completed by May 1990, with annual reviews and updates every 3 years. A Groundwater Monitoring Plan is further required to be prepared under DOE 5400.1 as part of the Groundwater Protection Management Plan and should be in place any time the subsurface investigations are occurring.

Finding

The Site Contractor does not have a comprehensive Groundwater Protection Management Plan as required by DOE 5400.1.

Discussion

Since 1988, preliminary programs have been underway within Area IV to define the nature and extent of contamination associated with DOE activities. Assessment plans have been forwarded to the regulatory officials to begin a more aggressive evaluation of Area IV, including the installation of two offsite monitoring well clusters. However, DOE 5400.1 requires the development of a comprehensive Groundwater Protection Management Plan and a Groundwater Monitoring Plan before resources are committed to such a project. The intent of these plans is to ensure that groundwater investigation activities are part of a well coordinated, technically sound, and thorough approach to managing groundwater resources, contaminant distribution, and remedial actions. The Site Contractor has not developed either of these plans.

The lack of a formalized Groundwater Monitoring Plan and a Groundwater Protection Management Plan has been documented by the SAN and Site Contractor Self-Assessments (GW-25 and GW-24, respectively).

The causal factor related to the continued absence of these plans appears to be inadequate SAN <u>resource</u> allocation dedicated to the development of these plans.

FINDING GW/CF-2: Incomplete Hydrogeologic Assessment Report (HAR) for B-886

Performance Objective

Chapter 1543, Article 9.5, Section 25208.8 of the California Toxic Pits Cleanup Act requires a Hydrogeologic Assessment Report (HAR) of surface impoundments to include an analysis for pollutants in the vadose zone (especially those chemicals discharged to the impoundment) and a demonstration that the monitoring system and methods used at the facility can detect any seepage before the hazardous waste constituents enter the waters of the State.

Finding

The HAR, as requested by the Los Angeles Regional Water Quality Control Board for the former Sodium Disposal Facility (B-886), does not meet all of the requirements of Section 25208.8 of the TPCA in that it does not have a description of vadose zone contamination and a demonstration that the monitoring system and methods used at the facility are capable of detecting seepage from the impoundment before hazardous waste constituents enter the waters of the State.

Discussion

In accordance with a directive issued by the Los Angeles Regional Water Quality Control Board (RWQCB) in April 1990 (GW-22), the Site Contractor submitted a HAR (GW-23) for the Lower Pond, former Sodium Disposal Facility (B-886), located in Area IV. The RWQCB, Site Contractor, and SAN are currently negotiating to regulate closure of B-886 under the guidelines of the TPCA of 1984.

Deficiencies with the State TPCA requirements were noted in the HAR by the Tiger Team and are discussed below under vadose zone investigations and monitoring system requirements.

<u>Vadose Zone Investigation</u>

Included in the requirements for the HAR is a chemical and hydrogeological description of the unsaturated zone beneath the surface impoundment. Under TPCA, the vadose zone is defined as the zone between the land surface and the water table, including consolidated and unconsolidated rock. The vadose zone characterization presented in the HAR is limited to shallow soil sampling with hand-held "shelby tube" samplers and backhoe trenching. This sampling does not begin to assess the unsaturated zone between the soil overburden and the water table, which represents a significant potential reservoir of contaminants that may not have yet reached the water table. It is reasonably well documented (GW-20 and 23) that the B-886 soil and underlying groundwater are contaminated with a variety of organic chemicals. By ignoring the potential contaminant reservoir of over 200 to 400 feet of fractured unsaturated sandstone, a significant long-term source for continued contaminant leaching may be missed.

Monitoring System Requirements

The intent of the HAR requirement is for the facility to demonstrate that it has a monitoring system in place for both groundwater and the vadose zone that is capable of detecting leachate migration from the impoundment, prior to it entering the waters of the state. Based on the existing monitoring system, including wells RD-21, 22, 23, and RS-18, this requirement of the HAR is not being met for the following reasons:

- The existing wells are positioned such that contaminant migration from the impoundment may not be detected, especially under the conditions of fracture-dominated groundwater flow.

- The vadose zone is not being monitored for possible leachate migration through fractured Chatsworth Formation sandstone.

SAN and the Site Contractor Self-Assessments (GW-24 and GW-25, respectively) did not address this issue; however, the Site Contractor has made an effort to address issues of this nature by recently hiring a new hydrogeologist, at the request of DOE-SAN.

The causal factors for this finding appear to be inadequate DOE-SAN resource allocation, in that the technical staff at DOE-SAN did not review the HAR requirements, or sufficient funds were not allocated to subcontract the review services; inadequate appraisals/reviews, in that SAN, or its designated independent consultant, did not conduct a review of the HAR prior to its submittal; and the fact that the problem was not identified in the Site Contractor, Site Office, or SAN appraisals.

3.5.4.3 Best Management Practice Findings

FINDING GW/BMPF-1: Inadequate Characterization of Hydrogeologic Regime

Performance Objective

It is a best management practice to adequately characterize the hydrogeologic regime of an aquifer and vadose zone underlying former hazardous waste disposal areas. The characterization should be of sufficient detail to define the aquifer physical parameters including flow velocity, transmissivity/conductivity, flow directions, and vertical/horizontal gradients. Furthermore, the characterization should be of sufficient detail to define the nature and distribution of aquifer and vadose zone contamination, including contaminants present both onsite and offsite, and the rates of contaminant migration.

Finding

The hydrogeologic regime underlying Area IV of the Santa Susana Field Laboratory has not been adequately characterized to define the aquifer physical parameters, the nature and extent of the contamination in the saturated and unsaturated zones, and the rate and directions of contaminant migration in the subsurface in accordance with best management practices.

Discussion

Hydrogeologic investigations of the Santa Susana Field Laboratory have been ongoing since mid 1958 (GW-11). Organic contamination of the underlying aquifer was first detected in Areas I, II, and III in 1984. In May 1988, the first of a series of reports (GW-39) was released which described potential areas of surface and subsurface contamination in Area IV. Although a Groundwater Monitoring Plan has not been prepared (see Finding GW/CF-1) for Area IV hydrogeologic investigations, some preliminary steps toward site characterization have been taken by the Site Contractor in a stepwise progression, including the establishment of 18 new monitoring wells (GW-10) for long-term tracking of groundwater quality. Plans are currently under review for conducting the next phase of hydrogeological investigations.

Despite some progress made toward characterizing the Area IV hydrogeologic regime, large informational gaps remain that prevent an accurate assessment of the environmental groundwater impacts of past waste disposal practices resulting from DOE activities managed under the ETEC contract. Among the currently unresolved issues are: (1) the physical parameters of groundwater flow and (2) the nature and distribution of chemical contaminants, and the rate of contaminant migration in the saturated and unsaturated zones as discussed below:

<u>Physical Parameters</u>

There is limited information regarding the aquifer characteristics underlying Area IV. Groundwater underlying SSFL occurs principally in two interconnected aquifer systems: a shallow, unconsolidated overburden aquifer and a deeper consolidated sandstone aquifer. The shallow system is present as a perched aquifer only during wet seasons in Area IV. The deeper sandstone aquifer has a groundwater elevation that ranges from approximately 100 to 400 feet below the Area IV surface.

The groundwater physical parameters of concern include porosity, flow velocity, transmissivity, hydraulic conductivity, hydraulic gradient, and flow directions. Many of these parameters are only partially understood for the aquifers underlying Area IV. Informational deficiencies noted include the following:

- Groundwater flow velocity below Area IV is currently unknown. Existing studies (GW-10) have demonstrated, through short-term pump tests, that recharge and sustained yield in the fractured sandstone is very low. Long-term multiwell pump tests or tracer tests have not been conducted in Area IV; however, based on recovery rates of existing Area IV wells, long-term pump tests may not be effective.

- The nature of groundwater flow along fractures and bedding planes is currently unknown. Of particular concern is the degree to which fractures and bedding planes form a broad, interconnected network. Surficial expressions of fractures and faults have been mapped in 1958 and in recent years.

- There is no information regarding the nature of vertical gradient in the Chatsworth Formation underlying Area IV.

- There is a limited amount of information concerning the precise direction of groundwater flow beneath Area IV. Although general flow directions have been established from groundwater head data across Area IV, flow in the secondary porosity features such as fractures and bedding planes has not been assessed.

Distribution of Chemical Contaminants

There is currently insufficient information regarding the horizontal and vertical distribution of chemical contaminants in the groundwater and vadose zone underlying Area IV. Existing monitoring wells are providing regular data for evaluation of groundwater quality. The following deficiencies or concerns remain:

- The existing groundwater monitoring network cannot provide sufficient coverage of Area IV to ensure adequate groundwater quality characterization. Monitoring well coverage surrounding the former Sodium Disposal Facility (B-886) (RD-21, 22, 23, and RS-18) cannot adequately detect downgradient groundwater flow from the former disposal pits/ponds. Similarly, monitoring wells located near the Radioactive Material Disposal Facility (RD-27, 30, and RS-28) are not sufficient to provide adequate downgradient coverage from the former leach field. A plan for Phase IV activities (GW-21) has been submitted to SAN and the regulatory agencies for the construction of clustered monitoring wells located offsite and downgradient from these two areas of concern.

- The existing groundwater monitoring well network is not capable of adequately detecting potential offsite migration of contaminants from Area IV, although plans are currently under review by SAN and the regulatory agencies for the construction of additional offsite wells.

- No sampling has been conducted to date to characterize the potential for chemical contamination of the deep vadose zone (bedrock) underlying areas of concern in Area IV. Shallow soil sampling has been conducted (GW-31) at numerous locations, identified by DOE as solid waste management units (GW-39), with the use of a backhoe and hand-held sampling devices (see Finding GW/CF-2).

- The existing open borehole monitoring wells in Area IV cannot provide depth-discrete information regarding the presence or concentration of contaminants. As a result, little is known about the vertical distribution of contamination.

- Studies have not been conducted to determine the potential for dense non-aqueous phase liquids (DNAPL's) in Area IV. The presence of DNAPL's can greatly complicate remediation efforts by acting as a long-term source of contamination. These dense phase liquids tend to accumulate in small pockets where further downward migration is inhibited by an impervious zone. In the saturated zone, slow chemical partitioning or dissolution from the nonaqueous to the aqueous phase can result in significant underestimations of the time necessary to achieve cleanup goals.

- No information is currently available concerning the nature of chemical retardation in the saturated or unsaturated zones. Furthermore, no efforts have been made to predict the nature and extent of contaminant transport through modeling. This is largely due to a lack of appropriate data, such as multi-well pump data, rather than a lack of resources.

There is a need for additional hydrogeologic characterization studies of Area IV. The need for additional studies was recognized as part of the Site Contractor Self-Assessment (GW-24). SAN partially recognized this issue (GW-25). Toward this goal, the Site Contractor, under DOE direction, is planning programs of further investigation, including the construction of two Phase IV monitoring well clusters offsite and down-gradient from Area IV and one deep onsite well located at the Burrow-Flats Fault.

The causal factors for this finding appear to be a lack of appropriate <u>resources</u> from SAN to conduct the necessary studies and provide the needed independent technical review and evaluation of proposed actions, and a lack of appropriate Site Contractor <u>personnel</u> to critically evaluate the scope and direction of hydrogeologic investigations.

FINDING GW/BMPF-2: Inadequate Monitoring Well Security, Maintenance, Labeling, Inventory, Abandonment, and Construction

Performance Objective

Industry practice, EPA technical guidance documents (GW-33 and 34), and regulatory agencies are in general agreement that monitoring wells and boreholes should be: (1) properly constructed; (2) properly secured and maintained to prevent potential contamination of the subsurface from intentional or unintentional activities at the surface; (3) properly labeled and inventoried to avoid confusion and possible misrepresentation during sampling events; and (4) properly abandoned to ensure that the subsurface is not exposed to contaminant migration through the open borehole, casing, screen, or annular space.

Water Well Standards of the State of California and standard industry and regulatory agency practice require that wells used for monitoring purposes shall be "properly constructed such that the space between the well casing and the wall of the drilled hole (the annular space) is effectively sealed to protect it against contamination or pollution by entrance of surface and/or shallow subsurface waters." Furthermore, it is a standard industry practice that the surface finish of a monitoring well is of sufficient integrity to ensure that potential contaminants do not enter the aquifer from the ground surface.

Finding

Approximately 30 percent of the wells used for monitoring contamination from DOE facilities, managed by Rockwell under the ETEC contract, are inadequately secured, maintained, labeled, inventoried, and/or constructed, and one well was improperly abandoned, which is not in accordance with current industry/regulatory agency practice and California Water Well Standards.

Discussion

Inadequate monitoring well security was noted at 6 of 26 well locations in Area IV. Well WS-7, originally used for water supply purposes, is an older well, currently used for groundwater sample collection and is located near the northeast edge of Area IV. It was noted that WS-7 did not have a protective well cap on the 4-inch steel casing and no locking mechanism was in place for security purposes. Well RS-25, located on the north side of the new Sodium Burn Facility (B-133), did not have a locked lid on the protective steel casing. Wells RD-24, RD-25, and RD-28 are constructed with a flush mount gate box surface finish in the B-059 area; the gate boxes were not equipped with locking mechanisms. Similarly, well RD-27, located in the Radioactive Material Disposal Facility area, was not equipped with a locking mechanism. Adequate monitoring well security is vital to ensuring the integrity of the well and preventing potential contamination from intentional or unintentional activities.

Inadequate monitoring well maintenance was noted at three well locations at the time of the investigation. The concrete well pad, which forms part of the well seal, was seriously undercut by surface runoff at wells RD-23 and RD-7, located near the former Sodium Disposal Facility (B-886) and the B-56

Landfill, respectively. The concrete pad at well RD-21 has been severely damaged by an unknown source, resulting in large cracks and separation between the steel casing and the concrete.

Based on standard industry practice, well pads for RD-23 and RD-7 were not properly constructed, thereby jeopardizing the integrity of the well seal system. Well RD-23 has a 4-inch thick square concrete pad, measuring approximately 3 feet on each side, which was constructed on top of the drill cuttings from the borehole. Surface runoff from the former Sodium Disposal Facility (B-886) has severely undercut the well pad by washing away the fine cuttings. RD-23 is located in a drainage channel, down-slope from contaminated soil at B-886, and is therefore in need of a deeper-seated and thicker well pad to ensure long-term viability and protection from surface runoff. Borehole cuttings, which are used to support the RD-23 well pad, offer very little structural support. Similarly, well RD-7 was constructed on the ground surface and has been undercut by surface runoff. Well pad thickness should reflect the degree of protection needed and the potential for impact from surface water runoff, frost heaving, etc.

Most monitoring wells in Area IV appear to be properly labeled; however, well RS-25, located on the north side of the new Sodium Burn Facility (B-133) was not labeled. Proper well labeling is vital to ensuring that field personnel do not misrepresent groundwater samples as a result of incorrect well labeling. An older unlabeled well, located northeast of the SRE facility, was also discovered. This well was apparently not part of the Area IV monitoring well inventory.

The unnamed well near the SRE appears to be abandoned; however, no actions have been taken to ensure that proper abandonment, as defined in the California Water Well Standards, has been completed. This well does not appear to be sealed from bottom to top with an impervious material and may be acting as a channel for potential contaminant migration from the surface or upper aquifer levels to deeper levels.

Well WS-7 is currently in use for sampling groundwater in Area IV. The precise date of construction is unknown; however, records indicate that it was logged by geophysical methods as early as 1984. WS-7 was originally used for water supply, with a total depth of approximately 700 feet. The well has a 12-inch steel casing to a depth of 400 feet with an open borehole to 700 feet. Records indicate (GW-12) that the well was not constructed with an annular seal and has not been retrofitted with a seal prior to use as a sampling well; therefore, the integrity of these samples is in question.

Well RS-18 is located in a primary drainage channel downslope from B-886. The well was constructed with a flush mount rectangular gate box. At the time of the site visit, well RS-18 was completely submerged in runoff water from the B-886 area. The surface finish for RS-18 is improper for the location of the well due to the potential for contaminated surface water to enter the borehole and contaminate the upper aquifer.

The issue was partially identified in the SAN Self-Assessment (GW-25) through identifying the lack of a sitewide monitoring well standard operating procedure. The issue was not identified in the Site Contractor Self-Assessment (GW-24).

The causal factors for this finding appear to be inadequate Site Contractor procedures for proper monitoring well security, maintenance, labeling, inventory, abandonment, and construction requirements; lack of Site Contractor training in these activities for responsible site personnel; and lack of procedures necessary to ensure that the routine training is conducted. Furthermore, there are inadequate Site Contractor, Site Office, and SAN appraisals/reviews which have not identified these problems.

FINDING GW/BMPF-3: Incomplete Decontamination of Groundwater Sampling Equipment

Performance Objective

EPA Guidance Documents (GW-35 and 36) outline standard decontamination procedures for sampling equipment. Standard industry practice requires that these protocols, at a minimum, are implemented for all non-dedicated groundwater sampling equipment. Decontamination procedures will vary depending upon the nature of contaminants encountered and the type of sampling equipment used. At a minimum, sampling equipment should be disassembled (if applicable), thoroughly scrubbed with a surfactant, and triple rinsed with deionized water. More rigorous decontamination procedures may include rinsing equipment with an acid or solvent, followed by triple rinsing with deionized water. It is also a standard industry practice, when using non-dedicated sampling equipment, to sample from the least contaminated well to the most contaminated well.

Finding

Non-dedicated equipment used for sampling groundwater wells was not adequately decontaminated by Site Contractors between sample locations, and the progression of groundwater sampling was not conducted in accordance with standard industry and regulatory agency practices.

Discussion

Proper equipment decontamination prior to conducting groundwater sampling is critical to helping ensure that contamination of the sample from outside sources does not occur. Improper or incomplete decontamination of sampling equipment may result in cross contamination between monitoring wells. Analytical equipment sensitivity is such that even trace amounts of a contaminant on equipment surfaces may result in anomalous readings. Sampling equipment decontamination is fully described in several EPA Guidance Documents (GW-35 and 36) and is generally regarded by industry and regulatory agencies as a critical component in the collection of dependable, unqualified environmental samples.

Decontamination procedures were observed in the field during well sampling activities at monitoring wells RD-14 and RD-17. Between sampling locations, the following deficiencies were noted:

- The non-dedicated galvanized steel sampling and purging device was not disassembled for decontamination.
- This same device was not scrubbed with a nylon bristle brush using an alkanox solution.
- The device was sprayed with a fine mist of deionized water; however, this was not sufficient to meet the "triple rinse" method recommended by EPA.
- The device was not rinsed with a stream of organic solvent, such as methanol, and subsequently triple rinsed a second time with deionized water.

- The device was not wrapped in tin foil between sample locations to prevent contamination by outside sources during transport in the back of a truck.

Additionally, groundwater sampling was improperly conducted from the most contaminated well (RD-14) to the least contaminated (RD-17, RD-29, and RS-11) during that sampling event.

The responsible site personnel were unaware of these issues and the potential problems encountered with improperly decontaminated sampling equipment.

This issue was recognized in a general way in the SAN Self-Assessment (GW-25) through identifying the lack of a sitewide monitoring well standard operating procedure. The issue was not identified in the Site Contractor Self-Assessment (GW-24).

The causal factors for this finding appear to be a lack of Site Contractor personnel trained in best management groundwater sampling and decontamination protocols; inadequate Site Contractor, Site Office, and SAN appraisals/reviews of groundwater sampling activities; a lack of Site Contractor, Site Office, and SAN procedures which establish routine groundwater sampling and oversight training; and a lack of SAN resource allocation to provide technical hydrogeologic personnel to oversee groundwater sampling.

FINDING GW/BMPF-4: No Organic Vapor Monitoring During Groundwater Sampling

Performance Objective

EPA Guidance Documents (GW-37 and 38) and standard industry practice recommend that prior to conducting groundwater sampling from monitoring wells, the well head space should be monitored for the presence of organic vapors for the protection of field technicians. In the event that significant organic vapor concentrations are detected, continued breathing space monitoring should be conducted during the course of well purging and sample collection.

Finding

Organic vapor monitoring is not conducted prior to and during monitoring well purging and sampling activities, which is inconsistent with EPA Guidance Documents and standard industry and regulatory agency practice.

Discussion

The EPA, the Occupational Safety and Health Administration (OSHA), and the National Institute of Occupational Safety and Health (NIOSH) have developed standards for the safe conduct of field activities on hazardous waste sites. Among the guidelines for safe practice during field activities is the use of an organic vapor monitoring device or a photoionization detector, such as an HNu meter, for measuring the concentration of organic constituents in the air. It is a standard industry practice, and regulatory agency recommendation, that the head space (or open space at the top of a groundwater monitoring well) be monitored for the presence of organic vapors prior to purging or sampling the well. This practice accomplishes two health and safety goals for the sampling event: (1) it allows the technician to detect potentially high levels of organic contaminants in the well, thereby providing a "real-time" measure of organic concentrations, and (2) it provides the field personnel with information to determine whether an upgrade in personal protective equipment, such as respirators and protective clothing, is necessary. Without an organic vapor monitoring device, the field technician is unaware of the potential exposure received while conducting the sampling activities.

In discussions with facility personnel in an oversight capacity and the contractor responsible for groundwater sampling, they felt that levels of organic contaminants in the groundwater at SSFL do not warrant regular in-field vapor monitoring or upgrades in personal protective equipment (I-GW-5). It should be recognized, however, that through liquid-vapor partioning of organic chemicals, low concentrations in the groundwater may yield relatively high concentrations over time in the confined air space of the well. Upon opening the well, the technician may be exposed to high concentrations. It is important to continually monitor the breathing zone surrounding the worker when high levels of organic chemicals are detected in the well head space.

The facility was apparently unaware of this issue and it was not identified in either the SAN or Site Contractor Self-Assessments.

The causal factors for this finding appear to be human factors, in that although the personnel conducting and overseeing the sampling are trained in proper safety procedures, they are not implementing the procedures, and inadequate appraisals/reviews in that SAN and the Site Contractor have not previously recognized this problem.

3.5.5 Waste Management

3.5.5.1 Overview

The purpose of the waste management assessment was to evaluate the current status of the Site Contractor's hazardous, radioactive, and mixed (hazardous and radioactive) waste management practices with respect to Federal and State of California waste management regulations, DOE Orders, and the Site Contractor's policies and procedures; evaluate the waste management practices with respect to industry-accepted best management practices (BMPs); and evaluate the status of the Site Contractor's underground storage tanks with respect to Federal and State regulations, Site Contractor's policies and procedures, and industry-accepted BMPs.

The general approach to the waste management assessment included discussions with Site Contractor personnel; review of the Site Contractor documents, correspondence, and other records; and observations of the Site Contractor's facilities and activities. The information collected from these activities was evaluated with respect to applicable Federal and State of California regulations and DOE Orders, as identified in Table 3-6, and current industry BMPs.

DOE activities within Area IV of the SSFL generate hazardous, radioactive, and mixed wastes. The Site Contractor generates and stores hazardous wastes prior to shipping to offsite treatment/storage/disposal facilities (TSDFs). The site also operates a hazardous waste storage and treatment facility at the Hazardous Waste Treatment Facility, Buildings 133 and 029, and a radioactive waste treatment and storage facility at the Radioactive Material Disposal Facility (RMDF), Buildings 021, 022, 075, and 621.

The Site Contractor generates low-level radioactive waste during decontamination and decommissioning efforts of DOE facilities at Area IV. Some low-level radioactive waste results from environmental cleanup operations, such as the soil removal from the north slope of Building 064. The waste is often packaged at the site in large rectangular steel containers and transported to the RMDF via truck or forklift.

Radioactive waste is reduced in volume at the RMDF through size reduction and compaction for solid wastes, and evaporation for liquid wastes. Since some of the solid radioactive wastes are reduced in size at the RMDF, the containers are repackaged at this location. Liquid radioactive wastes are transported to the RMDF, via a portable tank carried by a fork lift, where the liquids are transferred to a holding tank from which they are pumped into the evaporator.

Generated mixed wastes are stored at the RMDF. The mixed wastes in storage include mercury, lead, non-halogenated solvents, oils, and electroplating solutions.

Nonhazardous, nonradioactive solid waste generated at SSFL, including that of Area IV, is collected and disposed of by a single contractor at the Bradley Landfill in Sun Valley, California. Solid waste consists of construction debris, packaging materials, containers, putresible wastes, and paper. Office white paper, scrap metals, lead acid batteries, waste oil, and aluminum cans are collected and recycled.

TABLE 3-6
LIST OF APPLICABLE WASTE MANAGEMENT REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Regulations	DOE
DOE 5400.3	Hazardous and Radioactive Mixed Waste Program	DOE
40 CFR 260-270	Hazardous Waste Regulations	EPA
22 CAC Chapter 30	Hazardous Waste Regulations	CA DHS
40 CFR 280	Underground Storage Tank Regulations	EPA
22 CAC Chapter 3 Subchapter 16	Underground Storage Tank Regulations	CA DHS

The Site Contractor's waste management program is generally strong and well managed. The Site Contractor has devoted increased attention to managing its hazardous waste over the past several years. The Site Contractor exercises central control over procedures for controlling, handling, storing, and disposal of hazardous waste to TSDFs. Policy requires periodic audits by the Site Contractor Environmental Control organization which administers the centralized control over waste activities.

With regard to underground storage tanks (USTs), DOE has 20 USTs in Area IV: 1 containing diesel oil, 5 containing radioactive materials, 12 containing hazardous materials, and 2 that are empty. All USTs containing hazardous materials or wastes are vaulted or constructed with double walls. The two empty tanks, and the one tank containing diesel oil, are single walled. The Site Contractor's UST program is well-managed; removals have been performed with proper oversight and remediation, underground tank leak tests have been performed as required, and records are maintained.

Four waste management findings were identified. These findings include two compliance findings and two BMP findings. Compliance findings address waste minimization and storage of land disposal restricted (LDR) wastes. The BMPs address characterization of hazardous wastes and sludge management.

3.5.5.2 Compliance Findings

FINDING WM/CF-1: Inadequate Waste Minimization Program

Performance Objective

DOE 5400.1 requires the preparation of a waste minimization program that contains goals for minimizing the volume and toxicity of all wastes that are generated, with annual reductions if programmatic requirements allow. Changes in waste quantity, volume, and toxicity that are achieved shall be compared with quantities generated in the previous year. The proposed waste minimization methods for treatment, storage, and disposal that are technically and economically practicable shall be reported as appropriate. Waste minimization plans required by specific legislation, such as RCRA, shall be included as part of the waste minimization plan. The plans should be reviewed annually and updated every 3 years. DOE 5400.3 and 5820.2A require similar plans for radioactive and mixed waste. The Site Contractor's Procedure EC 04.20 requires a detailed listing of waste minimization actions, responsibilities for these actions and specifies applicability to all Site Contractor facilities, including the DOE facilities managed by the Site Contractor.

Finding

The Site Contractor does not have an adequate waste minimization program that is in accordance with DOE 5400.1, 5400.3, and 5820.2A, and Site Contractor Procedure EC 04.20.

Discussion

The requirements for the Site Contractor to have a waste minimization program, including the need for specific waste minimization plans, have been developed by both DOE and the Site Contractor. Although some Site Contractor operations have considered waste minimization, and achieved isolation though meaningful reductions in generated wastes, most Site Contractor activities, including those under DOE contract, do not have formal waste minimization program or implemented waste minimization plans. Measures to evaluate all existing onsite processes and activities, document the evaluations, and implement appropriate waste minimization actions have not been conducted by the Site Contractor.

The Site Contractor was aware of these deficiencies as listed in the SAN Self-Assessment (WM-5) and Site Contractor Self-Assessment (WM-4).

The causal factors for this finding appear to be the lack of a complete Site Contractor procedure to implement DOE and Site Contractor waste minimization policy, a lack of Site Contractor training in the requirements of DOE 5400.1, and the lack of a Site Contractor procedure to train site personnel in the requirements for a waste minimization program and the need to adhere to DOE Order requirements.

FINDING WM/CF-2: **Storage of Land Disposal Restricted (LDR) Mixed Waste**

Performance Objective

40 CFR 268.50 prohibits the storage of restricted hazardous and mixed wastes for purposes other than to accumulate such quantities necessary to facilitate proper recovery, treatment, or disposal.

Finding

The Radioactive Material Disposal Facility (RMDF) is currently storing small quantities of restricted mixed wastes for purposes other than accumulating such quantities to facilitate proper recovery, treatment, or disposal, which is not in accordance with the requirements of 40 CFR 268.50.

Discussion

The RMDF stores radioactive and mixed waste generated by DOE activities within Area IV of the SSFL. Accumulated mixed wastes at RMDF which are currently restricted under the Land Disposal Restrictions include: 1.5 gallons of paint thinner (F listed solvent), 1 liter of liquid mercury, and 53 gallons of liquid electrolyte containing chrome. These wastes are not being stored for the purposes of accumulating such quantities as necessary to facilitate proper recovery, treatment or disposal. The Site Contractor is aware of the problem regarding accumulation and storage of mixed waste subject to LDR (WM-20). However, there are no facilities (DOE or commercial) which are permitted to accept the restricted mixed waste currently in storage in the RMDF for recovery, treatment or disposal. The mixed waste inventory at RMDF consists of materials that are not being generated at the present time and efforts are being directed toward ensuring that additional mixed waste are not generated (I-WM-16).

To address the issue of generation and storage of LDR mixed waste on a national level, DOE Headquarters, in December 1989, requested EPA to enter into Federal Facility Agreements (FFAs) with all DOE facilities that faced existing or future LDR compliance uncertainty. At several DOE facilities, DOE and EPA Regional offices are negotiating site-specific compliance agreements to resolve the issue of storage of mixed wastes. At the same time, DOE Headquarters and EPA Headquarters are continuing to address this issue at a nationwide level.

This finding was not listed in the SAN or Site Contractor's Self-Assessments (WM-5 and WM-4, respectively).

The causal factor for this finding appear to be the lack of available facilities permitted to treat and dispose of these wastes which poses a <u>barrier</u> towards complying with LDR regulations.

3.5.5.3 Best Management Practice Findings

FINDING WM/BMPF-1: Inadequate Hazardous Waste Verification

Performance Objective

Title 22 California Administrative Code (22 CAC) 67102 and 40 CFR 264.13 and 265.13 require thorough characterization of hazardous wastes prior to treatment, storage, or disposal. The owner or operator of a treatment/storage/disposal facility (TSDF) must develop a written waste analysis plan which describes the procedures that will be followed to obtain characterization information. Included in this plan is the frequency with which the initial analysis of the waste will be reviewed, or repeated, to help ensure that the analysis is accurate and up to date. As a best management practice, hazardous and mixed waste received at a TSDF should be periodically inspected to verify the contents as specified by the generator.

Finding

Site Contractor waste verifications of DOE hazardous and mixed waste shipped to the Area II Hazardous Waste Storage Area (HWSA) and the Area IV Radioactive Materials Disposal Facility (RMDF), respectively, are not conducted in accordance with best management practices.

Discussion

Two SSFL operations receive hazardous or mixed waste from DOE operations for treatment, storage, or further transport to TSDFs. Hazardous Waste characterization is performed by site generators.

The RMDF Operation, Building 022, receives radioactive waste and mixed waste from DOE operations at the SSFL and radioactive waste from Site Contractor operations at the DeSoto facility (see Special Issues, Chapter 7.1). Waste characterization information is received with the radioactive waste as classified by the generators. RMDF Operators do not routinely inspect nor evaluate the generator's waste characterizations, particularly where packaged containers are clamped, indicating they are full.

The Area II HWSA, Building 273, receives hazardous waste from the Site Contractor's satellite and 90-day accumulation areas for consolidation and shipment to TSDFs. Although characterization of these wastes is the responsibility of the generators, significant assistance is provided by the HWSA personnel in obtaining laboratory sample results. Periodic verifications of characterizations or resampling of wastes are not performed by the HWSA personnel.

The finding was included in the SAN Self-Assessment (WM-5) but was not covered in the Site Contractor Self-Assessment (WM-4).

The causal factors for the finding appear to be no Site Contractor <u>procedures</u> to periodically verify the generator's waste characterization at the RMDF and the Hazardous Waste Storage Facility prior to shipment offsite; the Site Contractor <u>procedure</u> to routinely train personnel on hazardous waste characterization requirements does not include reverification; and inadequate Site Contractor <u>training</u> in the need to periodically verify generator's waste.

FINDING WM/BMPF-2: Lack of Characterization of Sanitary Wastewater Treatment Plant Sludge

Performance Objective

In accordance with best management practices, a facility operating a sanitary wastewater treatment plant, which services operating units and storage units handling hazardous and radioactive chemicals and wastes, should prepare and follow procedures to help ensure sludge generated in the treatment process does not exhibit hazardous waste characteristics as defined by RCRA 40 CFR 261 Parts C and D.

Finding

Counter to best management practices, a hazardous waste determination on sludge from the Site Contractor's wastewater treatment plant (STP-3) which receives sanitary wastewater from DOE operations, has not been made.

Discussion

The Site Contractor's sanitary wastewater treatment plant (STP-3) at SSFL receives all DOE and Site Contractor sanitary wastewater from Area IV. Since radioactive and chemical wastewater can be generated from DOE activities within Area IV, there is a possibility that these materials can enter the sanitary sewer and the sanitary wastewater treatment plant, despite the Site Contractor's administrative controls over the discharge of these materials into the sanitary drain lines.

Although routine biological and radionuclide monitoring is performed on the sewage treatment plant's influent and effluent under the NPDES permit, only periodic analysis for organic chemicals is performed on these streams and only biological monitoring is performed on the sludge. Although there have been no significant concentrations of chemicals or radionuclides identified in the wastewaters, there is a possibility that contaminants could be concentrated in the sludge. The sludge has not been tested for RCRA hazardous waste characteristics prior to discharge to the Chino/Van Nuys Sanitary District.

This finding was not identified in either the SAN or Site Contractor's Self-Assessments (WM-4 and WM-5, respectively) but was discussed in the DOE Environmental Survey (WM-3).

The causal factors for this finding appear to be the lack of Site Contractor procedures to sample the sludge for hazardous waste; inadequate Site Contractor, Site Office, and SAN reviews/appraisals which did not identify the potential problem; and inadequate Site Contractor, Site Office, SAN, and DOE HQ EH QA/QC which did not track the identified problem to closure.

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3.5.6 Toxic and Chemical Materials

3.5.6.1 Overview

The purpose of the toxic and chemical materials (TCM) assessment was to evaluate the Site Contractor's compliance with the Toxic Substances Control Act (TSCA), Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), DOE, Orders, State of California regulations, Site Contractor policies and procedures, and best management practices related to DOE activities at the Santa Susana Field Laboratories (SSFL). Table 3-7 lists the regulations that apply to toxic and chemical materials management of DOE activities at SSFL.

The TCM assessment was accomplished through discussions with Site Contractor personnel; a review of internal written policies, procedures, and programs; a review of the Hazardous Materials Business Plan; a review of internal documents related to PCB and asbestos management; and tours of the chemical storage areas.

From review of the Site Contractor and SAN Self-Assessments (TCM-1 and 2, respectively), it is apparent that much progress has been made with respect hazardous materials management. Overall chemical storage was good; however, there were some instances of improper chemical segregation and container/cabinet labeling and marking.

By late 1987, all PCB transformers owned by the Site Contractor had been replaced or retrofilled with non-PCB dielectric fluid. There have been shipments of PCB items since that time: PCB-contaminated capacitors, which were located during decontamination and decommissioning activities, and PCB-contaminated trichloroethane and laboratory samples.

In late 1989 the Site Contractor discontinued the application of an unrestricted herbicide by site personnel. All pesticides, applied both inside buildings and in outdoor areas at the SSFL, are applied by an outside contractor certified by the State of California. Pesticides are not stored onsite. The contractor brings types and amounts of pesticides needed for each application, and any unused pesticides and empty containers are removed from the site by the contractor when the application is complete.

The chemical procurement process is controlled by a required review and approval by the Site Contractor Health, Safety and Environment Department (HS&E) (TCM-17). The Account Assignment Department will not assign an account number without an HS&E approval signature (I-TCM-22, and 23). Material Safety Data Sheets are automatically requested with each purchase requisition and are distributed to the Chemical User Department by the HS&E Department. The addition of required approval by the Environmental Control and Energy Conservation Group would add another safeguard to ensure that each chemical purchase is evaluated on the basis of ultimate disposal requirements and its potential impact on the environment.

Storage of bulk chemicals and petroleum products in aboveground storage tanks and other containers is addressed in the Surface Water section of this report (see section 3.5.3), including secondary containment and release response.

TABLE 3-7
LIST OF APPLICABLE TOXIC AND CHEMICAL MATERIALS
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
40 CFR 761	Polychlorinated Biphenyls (PCBs) Manufacturing, Processing, Distribution in Commerce, and Use Prohibitions	EPA
Federal Register, Vol. 54, No. 244 December 21, 1989	Polychlorinated Biphenyls; Notification and Manifesting for PCB Waste Activities; Final Rule	EPA
29 CFR 1910.1200	Hazard Communication	OSHA
8 CAC 5194	Hazard Communication	Cal/OSHA

Maintenance of chemical inventories is addressed in the Inactive Waste Sites section of the report (see section 3.5.9) as part of the review of compliance activities related to SARA Title III and the California Hazardous Materials Release Response Plans and Inventory requirements.

The TCM portion of the Tiger Team Assessment identified one compliance finding and one best management practice finding. The compliance finding is related to posting of hazard warnings, and the best management practice finding is related to storage of incompatible chemicals.

3.5.6.2 Compliance Findings

FINDING TCM/CF-1: Incomplete Hazard Identification

Performance Objective

29 CFR 1910.1200(f)(5) states that the employer shall ensure that each container (including bags, barrels, bottles, cans, cylinders, drums, reaction vessels, storage tanks, etc.) of hazardous chemicals in the workplace is labeled, tagged, or marked with the identity of the hazardous chemical(s) contained and appropriate hazard warnings.

29 CFR 1910.1200(c) states that "hazardous chemical" means any chemical that is a physical hazard or a health hazard. The term health hazard includes chemicals that are carcinogens. The term physical hazard includes combustible liquids, compressed gases, explosives, flammables, organic peroxides, oxidizers, pyrophorics, reactives and water-reactives.

The California Hazardous Substances Information and Training Act of 1980, as implemented by 8 CAC 5194, requires Cal/OSHA to enforce hazard communication standards which parallel the Federal standards.

Site Contractor Operating Policy M-514 and Site Contractor Health, Safety & Environment (HS&E) Procedure E-03 require that hazardous materials be stored in appropriately labeled containers. Hazardous materials have essentially the same definition in M-514 and HS&E Procedure E-03 as that for hazardous chemicals in 29 CFR 1910.1200(c).

Additionally, according to best management practice, hazards associated with chemicals stored in cabinets should be posted on the outside of the cabinets.

Finding

Several hazardous chemical storage containers, including tanks and drums, were not marked with hazard warnings in accordance with OSHA and Cal/OSHA hazard communication requirements and Site Contractor operating policies and procedures, and hazard warnings were not posted on some chemical storage cabinets as required by best management practices.

Discussion

Hazardous materials are managed by the Site Contractor in various types of containers at the SSFL. During inspections of 12 areas associated with DOE activities, drums and tanks were observed that were not marked with hazard warnings in accordance with hazard communications standards 29 CFR 1910.1200 and 8 CAC 5194, Site Contractor Operating Policy M-514 and HS&E Procedure E-03. Examples of incomplete hazard warnings are provided below:

- One denatured ethanol tank and six drums at the Component Handling and Cleaning Facility, Building 463, were not identified as containing flammable liquids nor was the specific type of alcohol identified. Hazard warnings were affixed to the drums under their drums covers; however, this would not satisfy the need for the hazard to be immediately visible to persons in the area.

- One drum of friable asbestos-containing material was not marked with the asbestos warning.

- Concentrated caustic and sulfuric acid tanks in the Water Treating Area at the Sodium Components Test Installation were not identified as containing corrosive materials.

- A propane tank outside Building 013 was not identified as containing a flammable gas.

Additionally, counter to best management practices, two cabinets at Buildings 065 and 360 which contained incompatible chemicals, were not posted with hazard warnings associated with the chemicals stored, and one of the two cabinets was not identified as a chemical storage cabinet.

The fact that hazard warnings are not posted on some tanks is addressed in the Site Contractor and the SAN Self-Assessments (TCM-1 and TCM-2, respectively). The lack of hazard warnings on drums and cabinets was not addressed in either self-assessment.

The causal factor for this finding appears to be inadequate Site Contractor training in existing Site Contractor hazardous chemical handling procedures and regulatory requirements; no Site Contractor procedure to follow best management practices related to marking of chemical storage cabinets; inadequate SAN, Site Office, and Site Contractor appraisals and reviews, in that the issues have only been partially identified; and inadequate SAN and Site Office QA/QC, in that the issues identified in the past had not been followed up to ensure problem resolution.

3.5.6.3 Best Management Practice Findings

FINDING TCM/BMPF-1: Storage of Incompatible Chemicals

Performance Objective

According to best management practice, incompatible chemicals should not be stored in common cabinets due to the potential for reactions resulting in physical hazards, health hazards, and/or release of hazardous materials to the environment. Additionally, incompatible chemicals should not be stored within a common containment area.

Finding

Counter to best management practice, incompatible chemicals are being stored together in chemical cabinets at Buildings 065 and 360 and on a pallet within a common containment area in Building 360.

Discussion

Chemical storage was inspected at 12 areas associated with DOE activities. Incompatible chemicals were stored in cabinets in Buildings 065 and 360. Additionally, incompatible chemicals were stored together on a pallet in Building 360.

In the Chemistry Lab, Building 065, Picric Acid, identified on the label as "wet, with not less than 10 percent water," is being stored with the toxic metal salts sodium arsenite, potassium ferricyanide, and cuprous cyanide. Picric acid in this quantity (approximately 4 pounds), when hydrated with 10 percent water as indicated on the label, is considered a Flammable Solid as defined in 49 CFR 173.150. Picric acid is especially reactive with metals or metallic salts, including those stored in this cabinet.

In the Sodium Component Test Installation, Chemical Storage Building (Building 360), incompatible liquid chemicals were stored within the same cabinet. These include acids, bases, and combustible liquids. This same group of incompatible chemicals were stored together on a pallet in the building.

Instances of storage of incompatible chemicals within a common containment area were identified in both the Site Contractor and the SAN Self-Assessments (TCM-1 and TCM-2, respectively).

The causal factors for this finding appear to be inadequate Site Contractor procedures in that none of the Site Contractor's procedures specifically address the incompatible chemical mixtures identified in the finding; inadequate training in that the Site Contractor Health, Safety and Environment Department was not contacted, as required in Site Contractor Operating Policy M-514, prior to initiating these storage practices; and inadequate SAN, Site Office, and Site Contractor QA/QC in that storage of incompatible chemicals was identified in the past and had not been followed up to ensure problem resolution.

3.5.7 Quality Assurance

3.5.7.1 Overview

The purpose of the quality assurance (QA) portion of the Tiger Team Assessment was to evaluate the Site Contractor QA Program and its application to the generation of sound, verifiable, and traceable chemical and radiological data. Table 3-8 lists specific regulations and guidelines used to evaluate the Site Contractor during the assignment.

The scope of this review included discussions and interviews with Site Contractor staff; a review of QA policies and procedures, analytical and sampling methods, and laboratory records; and an evaluation of QA practices against data quality objectives at the Environmental Analytical Laboratory and the Radiation Measurements Laboratory. In addition, the QA assessment included a review of environmental protection plans and programs.

As a part of the QA assessment, reviews were coordinated with other team members to ensure that all potential environmental quality assurance issues were evaluated. The Air, Radiation, Surface Water, and Hydrogeology specialists were consulted with regard to the quality assurance aspects of their emission/effluent monitoring investigations.

Environmental inorganic and organic monitoring and analytical work for the Site Contractor is done by the Site Contractor Environmental Analytical Laboratory (B-300) and the Site Contractor Radiation Measurements Laboratory (B-100). In addition, contract laboratories are used extensively for compliance analysis when onsite labs are not certified for a particular analysis, the number of samples exceeds the capacity of the lab, and for analysis of samples collected by contractors.

The Site Contractor Analytical Chemistry Laboratory is certified by the State of California for analyses of some NPDES and hazardous waste parameters. The laboratory has established an internal quality assurance/quality control (QA/QC) program based on EPA guidelines. It provides on-the-job training for new personnel and when new procedures are implemented. The QC program includes the use of internal and external standards, spikes, duplicates, blanks, and QC charts, and participates in EPA laboratory assessment programs. A computer tracking system flags unacceptable results, which are then evaluated to determine cause and corrective action is taken. Written procedures are in place for sampling, chain-of custody, and sample storage. Additionally, the laboratory is responsible for quality assurance oversight of contract laboratories.

The Radiation Measurements Laboratory monitors radioactivity in onsite and offsite samples of ambient air, surface and groundwater, and soil. The laboratory also receives and verifies results of vendor radiological analyses. A written QA plan, implemented by several procedures, for the radiological program is available.

There are four compliance findings in the QA section related to QA oversight of laboratory operations and procedures, and two best management practice findings concerning the environmental monitoring plan.

TABLE 3-8
LIST OF APPLICABLE QUALITY ASSURANCE REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Program Requirements	DOE
DOE 5700.6B	Quality Assurance	DOE
SAN MD 5700.6b	Quality Assurance	DOE
NQA-1-1989	Quality Assurance Program Requirement For Nuclear Facilities	DOE
SW-846	Test Methods for Evaluating Solid Waste, Physical/Chemical Methods SW846, Third Edition	EPA
QAM 005/80	Interim Guidelines and Specifications for Preparing Quality Assurance Project Plans	EPA
40 CFR 136	Guidelines Establishing Test Procedures for the Analysis of Pollutants	EPA

3.5.7.2 Compliance Findings

FINDING QA/CF-1: Deficient Quality Control of Vendor Analytical Laboratories

Performance Objective

DOE 5400.1, Chapter IV, General Environmental Protection Programs, Environmental Monitoring Requirements, states "A quality assurance program consistent with DOE 5700.6B shall be established covering each element of environmental monitoring and surveillance programs commensurate with its nature and complexity."

DOE 5700.6B, Quality Assurance, establishes DOE policy on quality assurance. Section 7a of this Order states that "plans and actions to assure quality achievement in Departmental programs shall be established, implemented, and maintained."

DOE SAN MD 5700.6B, Quality Assurance, Section 7.e.1 states that SAN's contractor organizations "shall develop, implement, and maintain quality assurance and reliability programs responsive to DOE 5700.6B and this directive."

DOE 5700.6B requires application of national consensus standards of quality assurance where suitable standards are available. In the nuclear area, ANSI/ASME NQA-1 is the DOE preferred standard for quality assurance and has been accepted by the Site Contractor as the quality standard for DOE operations. NQA-1 states that quality assurance requirements for nuclear facilities requires control of procurement of services by means of source evaluation and selection, evaluation of objective evidence of quality furnished by the supplier, source inspection, audit, and examination of items and services upon delivery or completion.

Finding

The Environmental Analytical Laboratory is not conducting vendor laboratory environmental data reviews, does not routinely assess vendor laboratories environmental data and quality assurance programs as required by NQA-1, and has no contractual mechanism to do so.

Discussion

The Site Contractor's vendor laboratories provide DOE with organic and inorganic analytical services for many of DOE's air, groundwater, and surface water environmental samples (I-QA-21). Quality assurance monitoring of vendor laboratories is the responsibility of the Environmental Analytical Laboratory. However, environmental data generated by vendor laboratories is not subject to routine QA/QC review (I-QA-15 and 21). Additionally, contractual agreements with the vendor laboratories do not include provisions for routine review of the vendor laboratories internal analytical quality controls and procedures (QA-31 and 32). The Site Contractor's procedure for periodic supplier reviews does not address audits of vendor laboratories' internal and external control procedures (QA-1, Procedure R5.1).

The SAN and Site Contractor's Self-Assessments (QA-6 and QA-10, respectively) did not identify this finding.

The causal factors for this finding appear to be inadequate Site Contractor quality assurance procedures which do not reference the Environmental Analytical Laboratory operations (QA-1, Procedure R5.1); Rocketdyne and Environmental Analytical Laboratory procedures which do not address quality assurance for vendor laboratories (QA-34); Rocketdyne, Environmental Analytical Laboratory, Site Office, and SAN reviews/appraisals which did not identify the noted deficiencies; inadequate Site Contractor training of QA/QC personnel in the requirements of DOE QA/QC Orders; and no Site Contractor or SAN procedures requiring routine training of all personnel directly and indirectly linked to quality control of analytical results.

FINDING QA/CF-2: **Conflict of Interest Between Site Contractor QA/QC Coordinator and Environmental Analytical Lab Manager**

Performance Objective

DOE 5700.6B requires application of national consensus standards of quality assurance where suitable standards are available. In the nuclear area, ANSI/ASME NQA-1 is the DOE preferred standard for quality assurance and has been accepted by the Site Contractor as the quality standard for DOE operations. ANSI/ASME NQA-1 basic requirements for quality assurance organization state that persons responsible for assuring that activities affecting quality have been correctly performed "shall have direct access to responsible management at a level where appropriate action can be effected. Such persons or organizations shall report to a management level such that required authority and organizational freedom are provided, including sufficient independence from cost and schedule considerations."

Finding

QA/QC for the Site Contractor's Environmental Analytical Laboratory is not managed in accordance with provisions of NQA-1 in that the Laboratory QA/QC Coordinator and the Laboratory Manager share QA/QC responsibilities.

Discussion

The Site Contractor's Environmental Analytical Laboratory (B-300) is responsible for the analysis of DOE environmental samples and for monitoring data quality for DOE environmental samples analyzed onsite and at vendor laboratories. The Site Contractor's QA organization plan shows the Laboratory QA/QC Coordinator reporting to the Laboratory Manager (QA-11), effecting shared QA/QC responsibilities by the QA/QC Coordinator and the Lab Manager (I-QA-4). The Site Contractor's QA organization plan provides no independent QA/QC assessment of the Environmental Analytical Laboratory's activities.

The SAN and Site Contractor Self-Assessments (QA-6 and QA-10, respectively) did not address this issue. The Site Contractor is aware of this issue (I-QA-14 and 23) and has formulated plans to provide QA oversight by means of an administrative reorganization.

The causal factors for this finding appear to be deficient Site Contractor procedures which do not include independent QA/QC oversight of the Analytical Laboratory (QA-1, R15.1 and 15.2), and Site Contractor appraisals/reviews which have not identified this finding in the self-assessment process.

FINDING QA/CF-3: **Handling of Corrections to Data and Records Archiving**

Performance Objective

DOE 5700.6B requires application of national consensus standards of quality assurance where suitable standards are available. In the nuclear area, ANSI/ASME NQA-1 is the DOE preferred standard for quality assurance and has been accepted by the Site Contractor as the quality standard for DOE operations. NQA-1 states that analytical laboratories shall ensure that all corrected data are signed and dated by the person authorized to make the correction, and collected data shall be archived to prevent damage to the data.

Finding

Environmental data corrections are not routinely signed and dated at the Site Contractor's Environmental Analytical Laboratory (B-300) and the Radiation Measurements Laboratory. Radiation survey data corrections are not routinely signed and dated at the Site Contractor's Radioactive Materials Disposal Facility; and records are not archived in accordance with NQA-1 requirements.

Discussion

DOE environmental samples are collected for analysis by the Site Contractor's chemical and radionuclide laboratories, and radiation surveys of equipment surfaces are conducted at the Site Contractor's Radioactive Materials Disposal Facility (RMDF). A review of analytical data at the Site Contractor's Environmental Analytical Laboratory (B-300), Radiation Measurements Laboratory (B-100), and Radioactive Materials Disposal Facility (B-044) showed that data that had been corrected were not always signed and dated in accordance with the requirements of NQA-1.

In addition to the noted data correction deficiencies, some data records in the Site Contractor's Environmental Analytical Laboratory archives, Building 319, had been damaged by water leakage into that building.

The SAN and Site Contractor Self-Assessments did not identify these deficiencies (QA-6 and QA-10, respectively).

The causal factors for this finding appear to include the Site Contractor's lack of <u>procedures</u> on data corrections and archiving of records to follow NQA-1 requirements, lack of Site Contractor <u>training</u> in the requirements of NQA-1, and SAN and Site Contractor <u>reviews/appraisals</u> which did not identify the problems.

FINDING QA/CF-4: **Lack of a Formal Pollution Prevention Awareness Program Plan**

Performance Objective

DOE 5400.1 requires that the head of each Field Organization prepare a Pollution Prevention Awareness Program Plan to implement specified programmatic requirements that include incentives, awards, and pollution prevention awareness programs in all mission statements and project plans, where appropriate. Completion of the Pollution Prevention Awareness Program Plan was required on or before November 9, 1989.

Finding

The Pollution Prevention Awareness Program Plan has not been written, and the informal pollution prevention activities conducted by the Site Contractor do not include incentive and award programs, nor do mission statements and project plans include pollution prevention requirements, as required by DOE 5400.1.

Discussion

The Pollution Prevention Awareness Program Plan for DOE activities conducted at the SSFL has not been written. There are no incentive or award programs, and no pollution prevention awareness requirements noted in mission statements and project plans (I-IWS-16). However, it should be noted that the Site Contractor has conducted pollution prevention awareness training for facility staff through a series of awareness programs and employee training seminars.

The SAN and Site Contractor Self-Assessments (IWS-12 and IWS-35, respectively) identified the lack of a written Pollution Prevention Awareness Program Plan; however, they did not identify deficiencies in the scope of the Site Contractor's pollution prevention awareness activities.

The causal factors for this finding appear to be the lack of Site Contractor <u>resources</u> to develop and implement a complete Pollution Prevention Awareness Program Plan, and inadequate <u>appraisals/reviews</u> by SAN and the Site Contractor, which partially identified the problem.

3.5.7.3 Best Management Practice Findings

FINDING QA/BMPF-1: Inadequate Environmental Monitoring Program

Performance Objective

DOE 5400.1, Chapter IV states, "A written environmental monitoring plan shall be prepared for each site, facility, or process that uses, generates, releases, or manages significant pollutants or hazardous materials. The plans shall contain the rationale and design criteria for the monitoring program, extent and frequency of monitoring and measurement, procedures for laboratory analyses, quality assurance requirements, program implementation procedures, and direction for the preparation and disposition of reports." Additionally, the Order specifies requirements for meteorological monitoring, radiological monitoring, non-radiological monitoring, and groundwater monitoring. All requirements specified in Chapter IV of DOE 5400.1 are required to be implemented no later than November 9, 1991.

As a best management practice facilities undergoing extensive multimedia environmental monitoring should have developed an environmental monitoring plan and implemented environmental monitoring programs as specified by DOE 5400.1, Chapter IV, which formally establishes siting and sampling rationale.

Finding

The Site Contractor has not developed a comprehensive environmental monitoring plan and implemented environmental monitoring programs as specified by DOE 5400.1 to aid in the proper characterization of environmental releases as required by best management practice.

Discussion

Significant environmental monitoring activities are routinely conducted to assess the environmental impacts of activities conducted by the Site Contractor under contract to DOE. Both radiological and chemical environmental monitoring are performed for groundwater, surface water, and air. This environmental monitoring, however, is conducted by the Site Contractor without a comprehensive environmental monitoring plan. No formal siting and sampling rationale are documented for ongoing environmental monitoring activities (I-RAD-21 and 22).

The Site Contractor prepared and submitted elements of an environmental monitoring plan and environmental monitoring programs to SAN to meet the requirements of DOE 5400.1. However, not all of the required elements were included and those elements that were included have not been approved by SAN (I-RAD-21 and 22).

This finding was identified by the SAN and Site Contractor Self-Assessments (QA-6 and QA-10, respectively).

The causal factors for this finding appear to be inadequate Site Contractor <u>QA/QC</u> in that this deficiency was identified by SAN and was not sufficiently followed up in a timely manner to ensure resolution of this issue, and insufficient SAN resources were allocated to the Site Contractor to develop and implement an adequate environmental monitoring plan/programs.

FINDING QA/BMPF-2: Environmental Protection Implementation Plan Approval

Performance Objective

DOE 5400.1 requires that each field organization prepare an Environmental Protection Implementation Plan (EPIP) for implementing the requirements of the Order. The purpose of the EPIP is to provide management direction, including assignment of responsibilities and authorities, to ensure that all DOE facilities are operated and managed in a manner that will protect, maintain, and, where necessary, restore environmental quality, minimize potential threats to the environment and public health, and comply with environmental regulations and DOE policies. EPIPs were required to be prepared no later than November 9, 1989, and approved by the appropriate Program Senior Official (PSO). Best management practice requires that Implementation Plans be approved by the appropriate PSO in a timely manner.

Finding

The Environmental Protection Implementation Plan has not been approved in a timely manner as required by best management practice.

Discussion

The Environmental Protection Implementation Plan was initially developed and submitted by the Site Contractor to SAN in March 1990, and subsequently revised and resubmitted in January 1991 (IWS-16). The EPIP has not yet been approved by Nuclear DOE's Office of Energy (NE).

The SAN and Site Contractor Self-Assessments (IWS-12 and IWS-35, respectively) identified the lack of PSO approval of the EPIP.

The causal factors for this finding appear to be QA/QC in that deficiencies in the EPIP were known by SAN but were not sufficiently followed to ensure resolution, and inadequate appraisals/reviews by NE to ensure proper and timely development of the Implementation Plan.

3.5.8 Radiation

3.5.8.1 Overview

The purpose of the radiation portion of the Tiger Team Assessment for DOE activities within Area IV of SSFL was to evaluate the Site Contractor's dose assessment methodologies and environmental radiation protection activities. These areas were assessed to determine compliance with applicable Federal regulations, DOE Orders, and Site Contractor policies and procedures. The programs were also reviewed against commonly accepted industry performance standards.

The general approach to the radiation assessment included a site document review of the environmental monitoring program, dose calculation methodologies, radiological procedures, and contingency plan for transuranic waste. Interviews with Site Contractor personnel, and field observations of current environmental radiation protection practices, were also conducted during this assessment. In addition, reviews with other team specialists were coordinated to ensure that all potential environmental radiation issues were evaluated in sufficient detail.

The regulations and requirements that were used in the radiological portion of the Tiger Team Assessment are listed in Table 3-9.

The two Site Contractor departments that have responsibility over radioactive materials are Nuclear Operations, and Radiation Protection and Health Physics Services. Nuclear Operations responsibilities include radioactive and mixed waste handling, storage, and shipment. Radiation Protection and Health Physics Services responsibilities include environmental monitoring and dose assessment, and health physics support for decontamination and decommissioning efforts.

During the 1950's and 1960's, the Site Contractor conducted research and development on many DOE nuclear reactor systems and subsystems, including the Sodium Reactor Experiment (1957-1964) and Space Nuclear Auxiliary Power (SNAP) series of compact liquid metal nuclear reactors (1957-1973). During the peak of nuclear activity, approximately 100 million curies existed within Area IV (R-51). However, current estimates of radioactive material onsite are less than 100 curies (R-51). Onsite nuclear reactor development and testing was later discontinued, and the Site Contractor began a program of radioactive decontamination and decommissioning (D&D) on selected DOE operations. The major operational nuclear installation within Area IV is the Radioactive Material Disposal Facility (RMDF). The RMDF was used for storage of irradiated fuel, but is currently used for packaging radioactive wastes generated as a result of Area IV D&D operations. A review of the Site Contractor's Annual Environmental Monitoring Reports (R-20 through R-35) revealed that the Site Contractor's estimated dose to the public resulting from DOE activities has historically been significantly below the allowable limits.

The Radioactive Materials Disposal Facility is the primary source of current radionuclide releases. Other current release points within Area IV are the D&D operations at the Rockwell International Hot Laboratory (B-020) and the SNAP-8 Test Facility (B-059). The emission release rates reported by the Site

TABLE 3-9
LIST OF APPLICABLE RADIATION
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
DOE 5400.1	General Environmental Protection Plan	DOE
DOE 5400.4	Comprehensive Environmental Response, Compensation, and Liability Act Program	DOE
DOE 5400.5	Radiation Protection of the Public and the Environment	DOE
DOE 5400.xy (Draft)	Radiological Effluent Monitoring and Environmental Surveillance	DOE
DOE 5482.1B	Environmental, Safety and Health Appraisal Program	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 5500.3A	Emergency Planning	DOE
DOE 5820.2A	Radioactive Waste Management	DOE
10 CFR 20	Standards for Protection Against Radiation	NRC
40 CFR 60 Appendix A	Standards of Performance for the Stationary Services - Test Methods	EPA
40 CFR 61	National Emission Standards for Hazardous Air Pollutants	EPA
40 CFR 141	Safe Drinking Water Act	EPA
DOE/EH-0070	External Dose-Rate Conversion Factors for Calculation of Dose to the Public	DOE
DOE/EH-0071	Internal Dose Conversion Factors for Calculation of Dose to the Public	DOE

TABLE 3-9 (Continued)
LIST OF APPLICABLE RADIATION
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
PNL 6577/UC-610	A Guide to Reducing Radiation Exposure to As Low As Reasonably Achievable	DOE
ANSI N13.1-1969	American National Standard Guide to Sampling Airborne Radioactive Materials in Nuclear Facilities	ANSI

Contractor are significantly below regulatory and DOE limits for air emissions (R-35). Radiological dose assessments are performed by the Site Contractor to determine the offsite consequences of DOE site programs and activities. The dose assessments are conducted to demonstrate compliance with DOE 5400.5, "Radiation Protection of the Public and the Environment," and the release limits and dose standards in other DOE and Federal requirements such as 40 CFR 61, "National Emission Standards for Hazardous Air Pollutants."

Historical routine environmental surveillance by the Site Contractor within Area IV included sampling of biota, surface water, soil, ambient air, and groundwater. Current routine environmental surveillance only includes ambient air. Monitoring of stack emissions for radioactivity at Buildings 059 and 020 are also routinely conducted.

Some radiation issues identified by the Tiger Team Assessment were also identified in the Site Contractor and SAN Self-Assessments (R-37 and R-52, respectively).

The radiation portion of the Tiger Team Assessment identified three compliance findings and one best management practice finding. The compliance findings address deficient dose assessment practices, lack of a quality environmental surveillance program, and lack of a contingency plan for transuranic waste. The best management practice finding addresses the lack of procedures to survey waste packages for removable contamination.

Based on the Self-Assessments and Tiger Team Assessment, Site Contractor staff members are now aware of the significant deficiencies in the current program and are beginning to strengthen areas needing improvement.

3.5.8.2 Compliance Findings

FINDING RAD/CF-1: AIRDOS-PC Modeling Deficiencies

Performance Objective

DOE 5400.5 states that the dose limit to the public must be evaluated considering all exposure modes from all DOE activities including remedial actions. According to DOE 5400.1, the public dose component that is attributable to airborne releases of radioactivity must comply with the Clean Air Act standards set forth in Title 40 CFR 61, Subpart H, and be monitored according to 40 CFR 60, Appendix A, ANSI N13.1-1969, and DOE 5400.xy (Draft). Title 40 CFR 61.93, Subpart H, requires that compliance with the Clean Air Act Standards be demonstrated using AIRDOS-PC or other EPA approved models or procedures. DOE 5400.xy (Draft), Chapter IV, Section 3(d)(2), states that Gaussian models or other EPA-approved straight line models used to demonstrate compliance with 40 CFR 61.93 should use an additional dose assessment to realistically account for temporal and spatial variations in atmospheric conditions and release rates. In DOE 5400.5, Chapter II, Section 6(c), it is stated that if available data are not sufficient to evaluate factors germane to dose, or if they are too costly to determine, the assumed parametric values must be sufficiently conservative such that it would be unlikely for individuals to actually receive a dose that would exceed the dose calculated using the values assumed.

Finding

Some assumptions and data used in the EPA AIRDOS-PC model by Site Contractor personnel are not conservative in that not all emission sources are included in the model and the radioactive emission release rates and meteorological data used in the model are not in accordance with DOE 5400.5.

Discussion

DOE requires the estimating of radiological dose to the public using an appropriate model for the site location, which relies upon providing accurate meteorological data and accurate values of radioactive particulate releases to the atmosphere. The discussion that follows presents those parameters for which model input data were not conservative.

<u>Airborne Emissions</u>

The current sampling design and technology used to develop data for calculating doses to the public has been in place since 1970 (see Finding A/CF-1). Detectable radioactive airborne releases from the decontamination and decommissioning of Building 059 have not been included in AIRDOS-PC calculations (R-50). The requirement to monitor all radionuclide emission rates from point sources, including those from remedial actions, is found in 40 CFR 61.93(b) and DOE 5400.5. Also, the design of the sampling system that is used to detect radioactive particulate releases from Building 059 does not meet the guidelines of ANSI N13.1-1969 (see Finding A/CF-1).

Stack Sampling

By assessing the emission of radioactive particulates, and hence, total radioactivity released, the AIRDOS-PC model is used to estimate the radiation dose to the public. The design of the stack emission sampling systems for the Radioactive Material Disposal Facility (RMDF), Building 020, and Building 059 do not meet the requirements of 40 CFR 61, and ANSI N13.1-1969 (see Finding A/CF-1). Since the sampling design does not meet the requirements of ANSI N13.1-1969, the radioactive particulate emission release rates that are supplied to the model by the Site Contractor are determined from air filter samples which are collected in a manner that may not be representative of actual emissions (see Finding A/CF-1). The changing and handling practice, as observed by the Tiger Team, of the filter samples collected for radioactivity at the RMDF, Building 059, and Building 020 stack emission points revealed that loss of some particulate matter may occur (see Finding A/CF-1).

Meteorological Data

The meteorological data used in the model by the Site Contractor do not reflect the meteorological conditions that exist at the site, which is a requirement of DOE 5400.5, Chapter II, Section 6.b(1), and DOE 5400.xy (Draft). The noted deficiencies in the meteorological data used in the model by the Site Contractor are as follows:

- Atmospheric data supplied to the model by the Site Contractor were generated at the Burbank Airport which possesses substantial differences in topography and elevation compared to the Contractor's site. (The use of these data for the Site Contractor was suggested by EPA.)

- A height to the "cap" of the mixing layer (air inversion) in which all residents reside was estimated by the Site Contractor as 9,000 meters (30,000 feet). South Coast Air Quality Management District reports the annual average afternoon height of the inversion as approximately 900 meters (3,000 feet) in the region in which the Contractor's site is located (I-RAD-23).

- The height to the "cap" of the mixing layer (inversion) in which the nearest residents reside was estimated by the Site Contractor as 9,000 meters (30,000 feet). Since the nearest residents reside at approximately the same elevation as the Contractor's site (1800 feet), the height to the "cap" is approximately 366 meters (1,200 feet) for these individuals.

It should be noted that radionuclide releases resulting from DOE activities in Area IV of the Santa Susana Field Laboratory are now limited to cleanup activities and that the current doses to the public attributed to these activities is viewed by the Site Contractor and the Environmental Subteam to be well below the regulatory effective dose limit to the public of 10 millirem per year, even when the noted deficiencies are included in the EPA AIRDOS-PC model. However, additional work will be required to define the actual value of the effective dose.

This finding was partially identified in the Site Contractor and SAN Self-Assessments. The portion that was identified in the assessments was the inadequacy of the main stack monitoring [SAN Assessment of ETEC, Finding II.1(a), Site Contractor Self-Assessment, Finding 2.2.1.12(26)].

The apparent causal factors for the finding are <u>human factors</u> in that regulatory and DOE guidance were not rigorously followed and inadequate Site Contractor, SAN, and Site Office <u>appraisals/reviews</u> which did not fully identify this finding.

FINDING RAD/CF-2: **Lack of Supporting Data to Modify Routine Environmental Surveillance**

Performance Objective

DOE 5400.1, Chapter IV, Section 5(b)(1), states that "environmental surveillance shall be conducted to monitor the effects, if any, of DOE activities on onsite and offsite environmental and natural resources." DOE 5400.xy (Draft) states that the criteria to perform environmental surveillance monitoring should be based on the projected dose equivalent to a member of the public or to the population. It also states that environmental monitoring and surveillance may be necessary for legal, public relations, and state/local commitments.

Finding

The Site Contractor modified routine environmental surveillance for radioactivity without demonstrating to SAN that the criteria requiring an environmental surveillance program, as presented in DOE 5400.xy (Draft), no longer applies to the site.

Discussion

The Site Contractor modified routine environmental vegetation sampling in 1985, offsite soil and surface water sampling in 1989, and reduced ambient air samplers from eight to five in 1989. The Site Contractor notified the Nuclear Regulatory Commission (NRC), California Department of Health Services, and SAN by letter dated February 9, 1990 (R-43), that routine environmental sampling would be discontinued in 1990 for surface water and soil but did not present supporting data demonstrating that there was no longer a need for environmental surveillance as required in DOE 5400.xy (Draft). In the letter to the agencies, the Site Contractor based the decision upon "a major reduction in nuclear and radiological operations at SSFL, recognizing that there has been no significant dispersable radioactive material in the RIHL (Building 020)...since 1987" (R-43). The letter continued by stating that environmental sampling would be conducted as needed in conjunction with decommissioning efforts. No elaboration was provided in the letter on what criteria would be used to evaluate the need for environmental sampling.

The NRC responded to the Site Contractor (R-44) releasing them from routine environmental surveillance responsibilities associated with the license issued by the NRC. In March of 1990, SAN responded to the Site Contractor's letter stating that routine environmental sampling should not be discontinued. A meeting to discuss the matter occurred in February 1991. The matter still has not been resolved and routine environmental sampling has not been conducted since the program was eliminated.

The SAN and Site Contractor Self-Assessments (R-52 and R-37, respectively) did identify this finding.

The causal factor for this finding appears to be inadequate DOE-Headquarters EH training of the Site Contractor and Site Office personnel in the requirements of DOE 5400.xy (Draft), and lack of DOE-Headquarters procedures which establish a training program on DOE 5400.5 and 5400.xy (Draft). An additional causal factor for this finding appears to be inadequate Site

Contractor procedures establishing a routine training program on environmental surveillance and the need to comply with DOE 5400.1, 5400.5, and 5400.xy (Draft). This includes SAN's inadequate QA/QC in that the problem is not being followed up to ensure problem resolution.

FINDING RAD/CF-3: **No Contingency Plan for Transuranic Waste Storage**

Performance Objective

DOE 5820.2A requires that facilities storing transuranic (TRU) waste shall have a contingency plan designed to minimize the adverse impacts of fire, explosion, or accidental release of hazardous components of the waste to the environment.

Finding

The Site Contractor's contingency plan does not address the storage of transuranic waste at the Radioactive Material Disposal Facility (RMDF).

Discussion

The Site Contractor currently possesses 12 drums of transuranic waste that were packaged onsite in 1988 under the guidance of, and certified by, the Idaho National Engineering Laboratory. This transuranic waste, which is stored at RMDF Building 075, was generated during a unique cleanup operation and no further transuranic waste is expected to be generated. The Facility Contingency Plan does not address the storage of TRU waste.

The SAN and Site Contractor Self-Assessments did not identify this finding (R-52 and R-37, respectively).

The apparent causal factors for this finding appear to be that the Site Contractor procedure does not fully implement the contingency plan requirements as specified in DOE 5820.2A, and appraisals and reviews in that previous audits and self-assessments have not identified this finding.

3.5.8.3 Best Management Practice Finding

FINDING RAD/BMPF-1: No Consistent Contamination Surveys on Packages

Performance Objective

49 CFR 173.443 states that the level of removable radioactive contamination on the external surfaces of each package offered for shipment must be as low as practicable, and also sufficient measurements shall be taken in the most appropriate locations to yield a representative assessment of the removable contamination levels.

Finding

Site Contractor personnel are not performing wipe tests on radioactive waste containers in a consistent and prescribed fashion in accordance with 49 CFR 173.443.

Discussion

Packages and waste shipments containing radioactive materials are prepared by the Site Contractor. Prior to shipment, wipe tests are performed; however, the area covered by the wipe tests and the number of wipe tests performed on the packages vary according to the judgment of the technician preparing the shipment. The Site Contractor has not specified a minimum number of wipe tests per surface area or provided guidance on where they should be obtained on package surfaces.

The SAN Self-Assessment (R-52) did not identify this finding. The Site Contractor Self-Assessment (R-37) identified this finding, but it was inadvertently omitted in the report.

The causal factor for this finding appears to be that a formal Site Contractor <u>procedure</u> has not been developed to create a level of consistency in wipe tests.

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3.5.9 Inactive Waste Sites

3.5.9.1 Overview

The inactive waste sites portion of the Tiger Team Assessment evaluated the conduct and management of studies for the cleanup of DOE and DOE-related inactive waste sites located within Area IV of the SSFL. Additionally, the Assessment evaluated the DOE facility's compliance status with Federal, State of California, Ventura County, and DOE requirements concerning inactive waste sites and the provisions of the Emergency Planning and Community Right-to-Know standards of the Superfund Amendments and Reauthorization Act (SARA Title III) and equivalent state standards.

The general approach to the Assessment included interviews with the staff of SAN and Site Office, the Site Contractor's management and staff, and EPA Region IX. The review also included an extensive review of the SARA Title III and environmental investigation documents, review of past operations photographs, and onsite physical surveys of DOE and DOE related operations areas and inactive sites within Area IV of the SSFL. The requirements by which DOE's inactive waste sites were evaluated are listed in Table 3-10.

Overall administration of the inactive waste site programs is carried out by DOE and the Site Contractor's management and staff. The Site Contractor contracts much of its soil and groundwater investigation work to private consultants. Removal activities involving decontamination and decommissioning (D&D) within Area IV are being conducted by the Site Contractor. These include B-059 and B-020 with plans for the D&D of the Radioactive Materials Disposal Facility (RMDF) and other sites (e.g., B-64, B-05, B-23, B-12). Furthermore, there have been initial chemical removal/remedial activities at the old Conservation Yard and the former Sodium Disposal Facility (B-886), and, under DOE approval, extensive removal/remediation activities at former radioactive facilities (e.g., SRE, B-09, B-28).

The Site Contractor has conducted initial screening and investigative work to identify inactive waste sites from DOE operations in Area IV through the Phase I and II investigations conducted in 1986 and 1987, respectively. The Site Contractor also had a CERCLA Preliminary Survey and Site Investigation conducted in 1988, and a DOE HQ Environmental Survey in 1988 (IWS-34) which identified inactive waste sites not included in previous surveys (e.g., ESADA, Southeast Drum Storage Area, and new Conservation Yard).

Under the Resource Conservation and Recovery Act's (RCRA) corrective action provision, Section 3004(u), a RCRA Facility Assessment (RFA) Visual Site Inspection (VSI) was conducted at the SSFL by EPA, including Area IV. As a result of this inspection, there were 11 Solid Waste Management Units identified that are associated with current or former DOE operations, with additional Areas of Concern being cited. The public comment period for the RFA report will extend through mid April, after which a Remedial Facility Investigation will be conducted for the SSFL followed by Corrective Measures Study. Additionally, pursuant to the Toxic Pits Cleanup Act, the site is under a separate action by the Regional Water Quality Control Board (RWQCB) for the cleanup of the lower pond associated with the former Sodium Disposal Facility (B-886). The Site Contractor submitted to the RWQCB a Hydrogeological Assessment Report to define the hydrogeological regime in the area which was approved by the RWQCB.

TABLE 3-10
LIST OF APPLICABLE INACTIVE WASTE SITES AND RELEASES
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
CERCLA/SARA	Section 103-Notices, Penalties	EPA
CERCLA/SARA	Section 120-Federal Facilities	EPA
29 CFR 1910	Part 1910.120 Occupational Safety and Health Standards	OSHA
40 CFR 264	RCRA Subpart F, Corrective Action	EPA
40 CFR 300	National Oil and Hazardous Substances Contingency Plan (NCP)	EPA
40 CFR 302	Designation, Reportable Quantities, and Notification	EPA
40 CFR 355	Emergency Planning and Notification	EPA
40 CFR 370	Hazardous Chemical Reporting: Community Right-To-Know Act	EPA
40 CFR 372	Toxic Chemical Release Reporting	EPA
DOE 5400.1	General Environmental Management Program	DOE
DOE 5400.4	CERCLA Requirements	DOE
DOE 5484.1	Environmental Protection, Safety, and Health Protection Information Reporting Requirements	DOE
DOE 5500.2A	Emergency Notification, Reporting and Response Levels	DOE

TABLE 3-10 (Continued)
LIST OF APPLICABLE INACTIVE WASTE SITES AND RELEASES
REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Sections/Title	Authority
OSWER Directive 9345.0-01	Preliminary Assessment Guidance FY 1988	EPA
OSWER Directive 9345.1-02	Expanded Site Inspection Transitional Guidance for FY 1988	EPA
OSWER Directive 9355.3-01	Guidance for Conducting Remedial Investigations and Feasibility Studies Under CERCLA	EPA
California Health and Safety Code, Chapter 6.95, Division 19	Hazardous Materials Business Plan	California Office of Emergency Services
California Health and Safety Code, Chapter 6.8, Division 20	Section 25319.5/Preliminary Endangerment Assessment	CA DHS

The Hazard Ranking System (HRS) score was completed for the identified DOE inactive waste sites in 1987 and the scores fell in the 7-8 range, which is well below the EPA threshold for inclusion on the National Priority List. EPA is currently having the Site Contractor supply additional data for HRS scoring relative to air migration pathways.

The Site Contractor stores and uses hazardous substances at DOE facilities within Area IV in excess of the threshold planning quantities (i.e., sulfuric acid and chlorine) and has submitted required notifications and hazardous material inventories in accordance with the emergency planning requirements of the Emergency Planning and Community Right-to-Know Act of 1986 (EPCRA), also known as SARA Title III, and the California State Equivalent Program.

To meet California statutes, the Site Contractor has developed a Hazardous Materials Business Plan, which includes a Hazardous Materials Inventory, Spill Prevention Control and Countermeasures Plan, and other emergency response data. The plan includes a list of materials used, maximum and annual quantities, location, and physical/chemical characteristics of the hazardous materials onsite. The plan was developed jointly by the Contractor's Health and Safety staff as well as environmental groups working with site management.

The inactive waste sites portion of the Tiger Team Assessment identified three compliance findings. The compliance findings relate to problems associated with the development of the Business Plan and other EPCRA standards, issues involving the implementation of DOE 5400.4 on CERCLA compliance, including no comprehensive integrated inactive waste site program, and a finding relating to internal notification of emergency response organizations and the fact that the procedure is not implemented as designed.

3.5.9.2 Compliance Findings

FINDING IWS/CF-1: Inadequate Inactive Waste Site Corrective Action

Performance Objective

DOE 5400.4, Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA), effective October 5, 1989, states that it is the policy of DOE to respond to releases of hazardous substances at facilities under DOE jurisdiction in accordance with the provisions of CERCLA, as amended, as well as those of the National Contingency Plan (NCP) and Executive Order 12580. DOE responses shall include both removal and/or remedial actions as appropriate, to reduce adverse impacts on public health and the environment from releases, regardless of whether the facility is listed on the National Priority List (NPL). DOE 5400.4 additionally states that DOE will enter into Interagency Agreements and/or Federal Facility Agreements at both NPL and non NPL sites, as appropriate, for the execution of remedial investigations/feasibility studies and remedial actions under the requirements prescribed in DOE 5400.2A, Environmental Compliance Issue Coordination, and under Section 120(e) of CERCLA. Furthermore, DOE 5400.4 indicates that where corrective actions are carried out under other authorities, such as Sections 3004(u) and 3008(h) of RCRA or state laws, these corrective actions must not be inconsistent with the NCP. Best management practice requires that Solid Waste Management Units (SWMUs) be cleaned up in a timely fashion.

Finding

Most aspects of the Site Contractor's site investigations and cleanup activities at the Rockwell International Hot Laboratory (RIHL), the former Space Nuclear Auxiliary Power (SNAP) reactor facility (B 059A), and the old Conservation Yard, and site investigations at the former Sodium Disposal Facility, the B-100 Trench, the Hazardous Waste Treatment Facility T-133, the B-056 Landfill, and the north slope of the Radioactive Materials Disposal Facility (RMDF) Leachfields, are not in conformance with DOE 5400.4. In addition, DOE's SWMUs at SSFL that have been identified as being a primary concern, and which are not undergoing any current cleanup activity (the former Sodium Disposal Facility (B-886), the B-100 Trench, the north slope area of the RMDF Leachfields, and soil adjacent to the RIHL), have not been cleaned up in a timely fashion in accordance with best management practices.

Discussion

DOE operations are conducted within Area IV of the SSFL site. Although Area IV is not on the NPL, it does have 11 identified SWMUs. The Site Contractor's efforts for the identification, characterization, and remediation of inactive waste sites have not recognized or addressed many of the administrative and technical issues related to site investigations and remedial activities (e.g., development of a Site Contractor Management Strategy, establishment of a sitewide work plan, establishment of data quality objectives, and establishment of a formal community relations plan). Some of the SWMUs and areas of concern noted in the RCRA Visual Site Inspection have undergone or are undergoing cleanup actions (RIHL, B-059, and the old Conservation Yard), but these actions have not been, or are not being, performed in a comprehensive, coordinated manner as required by the NCP.

At the RIHL (B-020) and former SNAP Reactor Building (B-059), the site is conducting decontamination and decommissioning (D&D) operations under DOE contract. The RIHL was formerly used for the decladding of irradiated fuel for reprocessing. At the former SNAP Reactor Building (B-059A), there is cobalt 60 contamination in the basement where groundwater had entered prior to the installation of a groundwater pump system to prevent the infiltration of groundwater. With the exception of the health and safety plans for the decontamination and decommissioning of the former radioactive operations, neither of these facilities have undergone activities in accordance with the NCP including those examples discussed under the NCP compliance deficiencies paragraph below.

During 1990, the Old Conservation Yard had four rolloff boxes of radioactively contaminated soil removed. In addition, 100 cubic yards of soil contaminated with hydrocarbons were exhumed. The soil was contaminated by the leaking of underground diesel fuel piping. The EPA requested the Site Contractor to discontinue any further chemical cleanup actions until the California Department of Health Services (CA DHS) had approved a cleanup work plan. According to Site Contractor personnel, the work plan was submitted for review by CA DHS staff prior to initiating work, but the work plan has not yet been approved. Examples of other deficiencies are identified below:

- There is no Site Management Strategy Plan to facilitate integrated planning and management of site activities.

- There is no data quality objective that dictates the conduct of site investigations by specifying the data needed to support decisions regarding removal or remedial response activities.

- There are no work plans which have been established in accordance with the NCP for the conduct of site investigations. The site does not have sampling and analysis plans for directing its investigations (Quality Assurance Program Plans and Field Sampling Plans).

- Health and safety plans have not been developed for directing the safe conduct of chemical investigations, but the site has developed health and safety plans for the decontamination and decommissioning of its former radioactive operations.

- Formal community relations plans, as defined by the NCP, have not been developed, though the site has an active community relations program.

- There has been little activity on the part of the DOE or Site Contractor personnel to develop a comprehensive, organized strategy for dealing with the potential of multiple cleanups of SWMUs under competing agency (EPA, CA DHS, Regional Water Quality Control Board [RWQCB]) standards (IWS-18, and 20). For example, the RWQCB is requiring remediation for the former Sodium Disposal Facility (B-886) ponds under its California Toxic Ponds Cleanup Act while EPA is conducting RCRA corrective action on all of SSFL, including Area IV SWMUs.

In addition to the three SWMUs mentioned above which have undergone cleanup activities, there are four other SWMUs which are undergoing or have undergone investigation or removal activities but have not been cleaned up in a timely fashion. These include the former Sodium Disposal Facility (B-886), B-100 Trench, soil adjacent to the RIHL, and the north slope of the RMDF Leachfields. These sites have been shown to be the sites of primary concern based on past soil and groundwater surveys (IWS-20, 23, 24, 28 and 36). DOE is currently reviewing a work plan for the B-100 Trench.

This finding was partially identified by the SAN Self-Assessment (IWS-15) but not in the Site Contractor Self-Assessment (IWS-35).

The apparent causal factors for this finding are lack of Site Contractor, Site Office, and SAN personnel training in the implementation of DOE 5400.4; inadequate Site Contractor procedures requiring routine training relative to this Order; ineffective Site Contractor, SAN, and Site Office appraisals/reviews in that the issues were not totally identified; and DOE-EM and SAN's inadequate allocation of resources to implement such a comprehensive, coordinated program.

FINDING IWS/CF-2: Hazardous Materials Business Plan Reporting Inadequacies

Performance Objective

The California Health and Safety Code (CHSC), Section 25503.5 requires that any business which handles a hazardous material or a mixture containing a hazardous material which exceeds its minimum threshold planning quantity must establish and implement a Hazardous Materials Business Plan for responding to emergencies involving a release of a hazardous material. The Business Plan incorporates the reporting requirements of the Emergency Planning and Community Right-to-Know Act (EPCRA), including the requirement for an annual hazardous material inventory and updating of the plan when there are changes in hazardous materials use. Additionally, CHSC Section 25533 requires that a business which handles acutely hazardous materials above the threshold planning quantity must file a registration with the administering agency (Ventura County Fire Department).

Finding

The Site Contractor's Hazardous Materials Business Plan has incorrectly reported the annual and maximum quantities for some hazardous materials used at the SSFL, has not submitted an amended hazardous materials inventory form when new chemicals have been introduced in the work place, and has not registered the SSFL with the Ventura County Fire Department as an acutely hazardous materials handler, in accordance with the California regulations.

Discussion

The Site Contractor's 1990 Hazardous Materials Business Plan for SSFL (including DOE facilities managed by the Site Contractor under contract to DOE) was submitted to the administering agency on January 1, 1990 (IWS-7). Two subsequent submittals were also sent to the administering agency on February 11, 1991, and March 19, 1991, for materials which had been inadvertently omitted from the original submittal (hazardous and radioactive wastes). A review of these documents, along with interviews of SSFL staff, identified several deficiencies in the Hazardous Materials Business Plan, as follows:

- The Hazardous Materials Business Plan does not accurately reflect quantities of chemicals stored and used onsite. There are many entries where the annual quantity of the chemical is noted to be zero, while the maximum quantity noted is greater than zero (e.g., the Sodium Component Test Installation where the maximum quantity of hydrazine is listed as 25 gallons, and the annual quantity used is 0; and at the Radioactive Materials Disposal Facility (B-621) where a cobalt 60 source is listed at a maximum quantity of 0.0006366 curies and the annual quantity noted is 0).

- The Business Plan does not accurately reflect the actual use and management of hazardous materials at the Hazardous Waste Management Facility (T-133). The plan indicates that the Hazardous Waste Management Facility manages three grades of sodium hydroxide when, in fact, the facility produces and stores only one grade, which is a by-product of its treatment operation.

- The Site Contractor has not submitted a revised inventory form to the Local Emergency Planning Committee within 30 days of bringing in a new chemical or changing the status of an existing chemical (I-IWS-13).

- The facility has not submitted an acutely hazardous materials registration form. The registration form submission, required by California law, was due January 1, 1988.

The issues associated with MSDSs and registration as an acutely hazardous materials user were previously identified in the SAN and Site Contractor Self-Assessments (IWS-12 and IWS-35, respectively). The Business Plan inaccuracies relative to hazardous materials usage and inventory were not identified in either of the Self-Assessments.

The apparent causal factors contributing to this finding include no Site Contractor procedures for developing a hazardous materials inventory, no routine training on the requirements of the CHSC, inadequate Site Contractor QA/QC to assess the quality of information submitted to the CHSC, and no Site Contractor procedures for routine training in the EPCRA and California Business Plan requirements.

FINDING IWS/CF-3: **Incomplete Internal Reporting Procedure**

Performance Objective

The ETEC Environmental Control Manual (Publication 572-Z) Procedure EC 06.00, the Rocketdyne Operating Policy M-501, and the Master Emergency Plan state that all discharges of pollutants within SSFL are to be immediately reported to the Industrial Security Control Center, which in turn passes on information to the appropriate organization (Environmental, Health and Safety, Medical, etc.).

Finding

The Site Contractor's Industrial Security Control Center was not contacted during 6 of 8 known environmental spill events that occurred during the period January 1, 1990, through February 1991 which is not in accordance with the Environmental Control Manual, Operations Procedures, and the Master Emergency Plan.

Discussion

In reviewing the monthly activity sheets (contact logs) at the Industrial Security Control Center (IWS-6), and comparing these logs with known spill reports (IWS-5) supplied by staff of the environmental unit, it was determined that the Industrial Security Control Center was not contacted regarding all spills which occurred during the selected review period of January 1, 1990, through February 1991. During this review period, it was noted that there were eight chemical spill incidents (IWS-5) which should have been reported to the Industrial Security Control Center (IWS-5). The Industrial Security Control Center records indicate that they had been contacted twice during this period regarding environmental incidents (IWS-6). A subsequent followup review of internal records by the Industrial Security Control Center confirmed that they had not been contacted during 6 of 8 events.

Neither the SAN nor the Site Contractor Self-Assessments (IWS-12 and IWS-35, respectively) noted this deficiency.

The causal factors contributing to this finding appear to be inadequate training of Site Contractor personnel in the implementation of the Site Contractor and SAN procedures established for reporting of incidents; inadequate Site Contractor procedures requiring routine training in adhering to established environmental release reporting requirements; and inadequate Site Contractor and SAN appraisals/reviews since they did not identify this deficiency.

3.5.10 National Environmental Policy Act (NEPA)

3.5.10.1 Overview

The purpose of the NEPA portion of the environmental assessment was to: (1) evaluate compliance with the NEPA, Council on Environmental Quality (CEQ) regulations, and DOE NEPA Guidelines, Orders, and Memoranda; (2) evaluate NEPA management structure and NEPA review processes; and (3) identify inappropriate and inadequate NEPA procedures and documentation. Table 3-11 lists the applicable regulations and requirements used to evaluate NEPA compliance.

The scope of this assessment included interviews with staff and management responsible for NEPA compliance at Rockwell, the DOE Site Office (Site Office), SAN, and the NE and EM Program Offices; a review of Rockwell's, SAN's, and the Program Offices' NEPA guidance and review procedures; and a review of the adequacy of available Rockwell NEPA determinations and documentation [categorical exclusions (CXs), memoranda-to-file (MTFs), and action description memoranda (ADMs)] prepared for NEPA compliance related to ongoing and proposed activities managed under the Rockwell ETEC contract.

All Rockwell DOE activities managed under the Rockwell ETEC contract require NEPA review and determination, including General Plant Projects (GPPs), Engineering Work Requests, Field Work Proposals (FWPs), Work for Others, and routine maintenance.

Although DOE NEPA requirements have been in place since 1980, the application of NEPA to DOE site activities has been recent; CXs and MTFs date only from June 1989. There are no Environmental Assessments (EAs) or Environmental Impact Statements (EISs) for DOE activities managed under the Rockwell ETEC contract. Rockwell raised the issue of a sitewide NEPA document (N-5), and a Rockwell memorandum (N-4) indicated that the NE NEPA Compliance Officer (NCO) considered that current Rockwell efforts [i.e., CXs, MTFs, and ADMs] are satisfactory in identifying the environmental impact from ongoing operations and facility modifications. Rockwell procedures for the implementation of NEPA are recent; the earliest is dated November 20, 1989, after receiving guidance from DOE.

A Site Office was reestablished in December 1990. The Site Office acts as the central point for all NEPA documentation of DOE activities managed under the Rockwell ETEC contract, and has the responsibility of channeling NEPA documents to SAN for review and processing. All recommendations for NEPA determinations are required to be transmitted by SAN to DOE HQ for signature by the Program Secretarial Officers as appropriate. Responsibility for supporting DOE NEPA activities managed under the Rockwell ETEC contract is assigned to the Rockwell Environmental, Safety, and Health (ES&H) Coordinator.

The NEPA portion of the Tiger Team Assessment identified five compliance findings. These findings relate to: the inadequacy of written NEPA procedures; the lack of NEPA in early project planning; lacking and inappropriate NEPA determinations; incomplete recordkeeping and tracking; and inadequate NEPA review of proposed actions. Three of the five NEPA findings (CF-1, CF-2, and CF-5) were not identified in the Site Contractor Self-Assessment or the SAN Self-Assessment for DOE activities managed under the Rockwell ETEC contract. NEPA finding CF-3 and was partially addressed in

TABLE 3-11
LIST OF APPLICABLE NATIONAL ENVIRONMENTAL POLICY ACT REGULATIONS/REQUIREMENTS/GUIDELINES

Regulations/ Requirements/ Guidelines	Section/Title	Authority
P.L. 91-190 (January 1, 1970) as amended	National Environmental Policy Act (NEPA)	U.S. Congress
40 CFR 1500-1508	Regulations for Implementing the Procedural Requirements of NEPA	Council on Environmental Quality (CEQ)
10 CFR 1021	Compliance with the National Environmental Policy Act	DOE
DOE 5440.1C (April 9, 1985)	National Environmental Policy Act	DOE
DOE 5440.1D (February 22, 1991)	National Environmental Policy Act	DOE
DOE 4700.1 (March 6, 1987)	Project Management System	DOE
DOE 5400.4 (October 2, 1989)	Comprehensive Environmental Response, Compensation, and Liability Act Requirements	DOE
52 FR 47662-47670 (December 15, 1987), 55 FR 37174-37179 (September 7, 1990)	DOE Compliance with the National Environmental Policy Act (NEPA); Amendments to the DOE NEPA Guidelines	DOE
SEN-15-90, February 5, 1990	Secretary of Energy Notice - NEPA	DOE
----	Interim Procedural Guidance for Implementation of SEN-15-90. (March 2, 1990); September 20, 1990	DOE

the SAN Self-Assessment for DOE activities managed under the Rockwell ETEC contract, but was not identified in the Site Contractor Self-Assessment. Finding NEPA CF-4 was identified in the SAN Self-Assessment for DOE activities managed under the Rockwell ETEC contract and partially addressed in the Site Contractor Self-Assessment.

3.5.10.2 Compliance Findings

FINDING NEPA/CF-1: Lack of Adequate and Integrated NEPA Procedures

Performance Objective

SEN-15-90, DOE 5440.1D [7.a.(2), 7.b.(8), 7.c.(3), and 7.d.(4)], DOE 4700.1, the DOE NEPA Guidelines (52 FR 47662), and the Interim Procedural Guidance for Implementation of SEN-15-90 each establish various requirements and guidance for compliance with NEPA and CEQ regulations. DOE 5400.4 establishes the requirement to integrate NEPA and CERCLA. In addition, DOE 5440.1D requires the Secretarial Officers [7.a.(2)] and Operations Office Managers [7.b.(8)] to ensure consistency in agency-wide application of NEPA.

Finding

Rockwell's, the Site Office's, SAN's, and the Program Offices' NEPA implementing procedures are either lacking, or are not consistent with DOE NEPA requirements. In addition, the existing procedures do not ensure consistency of document flow and responsibilities in the agency-wide application of NEPA in accordance with DOE 5440.1D.

Discussion

Rockwell's and the Site Office's NEPA implementing procedures are either lacking or are not consistent with DOE requirements, and all existing NEPA procedures [i.e., Rockwell's, the Site Office's, SAN's, and the Program Offices (ER, NE, and EM)] are inconsistent with one another. Because the existing SAN MD 5440.1B (N-77) is not consistent with DOE Orders, SAN has prepared draft NEPA implementing procedures, SAN MD 5440.1C (N-17), to address the deficiencies. Rockwell's NEPA implementing procedures inappropriately infer that Rockwell makes NEPA determinations (N-61), and that only certain activities require NEPA documentation (N-16) which is inconsistent with DOE requirements. In addition, existing Rockwell and SAN NEPA procedures (N-61 and N-77) do not address the integration of CERCLA and RCRA pursuant to DOE 5400.4 and other environmental regulations, such as California Environmental Quality Act (CEQA), pursuant to CEQ regulations.

The existing NEPA procedures for Rockwell, SAN, and Program Offices are not integrated with each other to help ensure that document flow and responsibilities (Rockwell, SAN, and Program Offices) throughout DOE (Rockwell, Site Office, SAN, and Program Offices) do not overlap. Although SAN has prepared a draft MD 5440.1C (N-17) which is consistent with the DOE requirements, it is still not integrated with Rockwell and Program Office procedures. Therefore, the document flow and destination from Rockwell through each successive office (Rockwell, Site Office, SAN, and Program Offices) is not clear (N-14, N-16, N-61). In addition, responsibility for processing the document is undefined which contributes to document tracking inefficiencies and project delays (see Finding NEPA/CF-4).

This finding was not identified in either the Site Contractor Self-Assessment or the SAN Self-Assessment (N-15 and N-20, respectively) for DOE activities managed under the Rockwell ETEC contract. The Site Office is preparing NEPA procedures and ETEC is aware of the inadequacies in their procedures.

The apparent causal factors contributing to this finding are a lack of a DOE EH <u>policy</u> to develop a consolidated procedure, a lack of a Rockwell <u>policy</u> to implement NEPA, inadequate <u>resources</u> committed to the implementation of NEPA procedures by SAN and the Program Offices, and <u>human factors</u> in that the SAN NEPA Compliance Officer (NCO) is not effectively implementing DOE NEPA requirements.

FINDING NEPA/CF-2: **Inadequate NEPA Reviews and Milestones for the Budget Review Process**

Performance Objective

CEQ regulations (40 CFR 1501.2), DOE NEPA Guidelines (52 FR 47662), and DOE 5440.1D require early NEPA review of proposed actions. SEN-15-90 (Section I.D) requires that NEPA milestones be incorporated into project planning documents and that the internal budget review process include a NEPA status report. Rockwell's recent Rocketdyne Environmental Control Manual (Section V.H) (N-16) requires Rockwell to provide SAN with the NEPA status of projects and actions in the internal budget review process.

Finding

Field Work Proposals (FWPs) do not reflect early NEPA review and status of proposed actions in accordance with Rockwell's procedures and DOE requirements. FWPs and SAN's Activity Data Sheets (ADSs) do not include NEPA milestones in accordance with Rockwell's procedures and DOE requirements.

Discussion

Rockwell's 1992 FWPs, submitted in response to SAN's Field Budget Call (N-57), do not reflect early NEPA review of proposed projects including milestones and budgetary requirements. Neither the FWPs nor SAN's ADSs [submitted in response to the FY 1993-1997 Five-Year Plan (N-58)] give milestones for the NEPA process. Only 1 of SAN's 31 ADSs included NEPA milestones (see Finding NEPA/CF-3). Interviews showed that the SAN office, the Site Office (I-N-3 and I-N-12) and Rockwell personnel (I-N-6 and I-N-10) were not aware of these requirements.

This finding was not identified in the Site Contractor Self-Assessment or the SAN Self-Assessment (N-15 and N-20, respectively) for DOE activities managed under the Rockwell ETEC contract.

The apparent causal factors for this finding appear to be a lack of formal training of Rockwell and SAN personnel in DOE and Federal NEPA requirements; inadequate SAN, Site Office, and Site Contractor appraisals/reviews of DOE NEPA activities managed under the Rockwell ETEC contract; and Rockwell, the Site Office, and SAN have no procedures for routine training of personnel responsible for implementation of NEPA requirements.

FINDING NEPA/CF-3: Lacking and Inappropriate NEPA Determinations

Performance Objective

SEN-15-90, DOE 5440.1D, and the Interim Procedural Guidance for Implementation of SEN-15-90 require that a Secretarial Officer or, if designated, an operations office manager make determinations early on for proposed actions covered by Section D of the DOE NEPA Guidelines (52 FR 47662). (NEPA determinations for proposed actions not covered in Section D are made by EH-1 or the Secretary.)

Finding

Determinations are lacking for Rockwell activities managed under the Rockwell ETEC contract. Inappropriate NEPA determinations are being made by SAN and the Site Office after actions are initiated, and unauthorized determinations are being made by both Rockwell and SAN which are not in accordance with the applicable DOE Order, Notice, and guidelines.

Discussion

A lack of and inappropriate determinations were identified based on a review of DOE's 16 NEPA determinations [13 categorical exclusions (some of which cover multiple activities) and 3 memoranda-to-file (MTF)], 1 Atomics International MTF, Action Description Memoranda, examination of Rockwell's records, and interviews with Rockwell, Site Office, and SAN personnel who prepare or review NEPA documentation. Some activities have no determinations NEPA determinations, other activities were initiated prior to determination, and other activities have unauthorized determinations. Each of these is discussed below.

<u>Lack of NEPA Determinations</u>

Interviews (I-N-10, I-N-16, and I-N-17) show that projects [e.g., General Plant Projects (GPPs), maintenance, project design, and paper studies] are being undertaken without NEPA documentation. These activities are being made by Rockwell personnel without any NEPA documentation and review by DOE. For all proposed and ongoing projects at Rockwell (including over 4,000 routine maintenance projects, approximately 31 projects listed on Activity Data Sheets (ADSs), approximately 27 Field Work Proposals for 1992, and approximately 11 General Plant Projects per year), only 16 NEPA determinations have been documented from June 1989 to the present. Because there are no DOE NEPA documents that predate June 1989, there are no DOE NEPA determinations for the activities.

In addition to the above concerns, there is no DOE NEPA determination for the decontamination and decommissioning of the Building 020 Hot Cell. The Nuclear Regulatory Commission (NRC) document titled "Environmental Impact Appraisal for the Assessment of Operations at Atomics International Under Special Nuclear Materials License No. SNM-21" (N-7) is the sole NEPA documentation for this activity. DOE has not adopted the NRC EA and issued a DOE Finding of No Significant Impact (FONSI), therefore, this activity is being conducted without an approved by a DOE NEPA document.

Determinations Made After Actions Are Initiated

A document review showed that DOE managed under the Rockwell ETEC contract have been initiated without NEPA determinations. ADSs for FY 1993-1997 (N-58) show the NEPA status for 31 proposed projects. Milestone start dates on these ADSs indicate that 11 projects have been initiated without NEPA determinations.

Unauthorized Determinations

Unauthorized NEPA determinations have been made by SAN. The authority for Section D NEPA determinations rests with NE and EM Secretarial Officers, whereas for ER, it has been delegated to SAN. Of the 16 CX NEPA determinations that were available for review, the signatory for 13 was appropriate, and the documentation upon which these determinations were based was adequate in form and content. However, for three of these CXs (N-67, N-73, and N-79), an unauthorized determination was made by the Program Manager, Engineering and Facilities Management Division, SAN; the Site Office Manager; or the SAN NEPA Compliance Officer; respectively, without delegated authority.

This finding was not identified in the Site Contractor Self-Assessment (N-15) and was partially identified in the SAN Self-Assessment (N-20) for DOE activities managed under the Rockwell ETEC contract. SAN recognized that DOE activities managed under the Rockwell ETEC contract have taken place without NEPA determinations.

The causal factors for this finding are lack of formal training for Rockwell, Site Office, and SAN on NEPA requirements by Site Office, SAN, and DOE EH; inadequate appraisals/reviews of the NEPA implementation process and determinations by the Site Office, SAN, and Program Offices; and in adequate procedures by Rockwell on the NEPA implementation process (N-14, N-16, and N-61), and final procedures by the Site Office (I-N-23) and SAN to implement existing DOE HQ policy (see Finding NEPA/CF-1).

FINDING NEPA/CF-4: Incomplete NEPA Recordkeeping and Tracking

Performance Objective

DOE NEPA 5440.1C requires Responsible Supervisory Officials to establish identifiable records. DOE NEPA 5440.1D requires Secretarial Officers and Operations Office Managers to approve recordkeeping requirements. The draft NEPA SAN MD 5440.1C and the Site Contractor ETEC Procedure 1-20, Revision B (Environmental Protection Program) require recordkeeping by the Site Contractor. Best management practices require centralized recordkeeping and integrated tracking procedures for Rockwell, Site Office, SAN, Program Office, and EH to follow the status of NEPA review and determinations.

Finding

Identifiable records and recordkeeping required by DOE 5440.1C, 5440.1D, the interim SAN MD 5440.1C, and Rockwell's ETEC Procedure 1-20, Revision B, are incomplete for DOE activities managed under the Rockwell ETEC contract. There is also no centralized recordkeeping or integrated tracking system at the Site Office or SAN in accordance with best management practices.

Discussion

Even though Rockwell has its own recordkeeping requirements, they are not being implemented. Rockwell's records are incomplete for NEPA review and recommendations to DOE for ongoing and proposed actions (I-N-6, I-N-16, and I-N-17). Although the Site Contractor, Site Office, and SAN (I-N-6) are cognizant of best management practices for recordkeeping, there are no centralized NEPA files maintained in any of these offices.

In addition, best management practices for an integrated tracking system do not exist at Rockwell, the Site Office, SAN, and the Program Offices. Thus, Rockwell and DOE project managers often do not know when NEPA determinations are in place (I-N-16) and, therefore, when projects can begin. The absence of an integrated tracking system [i.e., a record tracking mechanism which tracks the document from Rockwell, to the Site Office, to SAN, to the Program Offices (EM, NE, and ER), to EH, and back to the originator] has made the NEPA process inefficient (I-N-19) and in some instances has resulted in project delays (I-N-20).

This finding was fully identified in the SAN Self-Assessment (N-20) for DOE activities managed under the Rockwell ETEC contract and was partially addressed in the Site Contractor Self-Assessment (N-15), in which recordkeeping problems were identified.

Apparent causal factors which contributed to the finding are that the Site Contractor has not allocated adequate <u>resources</u> to establish and maintain NEPA records; a lack of formal <u>training</u> by DOE HQ in recordkeeping (for Rockwell, the Site Office, and SAN Program Managers), and tracking requirements (for the Site Office and SAN Program Managers); lack of a DOE EH <u>policy</u> to establish tracking responsibilities; and lack of a Rockwell Site Office and SAN <u>procedure</u> to receive routine training on the requirements for recordkeeping and tracking.

FINDING NEPA/CF-5: Inadequate NEPA Review of Proposed Actions

Performance Objective

The CEQ regulations (40 CFR 1502.25) require integration of the NEPA process with other environmental requirements and coordination with other agencies for implementation of this requirement [40 CFR 1500.2(c)].

DOE NEPA Guidelines (52 FR 47662) require, in part, coordination of NEPA compliance with environmental review requirements including those under the Endangered Species Act and the National Historic Preservation Act. In addition, Section D of the DOE NEPA Guidelines lists eligibility criteria for certain categorical exclusions (CXs). Moreover, when the draft proposed rule for the DOE NEPA Implementing Procedures under 10 CFR 1021 (55 FR 46444; November 2, 1990) are finalized, eligibility criteria will be required for all CXs.

Finding

DOE does not have authoritative and sufficient environmental documentation to support the analysis of potential impacts of DOE activities managed by Rockwell under the ETEC contract.

Discussion

There are no records at Rockwell, such as a check list, to show that DOE proposed actions would have no potential impact on sensitive environmental resources (I-N-6 and I-N-19). Some of the sensitive resources include cultural resources, endangered species, floodplains, wetlands, natural areas, prime agricultural lands, and special sources of water. In addition, DOE does not have records to verify authoritative sources of information to determine potential project impacts. Authoritative sources include the State Historic Preservation Officer, the U.S. Fish and Wildlife Service (for endangered species and wetlands), Flood Hazard Boundary Maps or Flood Insurance Rate Maps, National Park Service, Soil Conservation Service, and U.S. Geological Survey.

All proposed actions must be reviewed to determine the applicability of environmental requirements [Section c(4)]. In addition, some existing CXs specifically require screening with the eligibility criteria (e.g., General Plant Projects) (In the future, all CXs must be screened.) DOE has not obtained the appropriate data and a mechanism has not been established to validate this screening process.

This was not identified in the SAN Self-Assessment (N-20) for DOE activities managed under the Rockwell ETEC contract or in the Site Contractor Self-Assessment (N-15).

The apparent causal factor for this finding is a lack of a formal <u>procedure</u> by the Site Contractor to document compliance with DOE requirements.

SAFETY & HEALTH ASSESSMENT

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 representative safety and health programs at the Energy Technology Engineering Center (ETEC). A Technical Safety Appraisal (TSA) team was assembled for this purpose by the DOE Deputy Assistant Secretary for Safety and Quality Assurance, Office of Safety Appraisals (OSA). 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 ETEC, performance was appraised in the following technical areas: Organization and Administration, Quality Verification, Operations, Maintenance, Training and Certification, Auxiliary Systems, Emergency Preparedness, Technical Support, Packaging and Transportation, Security/Safety Interface, Experimental Activities, Site/Facility Safety Review, Radiological Protection, Worker Safety and Health Compliance (including a compliance inspection), Personnel Protection, Fire Protection, and Medical Services.

4.3 APPROACH

The TSA team was composed of DOE Headquarters experts, employees of DOE contractors, and outside consultants. The TSA was conducted according to the "Procedures for Conducting Technical Safety Appraisals," February 1991, and the "Protocol for the Conduct of Concurrent Tiger Team Assessments and Technical Safety Appraisals," January 16, 1990.

The S&H Subteam assessment was conducted from March 18 through April 10, 1991. Guidance and direction were provided by the Acting Director, Safety Inspection Division. The names of the Subteam members and their areas of responsibility are listed in Section 4.8; 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 or not current operations are being conducted within the scope of operational safety procedures and programs established for specific facilities and activities.

A comprehensive OSHA-type compliance appraisal was performed, covering general industry and construction work sites. The appraisal encompassed 29 of 50 buildings, approximately 58 percent of all occupied work areas.

The activities of the S&H Subteam were guided by the performance objectives and supporting criteria contained in the "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites," June 1990.

The findings and resulting concerns identified by the S&H Subteam were areas evaluated. Although nearly all of the performance objectives were addressed, this report cites only those objectives for which a concern was identified. Therefore, the reader is cautioned against forming an opinion of the safety and operational performance within an area without first reading the overview concerning that area. When a performance objective is not listed, the omission implies that the Subteam judged all applicable 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 craft personnel; and (3) reviewing policy statements, records, procedures, and other relevant documents. In addition, the ETEC self-assessment, "An Environmental, Health, and Safety Self-Assessment of the Energy Technology Engineering Center" (GEN-AR-0023), dated March 18, 1991, was reviewed. (See Table 1, p. 4-4.)

As defined by performance guidelines, a *concern* is raised about a situation that in the judgment of the S&H Subteam either: (1) reflects less than full compliance with a DOE safety and health requirement or mandatory safety standard; (2) threatens to compromise safe operation; or (3), if properly addressed, would be substantially improved. Because this last type of concern is raised to encourage excellence of operation, more concerns are reported than would result from a strictly compliance-oriented appraisal.

Drawing upon the experience of its appraisers, the S&H Subteam has made an effort to identify some of the factors responsible for each of the concerns. However, because they are not fully familiar with the details of ETEC's day-to-day operations, the S&H Subteam members recommend that ETEC consider the possibility that the findings, and even the statements of concern, may be symptoms of deeper rooted causes. ETEC and Rocketdyne management should seek out and eradicate such causes to ensure that improvements in operational safety will be sustained.

4.4 SAFETY AND HEALTH SUMMARY

This appraisal of ETEC facilities indicates that significant improvements are needed before the facilities can be judged to have an acceptable performance level according to the new safety culture stipulated for DOE sites. A total of 138 concerns are presented in the appraisal report, five of which are targeted specifically at SAN.

For each concern, the category rating, potential hazard level, and level of compliance were determined by using the criteria presented in Section 4.6. Of the 138 concerns identified, most were judged to be in Category III: those that noted significant noncompliances with DOE Orders, or the need for improvement in the margin of safety, but not of sufficient urgency to require immediate attention. Three concerns were evaluated as in Category II: posing significant risk or substantial noncompliance with DOE Orders, but not a clear and present danger to workers or members of the public. Two of the Category II concerns relate to electrical safety. The first is based on observations of specific equipment judged to pose serious hazard to employees. The second cites dangerous practices and noncompliance with Federal regulations. The third of the Category II concerns relates to industrial hygiene and cites a lack of management guidance and application oversight necessary for an effective health and safety program.

Table 1 provides a comparison between the concerns resulting from the ETEC Self-Assessment and those concerns identified during the S&H Subteam assessment. The result is that the ETEC Self-Assessment team identified 66.7 percent of the two Category II concerns found in the S&H Subteam assessment. However, only 39.2 percent of the 130 Category III concerns identified by the S&H Subteam were recognized by the ETEC Self-Assessment.

TABLE 1

COMPARISON OF SELF-ASSESSMENT PROBLEM IDENTIFICATION
WITH TSA CONCERNS

NUMBER OF SELF-ASSESSMENT CONCERNS/PERCENTAGE OF TSA
CONCERNS/TSA DISCIPLINE BY SERIOUSNESS CATEGORY

	CAT. I			CAT. II			CAT. III		
TSA DISCIPLINE	SELF	TSA	%TSA	SELF	TSA	%TSA	SELF	TSA	%TSA
ORGANIZATION & ADMINISTRATION	0	0	0	0	0	0	4	13	30.8
QUALITY VERIFICATION	0	0	0	0	0	0	9	21	42.8
OPERATIONS	0	0	0	0	0	0	2	5	40
MAINTENANCE	0	0	0	0	0	0	5	15	33.3
TRAINING & CERTIFICATION	0	0	0	0	0	0	4	9	44
AUXILIARY SYSTEMS	0	0	0	0	0	0	0	3	0
EMERGENCY PREPAREDNESS	0	0	0	0	0	0	2	7	28.6
TECHNICAL SUPPORT	0	0	0	0	0	0	3	10	30
PACKAGING & TRANSPORTATION	0	0	0	0	0	0	0	0	0
FACILITY PLANNING FOR SECURITY/ SAFEGUARDS INTERFACES	0	0	0	0	0	0	0	2	0
EXPERIMENTAL ACTIVITIES	0	0	0	0	0	0	0	0	0
SITE/FACILITY SAFETY REVIEW	0	0	0	0	0	0	3	3	100
RADIOLOGICAL PROTECTION	0	0	0	0	0	0	5	10	50
PERSONNEL PROTECTION	0	0	0	0	1	0	4	10	40
WORKER SAFETY & HEALTH (OSHA) COMPLIANCE	0	0	0	2	2	100	3	12	25
FIRE PROTECTION	0	0	0	0	0	0	5	5	100
MEDICAL SERVICES	0	0	0	0	0	0	2	6	33.3
TOTAL CONCERNS				2	3	66.7	51	130	39.2

In summarizing ETEC's S&H program, the key areas of concern that must be brought to the attention of DOE, ETEC, and Rocketdyne management are discussed briefly in the following paragraphs.

ETEC has amassed an acceptable safety record over the past 5 years. However, the usual management tools to promote and encourage safety are missing or inconsistently applied. Safety responsibilities and authorities are not specifically defined. Some procedures list safety responsibilities in a generic manner. Other documents, such as job descriptions and performance evaluations, seldom address safety matters, (e.g., safety goals, performance indicator charts, and the sharing of safety information with other DOE sites), has been sporadic or nonexistent. Independent safety oversight is not being performed, line safety actions are not being systematically recorded, and the distinction between line and independent safety is not well defined. Moreover, management has not been proactive in providing needed procedures, in ensuring compliance with DOE requirements, and in identifying the interface between ETEC personnel and Rocketdyne Plant Services.

The quality verification (QV) program at ETEC is not effectively implemented to meet the requirements of DOE 5700.6B. No integrated, sitewide quality program and policy are in place. The current QV system is judged to be less effective than former systems. Quality program requirements are reduced or eliminated when funding resources are limited, in an attempt to reduce project cost. Resource allocation and staff support have produced a system that operates in a minimal capacity. Line personnel working at ETEC do not know their responsibilities under the overall QV plan and therefore cannot fulfill them. With ETEC's future added responsibility for the Kalina facility, existing shortcomings will be amplified.

The two operations departments at ETEC have accrued acceptable safety records over the past 5 years. There is, however, no formally articulated safety awareness program. Operations controls are in place and working effectively, although Operational Safety Requirements have not been issued for active facilities. (This deficiency is currently being addressed.) A carefully monitored, though intricate, system ensures the current status and accuracy of operating procedures. In general, facility status controls are managed properly; a new, more formal, lock-and-tag program is in the early stages of implementation. Shift turnovers are successfully carried out in a professional manner. No evidence of significant deficiencies was observed in operator/equipment interfaces.

The maintenance activity is not well documented with respect to the requirements of DOE 4330.4. Organizational structure and group responsibilities are not well defined, and in some cases are not fully understood. In general, the maintenance status of ETEC test equipment is substandard, as evident in the many deficiencies that appear to have existed for long periods of time. The fact that operations personnel have a dual responsibility for maintenance as well as operations has resulted in a reduction of emphasis on maintenance. Rocketdyne Plant Services maintains the building, utilities, and grounds. However, this service is not managed, controlled, or evaluated in sufficient detail by ETEC. Funding limitations have curtailed the maintenance on inactive facilities to a point where continuing deterioration now presents hazardous conditions in some buildings.

No overall training program is in place at ETEC. Training is conducted on a sporadic basis with little coordination. The lack of a comprehensive training plan has resulted in personnel not knowing some important aspects of their job responsibilities. The recent addition of a Training Coordinator appears to be a positive effort, but that person retains responsibilities for two other functions as well. Rocketdyne support for ETEC training is limited. Both Rocketdyne and ETEC lack lesson plans, certified instructors, job task analysis, and ongoing review of training for continual improvement. In effect, training at ETEC has become a minimal effort.

Auxiliary systems and related control, testing, and operating requirements are not well defined. The programs for monitoring and controlling effluents and solid wastes were found to be properly staffed, documented, and controlled. However, deficiencies were noted in some inactive facilities that contained hazardous materials and in the operation of fume hoods in the Chemistry Laboratory. The emergency diesel and battery systems at the Sodium Component Test Installation (SCTI) were improperly tested. At SCTI, some auxiliary systems that have high-safety significance are not identified as such and as a result receive no special care, maintenance, or attention.

The major deficiencies of the ETEC emergency preparedness program are: 1) the lack of site-specific emergency plan implementing procedures (EPIPs) to support the provisions of the Rocketdyne Master Emergency Plan, 2) the need to draft and develop an emergency preparedness training program for all members of the ETEC emergency response organization, and 3) no schedule of joint emergency response drills and exercises to achieve a coordinated emergency response effort.

The technical support function is providing the appropriate levels of support. However, deficiencies are identified in the scope and content of Safety Analyses and Operational Safety Requirements, review of safety-related documents, code and standard identification, equipment performance evaluation, and monitoring environmental releases.

Rocketdyne Protective Services at SSFL provides security to ETEC. Removal of all reactor test fuel from the ETEC site eliminated the potential for safeguards emergencies. As a result, no special engineering review of safeguards/security improvements (to guarantee safety) is required because no reactor test fuel facilities exist and none are planned. Moreover, by mutual agreement between ETEC management and Rocketdyne Security, security drills at ETEC have been discontinued. Protective Services practice is not to impede ingress or egress of emergency vehicles, although such practice was not cited in the Post Orders at the entrance guard post. The training programs for Protective Services personnel are well structured and well executed. Protective Service Officers carry firearms on the ETEC site. However, no audits of firearms safety at ETEC are being conducted.

In the conventional sense, ETEC facilities are not currently used for "experimental activities." They are used, however, to test a wide variety of components. Test proposals are normally major program items at ETEC. The proposals are written in the form of "Test Requests" and receive intense technical and administrative scrutiny in the review process. For major projects, the review culminates in a Test Readiness Review; if consensus approval results, the test can be initiated.

No independent ES&H internal appraisal system, as required by DOE 5482.1B, Section 9.d., is defined in the ETEC overview system. Ad hoc groups are formed, when required, to perform Operations Readiness Reviews. The Rocketdyne Health, Safety, and Environment Department has been assigned oversight responsibility for ETEC activities. However, these measures have not achieved compliance with DOE requirements. The periodic comprehensive site safety audits and the triennial management evaluations of the internal appraisal system, both required by DOE 5482.1B, are not being performed.

Documentation has not been issued on most aspects of the radiological protection program. Moreover, no active ALARA program is in place. Most findings and concerns reflect a lack of management attention to programmatic details and a lack of oversight of operations requiring protection from radiation.

The personnel protection program at ETEC is not well coordinated and organized and is therefore not effective. Because of a lack of involvement, oversight, and support from the Rocketdyne Health, Safety, and Environment Department, health and safety hazards are not identified, recognized, evaluated, or controlled. The lack of procedural and managerial guidance has resulted in no program of self-inspections, no safety meetings, and no systematic approach toward safety. Specific deficiencies were noted in: 1) procedures, 2) oversight of construction safety, 3) monitoring asbestos exposure, 4) monitoring D&D activities, and 5) monitoring, evaluation, awareness, and control of hazards.

A total of 155 OSHA noncompliance issues were identified at ETEC, of which 153 were considered "serious." Electrical safety noncompliance issues accounted for most of the hazards identified (53.1 percent). The second largest category of noncompliance issues (15.7 percent) was noted in the area of machine guarding. Significant noncompliances were also noted as to toxic substances, walking surfaces, construction sites, personal protection features, and material handling practices.

Fire protection at ETEC is provided by personnel assigned to the Rocketdyne Industrial Security Department. In this department, the Fire Protection Engineering and Emergency Planning Section is responsible for fire emergency planning, and the Protective Service (Santa Susana) Section is responsible for both fire protection and security on the ETEC site. The fire protection group does not meet all the requirements of NFPA 1500: in particular, the group does not include four personnel trained in the use of initial emergency response fire apparatus. The Fire Protection Engineering Section, which has Fire Prevention and Emergency Preparedness responsibilities throughout the Rocketdyne operations, has only two members to provide these services. The Appraisal Team judged that the number of fire protection personnel and fire protection engineering personnel is not sufficient to ensure timely response to tasks consistent with the higher standards expected under DOE's new fire and safety requirements.

Medical services for ETEC are provided through the Rocketdyne Division. The staff was judged to be qualified, and a number of the medical support programs were considered well run. However, staffing levels are significantly below DOE guidelines, and physical facilities do not meet DOE requirements. Other deficiencies cited were the degree of involvement of the Medical Director in management activities germane to medical services, the system for keeping medical records, and the physical examination program.

4.5 SAFETY AND HEALTH FINDINGS AND CONCERNS

4.5.1 Organization and Administration

4.5.1.1 Overview

The Safety and Health (S&H) Subteam appraisal of Organization and Administration (O&A) was performed by interviewing all levels of management, including the ETEC General Manager and the Rocketdyne Vice President responsible for ETEC. Technicians and craft personnel were also interviewed. ETEC, Rocketdyne, and Rockwell International documents were reviewed and a general tour was made of the ETEC site. All of the performance objectives and criteria pertaining to O&A were addressed. Concerns were noted as to all eight of the performance objectives.

There is currently a high emphasis on safety at ETEC. It was reported that this has not always been the case and that ETEC's safety emphasis usually corresponds directly with DOE's emphasis on safety. However, the S&H Subteam report lists many areas in which SAN is not currently providing the required guidance and oversight to ensure compliance with DOE requirements.

Even though safety meetings are not held on a regular basis, for either hourly or salaried personnel, most managers and staff members thought that ETEC was a safe place to work. Some thought that when resources were more plentiful, as there were in some past years, ETEC operations were safer because greater attention could be applied to safety issues.

ETEC has had a good past safety record, but the setting of safety goals to improve the overall level of safety has not been a regular part of safety management; nor has there been trending or tracking of performance indicators to help determine the root causes of safety problems.

Most people indicated that they are happy with their jobs. Turnover in staff is small. Consequently, the work force is aging and many retirements are forthcoming in the next few years. In some cases, such as the Calibration Laboratory, a high percentage of the staff will be eligible for retirement in the next few years. This aging work force has not presented a problem to date because of a company policy that allows the rehiring of retirees as part-time employees. However, this situation will require constant management attention to prevent a decline in "corporate knowledge." (See Sections QV.4 and MA.3.)

The work force at ETEC is small and many of the managers and staff have worked together for many years. However, there is a lack of definition in the formal assignment of responsibilities and the commensurate delegation of authority to fulfill these responsibilities. Performance evaluations have not been consistently conducted and, in many cases, personnel paid on an hourly basis reported that they never received either a written or verbal evaluation of their activities, except, in some cases, for a reprimand for less than adequate performance.

Rocketdyne provides some support, assistance, and independent safety oversight to ETEC. However, the mechanism by which to assign responsibility for ensuring that an applicable DOE requirement is being fulfilled is not well defined, understood, or implemented.

The distinction between line safety responsibilities and independent safety oversight is not crisply drawn. In some cases, safety personnel may have a conflict when performing independent safety oversight; in other cases, some independent safety functions, as required by DOE Orders, are not being performed. (See Section FR.1.)

Important documents are not consistently controlled and there is no independent assurance that controlled documents are kept current. It was reported that the ETEC operations are highly proceduralized. However, there is no requirement for periodic review and update of ETEC Procedures. Substantive pen-and-ink changes to ETEC Procedures, contrary to company policy, do not deliver the message that it is important to follow procedures. Management is not proactive in ensuring that operating procedures are followed and that operating procedures exist to implement all DOE requirements. A large number of procedures do not fulfill their intended functions.

There is a substance abuse program at ETEC. However, formal training has been limited to management personnel, and no periodic retraining is scheduled. Not all managers and staff members are screened for drug use on a regular basis, and the criteria for drug screening and a medical examination are not the same.

In summary, ETEC has an acceptable past safety record, but constant vigilance is needed to maintain this acceptable level of safety.

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:

- Not all managers and staff members have current position/job descriptions that delineate their safety responsibilities and the authority to carry them out.
- Some position/job descriptions provided to the Appraisal Team were dated 1984 and did not include safety as a responsibility.
- Some managers and staff members stated that they did not have position/job descriptions.
- Some salaried personnel stated they were unaware of having any written safety responsibilities.
- Some safety responsibilities are assigned via the ETEC Procedures Manual. However, the commensurate authority to fulfill these responsibilities is not clearly defined.
- Some salaried personnel stated that all of their safety responsibilities were included in their performance evaluations. However, past performance evaluations have not included safety.
- Some managers stated that their authority to enforce safety-related policies and actions was automatic by virtue of their positions in the organization.
- The need for annual updates of job descriptions was noted in the ETEC Self-Assessment.
- See also Section TS.1 and Concern MA.1-2.

CONCERN: **(OA.1-1)** **(H2/C2)**

Safety responsibilities specific to each job or position, and the commensurate authority to accomplish these responsibilities, are not always clearly defined.

FINDINGS:

- It was reported that no requirement exists for personnel paid on an hourly basis to hold regularly scheduled safety meetings.

- A program is in place that requires the appointment of hourly paid personnel to serve as safety representatives for each working unit for 1 year. During this time they attend monthly safety meetings and perform specifically designated safety functions for their working units. It was reported that three such safety representatives had been appointed out of almost 40 hourly paid personnel to serve all of ETEC.

- Staff reported that some designated safety representatives regularly shared information from the monthly safety meeting with other staff members, while other designated safety representatives rarely, if ever, shared this information.

- It was reported that the safety aspects of unusual events that occur within ETEC were sometimes discussed, but that occurrences from outside ETEC, but within the DOE facility, were seldom discussed at safety or staff meetings. (See Section TS.4.)

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concern OP.1-1.

CONCERN: **(OA.1-2)** **(H2/C2)**

Regularly scheduled safety meetings are not always held for all staff personnel, and safety information is not always shared as a means of promoting safe operations.

FINDINGS:

- It was reported that ETEC is not safety compliance oriented, but is primarily driven by programmatic requirements.

- It was reported that a list of DOE Orders which apply to safety and health at ETEC has not been identified by SAN.

- There is no integrated management program that ensures that each DOE safety requirement is assigned and being fulfilled.

- A high percentage (60 percent) of the S&H Subteam concerns address some aspect of ETEC's noncompliance with DOE requirements.

- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: **(OA.1-3)** **(H2/C2)**

ETEC management has not been proactive in ensuring compliance with DOE safety and health requirements.

OA.2 ADMINISTRATION

PERFORMANCE OBJECTIVE: Administrative programs and controls should be in place to ensure policies concerning health and safety are administered throughout the facility.

FINDINGS:

- HS&E management stated that HS&E performs both safety support and independent safety oversight.
- The ETEC Safety and Health Coordinator stated that he has some line safety responsibility; however, ETEC Procedure No. 1-03, "Health, Safety, and Fire Protection Program," assigns the ES&H Coordinator the responsibility of performing appraisals to demonstrate implementation of DOE Orders.
- The responsibility for the independent, internal appraisals and reviews required by DOE 5482.1B and DOE 5480.5 has only recently been assigned; however, the appraisals have not been started. (See Concern FR.1-1.)
- There is an insufficient oversight of Radiological Protection, resulting in a general lack of radiation safety awareness and acceptance of procedures and practices required by DOE 5480.11. (See Concern RP.1-1.)
- This concern was not addressed in the ETEC Self-Assessment.
- See also Concerns PP.3-1, PP.4-2, FR.1-1, and TS.3-1; and Sections FR.4 and FR.5.

CONCERN:
(OA.2-1)
(H2/C2)

The distinction between the line safety assurance program and the independent safety overview program has not been defined, nor have staff been assigned to accomplish each program so as not to present a conflict or potential conflict of interest.

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:

- Most managers and staff interviewed were not aware of any specific written safety goals for ETEC.
- HS&E has developed accident prevention goals for FY91 that apply to Rocketdyne, including ETEC.
- The Sodium Component Test Installation (SCTI) Program Operations has goals for FY91; however, these goals are primarily programmatic with the exception of a few safety-related goals regarding staffing, training, and maintaining a safe working environment.
- This concern was not specifically addressed in the ETEC Self-Assessment.
- See also Concern OP.1-1.

CONCERN: **Written safety goals are not established or widely promulgated within ETEC.**
(OA.3-1)
(H2/C2)

OA.4 CORPORATE SUPPORT

PERFORMANCE OBJECTIVE: Corporate interest and support for safe operation should be evident.

FINDINGS:

- Rocketdyne provides support, assistance, and independent safety oversight to ETEC; however, the interface for accomplishing these activities and the responsibility for ensuring that DOE requirements are met are not clearly defined, understood, or implemented.

- The maintenance program for utilities, buildings, and grounds is conducted by Rocketdyne Plant Services, which has a primary role in planning these activities. The ETEC Facility Programs organization does not play an active role in establishing requirements, managing, or tracking these activities. ETEC does not have an overall policy which clearly defines the maintenance requirements for each class of facility, including active, inactive, and active or inactive standby. (See Concern MA.1-2.)

- Discussion with SCTI Operations Engineers indicated that the operations organization is not able to exercise necessary control over maintenance and troubleshooting activities performed on plant process hardware by Rocketdyne maintenance personnel. It was reported that improvements have been made in this area; however, more work is required. (See Concern OP.5-1.)

- Rocketdyne Protective Services personnel carry firearms on the ETEC site despite the fact that SAN does not stipulate that requirement, as confirmed by discussion with Rocketdyne and SAN management personnel. (See Concern SS.4-1.)

- Mutual aid firefighting assistance for the ETEC site is available from Ventura County Fire Department, Los Angeles County Fire Department, and Los Angeles City Fire Department. However, the closest mutual aid firefighting assistance is at least 20 minutes from ETEC facilities. (See Concern FP.6-2.)

- The distinction between the line safety assurance program and the independent safety overview program has not been defined, nor have staff been assigned to accomplish each program so as not to present a conflict or potential conflict of interest. (See Concern OA.2-1.)

- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: **(OA.4-1)** **(H2/C2)**	**The interfaces and assignments of responsibility for for ensuring support, assistance and independent safety oversight of those activities provided by Rocketdyne to ETEC are not well defined.**

OA.5 MANAGEMENT ASSESSMENT

PERFORMANCE OBJECTIVE: Management and supervisory personnel should monitor and assess facility activities to improve performance in all aspects of the operation.

FINDINGS:

- Rocketdyne has been plotting some performance indicators; however, these have not been posted or distributed below the ETEC General Manager level. Even though there is no requirement to do so, in some cases this information is verbally shared with lower levels of management and staff.
- There is no ETEC procedure to address the plotting of performance indicators; however, one is currently being developed to meet the new DOE requirement.
- ETEC does plot trend analyses for unusual and nonconformance events, but no other performance indicators are currently being plotted.
- This concern was addressed in the ETEC Self-Assessment.
- See also Concerns TS.4-1 and QV.1-3; and Sections TC.1 and RP.4.

CONCERN: (OA.5-1) (H2/C2) **Performance indicators have not been used as a means of promoting and encouraging safety in the workplace.**

FINDINGS:

- It was reported that SAN has not provided to ETEC an agreed-upon list of DOE safety and health orders.
- SAN has not provided the necessary oversight of ETEC activities as noted in the following concerns and sections of the S&H Subteam report: Concerns MA.4-1, EP.2-2, and TS.3-3; and Sections SS.4 and FP.6.
- This concern was addressed in the SAN Self-Assessment.

CONCERN: (OA.5-2) (H2/C1) **SAN has not provided the necessary oversight of ETEC activities to ensure safe operations and compliance with DOE requirements.**

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:

- Performance evaluations of salaried personnel are not consistently performed on an annual basis.
- Many hourly paid personnel never receive any kind of written or oral evaluation of their performance.
- It was reported that past performance evaluations did not consistently include safety as a performance element.
- Some salaried personnel were under the impression that all of their responsibilities, including those related to safety, were taken into account in their performance evaluations. However, safety has not been addressed in past performance evaluations.
- It was reported that employer-employee expectations, which are the baseline for performance evaluations, are not always discussed at the beginning of an evaluation period.
- This latter concern was discussed in the ETEC Self-Assessment, which stated that the General Manager has initiated action to correct this deficiency.
- See also Concern OP.1-1.

CONCERN:
(OA.6-1)
(H2/C2)

Annual performance evaluations are not regularly performed, and safety has not been a consistent element in past evaluations.

OA.7 DOCUMENT CONTROL

PERFORMANCE OBJECTIVE: Document control systems should provide correct, readily accessible information to support site/facility operations.

FINDINGS:

- The method of keeping documents current is not consistent for all controlled documents. It was reported that some revisions to controlled documents require the recipient to sign and return a statement that the revised pages have been inserted into the document, while revisions to other controlled documents do not require a return receipt.

- The factual accuracy response stated that audits are being performed. However, none of those interviewed were aware of any audit performed to ensure that their copies of controlled documents were indeed being maintained current.

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concern MA.8-1.

CONCERN: (OA.7-1) (H2/C2) **"Controlled Documents" are not consistently controlled, and there is no independent assurance that controlled documents are maintained current.**

FINDINGS:

- ETEC Procedure 1-01, "Content, Preparation, and Use of ETEC Procedures and Departmental Directives" (January 16, 1991), only allows pen-and-ink changes to ETEC Procedures to correct typographical errors, while ETEC Procedure 6-03, "Preparation and Control of Test and Operating Procedures" (June 15, 1989), states that minor changes to test and operating procedures can be made in pen and ink.

- The ETEC Procedures in the Tiger Team library contained substantive pen-and ink changes in the following sections: 2-14, "Recording and Control of Non-ETEC-Originated Documents" (September 20, 1984); 2-38, "Construction Service Contracts" (February 26, 1990); 3-04, "Preparation and Control of ETEC Procurement Specifications" (September 24, 1984); 3-11, "Application of Codes and Standards" (September 10, 1984); 4-06, "Preparation and Control of Purchase Requisitions" (June 29, 1990); and 6-03, "Preparation and Control of Test and Operating Procedures" (June 15, 1989).

- There is no prescribed frequency for the review and update of ETEC Procedures. However, ETEC Procedure 6-03, "Preparation and Control of Test and Operating Procedures" (February 18, 1991), has a "Note" that requires active operating procedures to be reviewed annually and the review documented.

- The first part of this concern was addressed in the ETEC Self-Assessment.

- See also Concerns MA.8-1, QV.1-7, QV.1-8, EP.2-1, and OP.3-1.

CONCERN: (OA.7-2) (H3/C2) **There is no requirement for periodic review and update of ETEC Procedures and, contrary to ETEC requirements, substantive pen-and-ink changes have been made to ETEC Procedures.**

FINDINGS:

- It was reported that the ETEC operations are highly proceduralized. However, the S&H Subteam observed instances where procedures were not being followed, where they were inadequate, or where there were too few of them in place:

  - Instances of procedures not being followed are noted in Concerns MA.4-2, MA.6-1, QV.1-7, QV.1-8, QV.5-3, QV.5-4, and OA.7-2; and in Section PP.2.

  - Inadequate procedures are noted in Concerns PP.2-1, PP.2-2, PP.5-1, PP.5-2, MA.6-1, MA.7-1, RP.4-1, RP.5-1, TS.3-2, QV.1-4, and QV.1-7; and Section PP.1.

  - The lack of procedures is noted in Concerns PP.1-1, PP.2-1, PP.2-2, SS.2-1, RP.3-1, RP.5-2, RP.6-1, RP.7-1, RP.10-1, PP.2-1, EP.3-1, EP.6-1, EP.7-1, MA.1-1, MA.8-1, TS.3-1, TC.1-1, TC.5-1, QV.1-1, and QV.4-1.

- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: (OA.7-3) (H2/C2) **Management is not ensuring that procedures are being followed, that procedures address all areas necessary to ensure safe operation, and that procedures are always available when needed.**

OA.8 FITNESS FOR DUTY

PERFORMANCE OBJECTIVE: A Fitness For Duty Program should be capable of identifying persons who are unfit for their assigned duties as a result of drug or alcohol use, or other physical or psychological conditions, and should provide procedures to remove them from such duty and from access to vital areas of the site or facility pending rehabilitation or remedial actions.

FINDINGS:

- Rocketdyne Operating Policies (ROP) Section E-506.1, "Drug/Alcohol Policy," indicates that the following are required to have drug screening tests:
    - All applicants for hire or rehire
    - Employees who return to work after being on inactive status or leave of absence for 60 days or more
    - Employees who are reported or observed to be impaired while on the job
    - Employees in certain safety-related positions, such as guards, pilots, members of emergency teams, drivers, and those handling hazardous substances (These employees are given drug tests annually.)
- Rockwell International Publication 2501-D-52, Rev. 9-88, "Drug/Alcohol Program Policy & Procedures," Attachment E, "Employees Subject to Annual Drug Testing," expands the list of those required to have annual drug testing by being more specific as well as including categories not in ROP E-506.1.
- It was reported that only those who receive an annual medical examination receive annual drug testing. However, the criteria for annual medical surveillance contained in ROP M-513, "Medical Surveillance Programs," states that "Employees exposed or facing potential exposure to certain toxic substances or physiologically stressful environments...will be placed on appropriate medical surveillance programs...." (See Concern MS.3-3.)
- The Drug/Alcohol Program includes an Employee Assistance Program (EAP), yet many managers and staff members interviewed knew very little about the EAP.

- Most ETEC managers received training in substance abuse about 2 years ago. However, no retraining has been scheduled and no training for staff employees is planned.

- Several staff employees expressed the opinion that not all managers and staff members in a position to cause harm to themselves or others, or to cause property damage, are receiving annual drug/alcohol screening.

- This latter concern was not included in the ETEC Self-Assessment.

- See also Concern MS.3-3.

CONCERN: (OA.8-1) (H3/C2) **Not all management and staff have received training on substance abuse and the Employee Assistance Program, and retraining for management has not been scheduled.**

CONCERN: (OA.8-2) (H3/C2) **The criteria for medical surveillance and annual drug screening tests are not entirely consistent.**

4.5.2 Quality Verification

4.5.2.1 Overview

This assessment was performed to evaluate all seven of the performance objectives in the Quality Verification (QV) area. The assessment was conducted using performance-based techniques that emphasize the effectiveness of the line implementation of programs, rather than the programs themselves. In some instances, the cause of observed deficiencies led to programmatic problems. In these cases, the program was subjected to a more intensive review.

Quality assurance is defined as confidence that items and activities perform as intended. One focus of this assessment therefore was on whether or not desired results could be achieved by ETEC personnel the first time a task was attempted.

The results of this assessment reflect that the overall QV program at ETEC is not effectively implemented to meet the requirements of DOE 5700.6B or ANSI/ASME NQA-1. Significant concerns are noted in each appraisal area. The quantity and type of concerns noted are indicative of a lack of resource dedication and support for quality achievement and improvement. Major deficiencies were noted in three universal areas: personnel resources, procedures, and individual commitment.

The purpose of inspections and audits is to determine and report to management the status of items and processes. The QV Department at ETEC is not staffed at a level to provide effective feedback to management about a facility that operates on a 7-day-per-week, 24-hour-per-day schedule. Resource allocation is not supportive of a comprehensive quality verification system that meets DOE requirements. This results in a limited quality investment, minimal inspections, and removal of inspection plans from project budgets. The QV staff is then forced to conduct evaluations without needed technical expertise and support. When major technical deficiencies are not noted during these evaluations, management is misled that ETEC activities must be adequate; there were few audit findings to indicate otherwise.

Procedures are an important part of any complex activity to ensure correct and consistent work results. At ETEC, many critical activities do not have a controlling procedure. When procedures do exist, they often are not coordinated with other procedures. This causes confusion to people who must implement them. In some cases, existing procedures are technically incorrect. Instances were observed where personnel were aware of these inaccuracies, and either violated the procedures and acted in the manner they believed correct, or followed the procedure and intentionally did something wrong.

At all levels at ETEC, some individuals failed to demonstrate a personal commitment to do things right. In some cases, even where adverse or even dangerous conditions were known, they were allowed to persist. When discrepancies were identified, it was not uncommon for the response to be no more than a remark to the effect that "someone should look at that." Some individuals were observed to forgo any responsibility to identify and correct problems. Many staff members, from managers through the rank and file, neither exhibited an understanding of the seriousness of their responsibilities, nor a commitment to doing their individual best. There were, of course, countervailing examples of personal commitment to excellence. The calibration activities conducted in Bldg. T066 are an example of competent personnel working under a manager who demands excellence. If this were pervasive at ETEC, many of the deficiencies noted would disappear.

The overall assessment of quality verification at ETEC shows a degradation of quality over an extended period of time. Some additional causal factors behind the degradation may include DOE/ETEC budgetary limits and the interface between ETEC and the union representing the inspection force. This trend can be reversed. Effective QV programs are marked by vigilant management support. That support is demonstrated through commitments of resources and by personal example. Managers within effective programs understand the value in their quality investment, and set uncompromising examples for line personnel to follow.

4.5.2.2 Findings and Concerns

QV.1 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:

- No integrated Quality Assurance Program (QAP) exists for DOE-related activities at ETEC as required by DOE 5700.6B.
- The existing QAP Index meets the definition of a QA Plan, as described in DOE 5700.6B as "references the quality assurance elements...," but does not meet Paragraph 9 requirements.
- The following concern was not addressed by the ETEC Self-Assessment.
- See Concerns TS.2-3 and QA.7-3.

CONCERN: (QV.1-1) (H3/C1) **ETEC has not developed an integrated QA plan that meets DOE 5700.6B and SAN MD 5481.1A, *including measurable quality objectives and actions* required to implement stated quality assurance policy.**

FINDINGS:

- No ETEC quality verification personnel, including the manager and the inspectors, have stop-work authority. This procedure is currently being revised.
- The following concern was addressed in the ETEC Self-Assessment.

CONCERN: (QV.1-2) (H2/C2) **Stop-work authority is a fundamental aspect of an effective inspection program, yet ETEC inspection personnel cannot stop work.**

FINDINGS:

- No trending system exists for evaluating short- or long-term operational trends at ETEC facilities.
- The QA trending system and report simply review the items of concern identified by the QV program. Root causes and lessons learned are not incorporated. In the 1990 trend report, the top five leading reasons given for stopping work were "unknown, personnel error, design error, lack of control, and none established."
- There is no preventive maintenance review or trending system.
- The following concern was addressed in the ETEC Self-Assessment.

- See Concerns OA.5-1, RP.4-1, and TS.4-1.

CONCERN: (QV.1-3) (H2/C2) **Ongoing activities are not evaluated to identify short- or long-term trends that are adverse to quality.**

FINDINGS:

- The Steam Accumulator Blowdown Evaluation Rig (SABER) facility is being maintained using procedures for facilities deemed inactive. The official ETEC status is active standby.

- Conduct of operations in the Sodium Component Test Installation (SCTI) control room is very informal. One operator was observed to have food in the control room. Access to the control room was not limited, nor was permission required by the shift supervisor before entering. This condition has been changed as a result of this assessment. Permission is now required to enter the "pit" or actual control area.

- During night shift operations, the SCTI experienced a runaway heater. Point 628 was reading 355°F; the temperature was supposed to be 125°F. Communications between the Shift Leader and the operators lacked formality; there was no identification of one another, and no readback of information.

- The following concern was addressed in the ETEC Self-Assessment.

- See Concerns RP.3-1 and QA.7-3.

CONCERN: (QV.1-4) (H2/C1) **The lack of specific procedural requirements and verification has resulted in activities that do not meet the requirements of DOE 5480.19 and DOE 5480.11.**

FINDINGS:

- An audit of site radiation protection activities was conducted by an individual who was not qualified as an auditor, either administratively or technically. (See Concern RP.2-1.)

- ETEC audits are conducted on an 18-month schedule. DOE 5700.6B, Section 6, requires to "assure that all aspects...(of the program)...include: 1. Periodic and timely reviews...." ANSI/ASME NQA-1 also states: "Planned and scheduled audits shall be performed to verify compliance with all aspects of the quality assurance program and to determine its effectiveness"; there is no method to determine whether or not this is accomplished. (See also Concern SS.4-1.)

- One auditor conducts almost all of the audits. This person has two different audit certifications, both of which are current but have different dates. One is now overdue for annual evaluation; the other is not.

- The QV auditor rarely receives specialized technical training before an audit, and outside technical expertise is seldom used.

- Several audits were reviewed with the auditor. Many questions were answered with "SAT" or "UNSAT"; no objective evidence was provided to justify determinations. Questioned about how determinations were made, the auditor could not recall the method or basis for many of them.

- Several technical inaccuracies were noted in ETEC audits; the auditor was not aware of the technical basis of some items evaluated. (See Concerns FR.4-1 and FR.5-1.)

- Most ETEC audits are conducted to review and evaluate programs or review documentation; few are to evaluate implementation or performance.

- The following concern was addressed in the ETEC Self-Assessment.

CONCERN: (QV.1-5) (H3/C2) **Quality audits at ETEC do not evaluate the effectiveness of program implementation as required by DOE 5700.6B, Paragraph 7a. Some audits are conducted by personnel that do not meet the technical or administrative qualifications of ANSI/ASME NQA-1.**

FINDINGS:

- Correction of problems identified through audits is perfunctory, with a reluctance to identify and eradicate root causes. One example is the recent use of "the-program-is-over" to justify not fixing the problems cited. The audit findings are thus bypassed, and the problems resurface in new or resurrected programs. Lessons learned are not applied to operations at ETEC or other DOE sites.

- Some corrective action in response to audit findings is not performed in a timely manner.

- The Rocketdyne ombudsman and "speak-up" programs to identify and correct problems have not received any response from any employee assigned to ETEC.

- The following concern was addressed in the ETEC Self-Assessment.

CONCERN: **(QV.1-6) (H2/C2)**

Actions to correct identified deficiencies do not determine and correct their causes. Some identified deficiencies are allowed to continue uncorrected.

FINDINGS:

- An operator was observed conducting an in-service Fan Bearing Cooling System Leak Check for acceptance of some new piping added as a modification at SCTI. The pre-job briefing with the Shift Leader included face-to-face discussion, and each demonstrated a good knowledge of the setup for the test.

  - The operator removed red tags and returned them to the control room before starting the test.

  - The operator used a copy of the procedure, which was available throughout the test. The operator then aligned the system for the test.

  - Before the operator could walk down the line, contractor employees were manually positioning other system valves, without the knowledge of the operator or control room, and without the use of any procedure.

  - Flow gauge FI-1654A indicated a pegged flow reading and was leaking water. An adjacent valve, V-1655A, had the handle removed and wired to the piping. This valve was in the open position.

  - The operator put the handle back on the valve and closed the valve. This was done without a procedure and without notifying the control room. Closing the valve did not change the flow reading or stop the leaking.

  - ETEC personnel were asked who had actual responsibility for this test and for acceptance of the system. They stated it was the operator.

  - The operator noted two leaks, one at V-16024A and one at FI-1654A. The operator then restored the line to pre-test alignment, except for V1655A, which was left closed.

  - The operator did not inspect each connection on the line, and water was noted on the bottom of an elbow not identified by the operator as leaking. The operator returned to the control room and informed the Shift Leader of the test results.

- The operator did not mention his actuation of V-1655A, nor that its current condition was closed. The Shift Leader was therefore unaware of the current system alignment. The appraiser debriefed the operator and the Shift Leader on the success of the test, and informed the Shift Leader of the alignment change.

- The procedure used for this test does not address what the operator is to do in the event of detected leaks; it states "verify no visible leaks."

- The chemistry lab does not have specific procedures for many activities it performs.

- There is no procedure for conducting radiation surveys at ETEC. (See also Concern RP.3-1.)

- Standardization of radiation protection/health physics lab equipment is performed without the use of procedures, but most standards used are National Institute of Standards and Technology (NIST) traceable.

- Maintenance activities on the emergency diesel generators for SCTI (Bldg. T355) and Power Pak (Bldg. T228) were reviewed. Workers informed the control room that the preventive maintenance test activities were going to happen.

- The SCTI diesel was delayed when the appraiser noted that the hold-down studs did not have any nuts on them. The studs have not had nuts on them since the last time the equipment was painted. The nuts were placed and tightened on four of the six studs. (Two could not be placed due to interference with the diesel stand.)

- The SCTI diesel was cold-started using the manual start mode. This does not test the ability of the diesel to auto start on loss of power. The technicians stated that they normally test this diesel using the manual start mode.

- The diesels were started and operated for 30 minutes with no load. Although the diesels were tested under load in the past, that is not done now, even though there is equipment onsite that would allow for load testing.

- Not using the auto start or "test" mode, combined with not proving the ability to operate at load, means the operability of the SCTI diesel cannot be ensured.

- Panel gauges for SCTI and Power Pak diesels are used for operability acceptance, but are not calibrated. (See also Concern QV.4-1.)

- The testing and preventive maintenance for emergency control power backup batteries for SCTI and the Power Pak were reviewed. The specific gravity readings for some cells were considerably lower than others.

- Intercell voltages were tested with the charger on. This is standard practice for battery tests at ETEC. By testing with the charger on, the voltage readings are simply charger output, not actual cell voltages. No variance or low readings would be expected with the charger on, and none were observed.

- The operability and condition of the emergency DC power supply cannot be ensured by these tests.

- There was no quality verification oversight of the diesel or battery tests.

- Preventive maintenance (PM) activities on a heating, ventilation, and air conditioning (HVAC) unit located on the roof of Bldg. T487 were carried out with reference to the PM checklist. The checklist includes items such as "check for proper head pressure and suction readings." It does not identify what those readings should be.

- The HVAC PM work was performed by two technicians, one HVAC technician, and one electrician. The HVAC technician did not tag or lock out the safety switch to prevent use before entering the enclosure as required by 29 CFR 1910.147. During the work, both the electrician and HVAC technician had to leave the work area to obtain parts. When the second man was about to leave the work area unattended, the appraiser called to his attention the open energized electrical box that would be left unattended. At the request of the appraiser, the box was closed and secured with a screw. The technicians indicated that they often worked together and communicated well, so they did not need to tag or lock out items. They stated that lockout or tagging is only done when an item is to be left unattended for a long period of time.

- After the potential for injury or death was explained to them, the electrician locked the safety switch on the HVAC unit. The HVAC technician was the one who was entering the enclosure; he therefore should have been the one to lock out the switch.

- A log is maintained in the control room for personnel entering and leaving, but its use is not enforced.

- See Concerns OA.7-2, OA.7-3, QV.4-1, PP.2-2, OP.3-1, MA.6-1, and MA.8-1.

- The following concerns were addressed in the ETEC Self-Assessment.

CONCERN: (QV.1-7) (H1/C2) **Procedures in use at ETEC do not provide a level of detail needed to direct personnel in the correct completion of work and are not always technically correct.**

CONCERN: (QV.1-8) (H1/C1) **ETEC management does not require vigilant conformance to procedures, resulting in widespread, procedural noncompliance with ETEC Procedures and DOE 5700.6B, including work practices that place ETEC personnel in danger.**

FINDINGS:

- The original chemistry test records are stored in 3-ring binders on a bookshelf directly under a sprinkler head.
- Standard certifications and calibration records are stored in various buildings, in ordinary file cabinets. A fire in one of these buildings could destroy almost all records of calibration at ETEC. This does not meet the requirements of ANSI/ASME NQA-1 or DOE 1324.2A for records storage.
- Maintenance records are stored in an area with no fire protection.
- The following concern was not addressed in the ETEC Self-Assessment.
- See Concern RP.5-1.

CONCERN: (QV.1-9) (H3/C1) **Important records are not stored, maintained, and protected from damage as required by ANSI/ASME NQA-1, DOE 5480.11, and DOE 1324.2A.**

FINDINGS:

- The Kalina facility has a Safety Analysis Document (SAD) that is currently being revised to include Operational Safety Requirements (OSRs). As-built drawings have been assembled at milestone completions in the past, and are called for in the future. The new (issued 3/21/91) program management plan calls for ETEC to provide quality verification for Kalina, and includes two readiness reviews before full-scale operation.
- It will be very difficult for ETEC to support additional quality verification activities with existing staff.
- The agreement with the union representing inspection personnel prevents qualified, salaried QV personnel from assisting in inspections.

- The following concern was not addressed in the ETEC Self-Assessment.

CONCERN: (QV.1-10 (H2/C2) **Current QV resource allotment cannot support a quality verification program that meets the requirements of ANSI/ASME NQA-1 and DOE 5700.6B.**

QV.2 PROCUREMENT AND SUPPLIER CONTROL

PERFORMANCE OBJECTIVE: Provisions should be established for the control of purchased material, equipment, and services; for selection and control of suppliers; and for assessment of the adequacy of procurement activities.

FINDINGS:

- Maintenance and material control in two subcontract jobs was reviewed. One job consists of insulation of the H1 Heater as part of the NO_x modification at the Sodium Component Test Installation (SCTI). The second is installation of Flow Sensor EH-211 on the preheat air duct on SCTI.
  - The contract for both jobs requires each company to implement their QA plan, including submittal of material certification, procurement control, vendor approval, identification of nonconformances, and records control.
  - No material documentation was available for either job. The lack of material certifications for the insulation job has been identified by ETEC on a "squawk" sheet.
  - The QA manager for the Flow Sensor Installation stated that no Purchase Order or Certificate of Conformance was available for the NEMA 4 items they had installed.
- A tritium chemistry target was recently surveyed by an unapproved vendor, without the use of procedures, and by personnel not certified as qualified by ETEC.
- The following concern was not addressed in the ETEC Self-Assessment.
- See Concerns QV.1-5 and PP.4-1.

CONCERN: (QV.2-1) (H2/C1) **Items and services are procured from unapproved sources without specified quality requirements, as required by ETEC Procedures and ANSI/ASME NQA-1. Where quality requirements had been invoked, they have not been consistently enforced.**

QV.3 RECEIVING AND PRE-INSTALLATION INSPECTIONS

PERFORMANCE OBJECTIVE: Provisions should be established for the inspection of purchased material, equipment, and services in accordance with documented procedures by trained personnel.

FINDINGS:

- Receipt inspections are performed when specified in procurement documents or QA plans, and are charged to the item's designated project. Most inspections are Code 2-1C, Identification and Shipping Damage. Critical attributes of dimensions or function are not verified. Inspections are limited in an attempt to reduce project cost.

- The receipt inspection for some Pressure/Flow transducers was reviewed. The transducers were inspected as required by Code 2-1C, accepted and vendor payment authorized. The QV inspector performed no verification of critical attributes. The transducers were then sent to the Instrumentation and Standards (I&S) lab, where they were functionally tested, calibrated, and determined to be working and usable. The I&S lab actually performed the inspection for acceptance <u>after</u> the items had been accepted by QV. Deficiencies or nonconformances are therefore not identified before accepting an item.

- ETEC program managers attempt to reduce inspection in order to minimize charge-backs for inspection services.

- ANSI/ASME NQA-1 defines inspection as "examination or measurement to verify whether an item or activity conforms to specified requirements."

- The following concern was not addressed by the ETEC Self-Assessment.

- See also Concern QV.1-2.

CONCERN: (QV.3-1) (H2/C1) **Most receipt inspections do not verify critical attributes of items as required by ANSI/ASME NQA-1.**

QV.4 CALIBRATION PROGRAM

PERFORMANCE OBJECTIVE: Provisions should be made to ensure that tools, gauges, instruments, and other measuring and testing devices are properly identified, controlled, calibrated, and adjusted at specified intervals.

FINDINGS:

- Many instruments in the Sodium Component Test Installation (SCTI) control room have exceeded their calibration due date, but are not labeled as such. Instruments include burner control/monitoring devices, ammeters, flash tank level, and weather monitoring equipment. Although the plant is in the startup mode, these items are in use, and have operational and safety impacts.

- The Instrumentation and Standards (I&S) laboratory was reviewed, and all groups (working with electrical, pressure, linear, and temperature I&S aspects) displayed a high level of professional knowledge and skill. Standards are well maintained and controlled. Each work area has separate temperature and humidity monitoring. Standard electrical cells are maintained in the special cell enclosures. The average experience level is over 20 years, with many staff members nearing retirement. The high skill level could be lost if selection and training of new personnel do not begin soon.

- Much of the equipment and instrumentation used in the chemistry lab are out of calibration, some over 10 years.

- Standards used to standardize items in the chemistry lab are not traceable to NIST.

- The Health Physics/Radiation Protection Calibration Lab (Bldg. T011) represents a solid calibration program for items that are brought into the building for service. Written procedures are used, standards are traceable, and personnel are knowledgeable of technical requirements, including error and precision. They are not trained on and do not calibrate the Health Physics Counting Equipment in Bldgs. T020 and T100. They were not aware of the nonconformance system at ETEC.

- Health Physics Lab counting equipment is fully calibrated only when performance has degraded to the point of unacceptability.

- The ETEC Calibration Recall and Inventory System (CRIS) lists over 500 items that are overdue for calibration recall.

- The following concern was not addressed in the ETEC Self-Assessment.

- See also Concern QV.1-8.

CONCERN: (QV.4-1) (H2/C1) **Many measuring and test items not calibrated in Bldgs. T066 or T011 are either used in an uncalibrated status or are standardized without procedures or traceable standards, contrary to ANSI/ASME NQA-1.**

QV.5 IDENTIFICATION AND CONTROL OF HARDWARE/MATERIALS

PERFORMANCE OBJECTIVE: Provisions should be established to identify and control the use or disposition of hardware, materials, parts, and components as well as to ensure that incorrect/defective items are not used.

FINDINGS:

- An annunciator PC board in the control room had "No good 3/15/91" marked on its plastic bag. The annunciator panel printed circuit boards were later tracked down and found to be in a cardboard box in the I&S lab where they will be repaired and returned to operation as spares. Although these items meet the definition of nonconformance as defined in ETEC Procedure 2-20, "Nonconformance Control and Corrective Action," no Nonconformance Report (NCR) was initiated. These cards routinely fail, are repaired, and are returned to service without any written identification or failure analysis.

- A cardboard box with approximately 20 annunciator PC cards was observed in SCTI room 109, next to the control room. These cards were not identified or tagged to indicate status or usability.

- One standard cell in use in the I&S was out of tolerance in 1987. Lab personnel were unaware of this. When it was called to their attention, they indicated an NCR would be initiated now to evaluate the effect. The effect is expected to be negligible; the error was 3x10-7 volts.

- Several 440-volt panels with exposed wiring were noted. (See Concern WS.4-4.) This has resulted in dangerous noncompliances existing over extended periods of time.

- The following concern was addressed in the ETEC Self-Assessment.

CONCERN: (QV.5-1) (H1/C1) **ETEC equipment and material are not controlled as required by DOE 5700.6B and ANSI/ASME NQA-1, including early detection and correction of deficiencies.**

FINDINGS:

- ETEC managers are responsible for reviewing events and nonconformances to determine if an Unusual Occurrence Report (UOR) is warranted per DOE 5000.3A. No training program has been developed or presented at ETEC on Nonconformance Report (NCR) UOR responsibilities.

- A review was conducted of unplanned plant trips and nonconformances for the past 30 months. Fifteen (13 at SCTI) unplanned plant trips were not reported in conjunction with UORs. One of these UORs, at the Thermal Transient Facility (TTF), involved a 300-gallon oil spill, yet was not reported as required by DOE 5000.3A and SAN MD 5000.3.

- All personnel on site are responsible for identifying nonconformances and initiating NCRs, yet site personnel receive no formal training on the NCR system.

- Chemistry lab personnel are unaware of the system for reporting nonconformances or unusual occurrences.

- Radiation Protection/Health Physics personnel are often the first to detect personnel contamination that would require reporting under the UOR system, yet they are unaware of UOR and NCR procedures.

- ETEC Procedure 2-20, Rev. E (March 7, 1990) requires the program/project manager to determine if a reportable condition exists <u>after</u> a disposition and corrective action has been taken. This conflicts with ETEC meeting the reporting requirements of DOE 5000.3A: 2 hours verbal notice and 24 hours written.

- ETEC Procedure 2-20 has two Part IIs. The Part II dealing with construction squawk reports (CSRs) states that the CSR is to be used in place of the NCR during construction. Only Quality Verification can initiate a CSR. This defeats the policy of each employee taking responsibility for identifying nonconforming conditions. There is no capacity to evaluate the CSR for potential UOR reportability. (See also Concern QV.1-7.)

- This has resulted in unusual occurrences not always being reported to DOE.

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concern TC.10-1.

CONCERN: (QV.5-2) (H3/C1) **ETEC personnel do not understand their responsibilities to evaluate and report deficiencies as required by ETEC Procedure 2-20, DOE 5000.3A, and DOE 5700.6B.**

FINDINGS:

- The SCTI "Back Yard" and the adjacent Bldg. T357 are used to store stock materials and spare parts for SCTI. Material condition and storage in these areas does not meet ETEC Procedure 4-01, "Storage and Control of Material." Stainless ASME Code Reactor Development & Technology (RDT) material is stored in contact with rusted carbon steel, resulting in degraded or unusable material.

- Lubricants and preservatives are stored outdoors, with loose covers and rusted containers. No temperature control is provided. No shelf-life program is in existence.

- The Steam Accumulator Blowdown Evaluation Rig (SABER) facility is classified as "Active Standby." No maintenance program exists for this facility as required by ETEC procedures. The facility has three pressure vessels displacing a volume of over 2000 cubic feet each. Each is currently filled with gaseous nitrogen that is pressurized to over 2000 psig. These vessels represent a major potential for damage or injury if a failure should occur.

- Bldg. T901 is used for storage of parts and spares for SABER. It had carbon and stainless steels in contact and mixed storage; many items did not have any identification, tags, or status indicators.

- Items stored in Bldg. T357 were not tagged or identified to indicate status. Special process materials (304L gas tungsten arc welding wire) were not controlled or status-identified. (See Concern MA.3-1.)

- The following two concerns were not addressed in the ETEC Self-Assessment.

- See Concern OA.7-3.

CONCERN: (QV.5-3) (H2/C1) Items and material at ETEC are not identified, stored and handled to ensure that only proper items are used as required by ETEC Procedure 4.01, "Storage and Control of Materials," and ANSI/ASME NQA-1.

CONCERN: (QV.5-4) (H2/C1) Items, components, and material at ETEC are not handled and preserved to prevent degradation as required by ETEC Procedures and ANSI/ASME NQA-1.

QV.6 INSPECTIONS

PERFORMANCE OBJECTIVE: Prerequisites should be provided in written inspection procedures with provisions for documenting and evaluating inspection results.

FINDINGS:

- There is only one inspector at ETEC to cover all activities on a site with 24-hour/day and 7-day/week operations.
- Although the QV inspector is certified in some nondestructive examination (NDE) disciplines per the American Society for Nondestructive Testing (ASNT) TC-1a, he is not certified in any inspection discipline.
- There is no formal training and qualification program for inspection or other QV personnel as required by ANSI/ASME NQA-1, Section 10S-1.
- The first concern below was not addressed in the ETEC Self-Assessment; the second, however, was noted.
- See also Concerns QV.1-10 and QV.3-1.

CONCERN: (QV.6-1) (H2/C2) **Only a minimal inspection program is currently implemented at ETEC.**

CONCERN: (QV.6-2) (H2/C1) **Inspections are performed without the use of inspection procedures by uncertified inspection personnel. This does not meet the requirements of DOE 5700.6B and ANSI/ASME NQA-1.**

QV.7 CONTROL OF SPECIAL PROCESSES

PERFORMANCE OBJECTIVE: Provisions should be established to ensure the acceptability of special processes such as welding, heat treating, nondestructive testing, and chemical cleaning, and that special processes are performed by qualified personnel using qualified procedures and equipment.

FINDINGS:

- A construction contractor fabrication area had pieces of used welding electrode left around on the work tables and on the floor. Several different types of gas tungsten arc welding (GTAW) electrode were mixed on one work table. Two opened cans of shielded metal arc welding (SMAW) electrode of different types were left out to continuous atmospheric exposure and were not controlled to prevent use.

- Special processes, including GTAW and SMAW, are performed by maintenance personnel. The maintenance welder's job description allows for structural welds and "critical pressure" welds. It also states that welders are to "pass and maintain all civil code requirements necessary." The current maintenance welder has been certified in GTAW in the past, but his certifications lapsed in 1988.

- During this inspection, many examples were noted of uncontrolled special process material; this material was not identified or tagged to preclude improper use.

- The electrode storage oven in the maintenance shop was set at 150 °F. American Welding Society (AWS) D1.1 Code requires a setting of at least 250 °F for coated electrodes.

- The following concerns were not addressed in the ETEC Self-Assessment.

- See Concern QV.5-3.

CONCERN: (QV.7-1) (H3/C1) Special processes at ETEC are performed by personnel not certified in accordance with ANSI/ASME NQA-1.

CONCERN: (QV.7-2) (H2/C1) Special process materials at ETEC are not controlled as required by ANSI/ASME NQA-1 and AWS D1.1, "Structural Welding Code."

4.5.3 Operations

4.5.3.1 Overview

The appraisal addressed all eight performance objectives for the Operations functional area. Judgments were based on:

- Discussions with personnel in the two operations departments, from operators and mechanics through top managers
- Inspection of all operating facilities
- Observation of operations in progress, including shift turnover.

The organizational structures of the operations departments are well defined in the ETEC organization charts, and responsibilities and authorities for managerial, supervisory, and professional positions are outlined in written job descriptions. Management has established mandatory reading files and holds daily information meetings to keep personnel apprised of operations activities. However, there are no formally articulated safety awareness programs in the operations departments.

Control rooms and/or control stations are well organized, and activities therein are conducted in a professional manner. Access to the main control room is not limited, and some concern was expressed in the ETEC Self-Assessment that more control should be imposed. However, direct observation did not reveal that safety was at risk. A recognized, serious problem exists due to the lack of approved Operational Safety Requirements (OSRs) and their designation as the primary administrative controls over operations. This deficiency is being addressed, although even with the successful conclusion of the current project, not all phases of ETEC operation will be covered.

A carefully monitored system is in place to ensure the current status and accuracy of operating procedures. Again, the system suffers from the unavailability of OSRs, but that factor should improve with the successful completion and issuance of the Safety Analysis Document (SAD). New or modified procedures are validated through operational tests, and corrections are often made as a result. The practices for revising the procedures, however, are complicated and awkward, and their review led the Appraisal Team to express a concern that these practices do not allow for complete review of changes to procedures before implementation.

In general, facility status controls are managed properly. The control rooms and control stations are equipped with status and alarm monitors that were observed to function effectively. Logs are maintained to keep an accurate record of facility component status. New directives have been issued within the last 2 months to enhance the effectiveness of the ETEC lock-and-tag controls. Despite an extensive training program on the modified lock-and-tag system, however, there are deficiencies in maintaining accurate records.

Observation of the operations stations and equipment and examination of records revealed no fundamental safety risk from maintenance operations. However, discussions with Sodium Component Test Installation (SCTI) Operations Engineers indicated that the operations organization has difficulty in exercising necessary control over maintenance and troubleshooting activities performed on plant process hardware by personnel external to ETEC.

Discussions with operators (and their supervisors) indicated that they are knowledgeable of process fundamentals and well trained to execute their job assignments. Management has recently initiated a practice of walkthroughs designed to observe operator proficiency. But there is no ETEC-wide policy requiring the management walkthroughs, and those that are performed are informal, sporadic, and seldom documented. Also, as stated previously, OSRs are still in draft form and as a consequence Shift Leaders and operators have not received training in their use.

As confirmed by direct observation, shift turnovers are carried out efficiently and effectively. Currently, shift operations exist only in the SCTI facilities. Turnover checklists are reviewed by the incoming and outgoing Shift Leaders, as are the log entries from the concluding shift. Turnover between operators is less formal, but appears to ensure appropriate information exchange.

Human factors engineering has been informally integrated into the design of new or modified SCTI facilities. There is no evidence of significant deficiencies in operator/equipment interfaces.

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:

- Discussions with a group of Operations Engineers and Shift Leaders revealed the lack of a formally articulated and executed safety awareness program.
- Several mechanics assigned to the Sodium Component Test Installation (SCTI) reported that safety meetings are not regularly scheduled, although safety topics are often included in information meetings and some safety information is placed in their mandatory reading file.
- The Operations Engineers, Shift Leaders, and mechanics who were surveyed (a total of nine) could not cite current safety performance statistics for all of ETEC or for their own organization.
- This concern was not addressed in the ETEC Self-Assessment.
- See Concerns OA.1-2, OA.2-1, OA.3-1, and OA.6-1.

CONCERN: (OP.1-1) (H3/C2) **No formally articulated safety awareness programs exist in the operations departments.**

OP.2 CONDUCT OF OPERATIONS

PERFORMANCE OBJECTIVE: Operational activities should be conducted in a manner that achieves safe and reliable operation.

FINDINGS:

- Discussions with operations and project engineering managers indicated that Operational Safety Requirements (OSRs), which are required by SAN MD 5481.1A (September 20, 1989), have not been approved or issued for ETEC operations.

- Proposed OSRs for the new additions to the Sodium Component Test Installation (SCTI) have been drafted and are circulating for review as Appendix A of the Safety Analysis Document (SAD) for the SCTI (355-ZR-0021, Draft). Bases for the OSRs are included, although they are not cross-referenced to specific sections of the SAD.

- There is no current effort underway to prepare OSRs for existing systems at SCTI or for other ETEC general operations facilities.

- The concern referenced below was addressed in the ETEC Self-Assessment (Vol.1, p.2.5-6).

CONCERN: See Concern TS.2-1.

OP.3 OPERATIONS PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Approved written procedures, procedural policies and data sheets should provide effective guidance for normal and abnormal operation of each facility on a site.

FINDINGS:

- Operating procedures are revisable by inserting into their documented form written, red-line changes during actual testing or other circumstances. The written changes become official when approved by the Cognizant Engineer, the person in charge (PIC), and anyone else whose approval is considered necessary and who is so designated by the Cognizant Engineer. (Approval is indicated by initials and the date in the margin of the procedural document.)

- The system for recording such changes requires that the change originator notify the procedures file clerk, who is responsible for obtaining approvals and including all approved changes in procedural file copies, as well as destroying all uncorrected copies.

- If too many red-line changes have been made to a document, the QA reviewer may decide that the procedure itself may be at risk of compromise and may specify that a new printed version be prepared.

- Discussions with the procedure file clerk and the SCTI Facility Manager indicated a degree of awkwardness in keeping the red-lined procedures current and communicating the approved red-lined changes to all affected personnel. Furthermore, the review process for changes lacks the formality that this important control aspect mandates.

- The concern cited below was not addressed in the ETEC Self-Assessment. However, a discussion with the SCTI Facility Manager indicated that he was aware of the system's complexity and was moving to improve the system control.

- See Concerns OA.7-2 and QV.1-7.

CONCERN: (OP.3-1) (H2/C2) **The practice of revising operating procedures by piecemeal red-lining does not allow for complete review of changes before implementation.**

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.

FINDINGS:

- New Program Operations Department Directives (PODDs) were issued recently to enhance the effectiveness of the ETEC lock-and-tag controls. These directives are PODD-5, "Equipment Clearance and Release Order" (ECRO), February 6, 1991, and PODD-6, "Use of Caution Tags," March 18, 1991.

- Formal training and orientation have been given to Sodium Component Test Installation (SCTI) personnel on the new system requirements. However, a check of the system application and logbooks revealed a number of noncompliances, specifically:

  - One Auxiliary Tag had the wrong ECRO number.

  - Two cases were noted where the requester for the Equipment Release and the PIC (person-in-charge) were indicated to be the same person, which is a violation of the "independent verification" principle.

  - Three cases were found in which the requester had not signed the Equipment Release statement.

- The concern cited below is not articulated in the ETEC Self-Assessment, although concern for the general subject is addressed (Vol.1, p.2.5-6).

- See Concern TC.4-2.

CONCERN: (OP.4-1) (H2/C2) **The implementation of the new Program Operations Department Directives (PODD-5 and PODD-6) on the ETEC lock-and-tag programs does not ensure accurate documentation of the process.**

OP.5 OPERATIONS STATIONS AND EQUIPMENT

PERFORMANCE OBJECTIVE: Operation stations and facility equipment should effectively support facility operation.

FINDINGS:

- Discussion with Sodium Component Test Installation (SCTI) Operations Engineers indicated that the operations organization has difficulty in exercising necessary control over maintenance and troubleshooting activities performed on plant process hardware by Rocketdyne Plant Services personnel.
- Specific examples (provided by the Operations Engineers) for which proper control could not be exercised include:
  - Procedures used
  - Components replaced
  - Post-maintenance testing
- This concern is not addressed in the ETEC Self-Assessment.
- See Concerns OA.4-1 and MA.1-2.

CONCERNS: **Interfaces between ETEC operations personnel**
(OP.5-1) **and Rocketdyne Plant Services have not**
(H2/C2) **established sufficient operations control for maintaining operations stations.**

OP.6 OPERATOR KNOWLEDGE AND PERFORMANCE

PERFORMANCE OBJECTIVE: Operator knowledge and performance should support safe and reliable operation of the equipment and systems for which the operators are responsible.

FINDINGS:

- As cited earlier in this report, Operational Safety Requirements (OSRs) have been drafted for some ETEC operations. (See Section OP.2.) However, they have not been approved and issued.
- Discussions with Sodium Component Test Installation (SCTI) Shift Leaders and mechanics indicated that they have not been briefed or oriented as to the significance of OSRs or their application to the administrative control system.
- Operations management is aware of the need to train all operations personnel in the use of OSRs to control processes, as stated by the SCTI Facility Manager.
- The need to respond to the concern cited below was acknowledged in the ETEC Self-Assessment (Vol.1, p.2.5-6).

CONCERN: (OP.6-1) (H2/C2) **Shift Leaders and operators have not received training on the use of Operational Safety Requirements as the primary administrative control documents.**

4.5.4 Maintenance

4.5.4.1 Overview

The information for the appraisal of ETEC maintenance was obtained from interviews with ETEC and Rocketdyne personnel, from tours of key facilities and from review of ETEC, Rocketdyne, and DOE Procedures and policy documents. Interviews were conducted with managers and craftspersons from Rocketdyne Plant Services, managers of the ETEC Facility Programs, and managers and test operators from the two primary operating organizations: namely, Sodium Component Test Installation (SCTI)/Power Pak Test Operations and General Programs Test Operations. Numerous facilities were visited. However, the appraisal focused on the Rocketdyne Plant Services Maintenance shops, the SCTI (Bldg. T355), the Fragility Test Facility (Bldg. T013), the Steam Accumulator Blowdown Evacuation Rig (Bldg. T924), the Radioactive Materials Disposal Facility (RMDF), and the Sodium Burn Facility (Bldg. T133). All eight performance objectives were addressed.

Maintenance performed by Rocketdyne Plant Services on buildings, utilities, and grounds was found to be generally good. However, instances were noted where the operations organizations have had problems in exercising necessary control over maintenance activities performed by Rocketdyne Plant Services on plant process hardware. All Rocketdyne Plant Services maintenance shops were clean, well equipped and were operated effectively to perform the maintenance function. However, spot checking of corrective and preventive maintenance activities in the field revealed several deficiencies in maintenance procedures. Instances were noted where backup power sources including diesels and batteries were tested using improper procedures. In other instances, standard spares were not available at the job site and improper lockout/tagout procedures were employed.

While the maintenance of ETEC facilities is the responsibility of ETEC Facility Programs, it has been largely turned over to Rocketdyne Plant Services and is not effectively managed or reviewed by ETEC. This was noted in the Self-Assessment and is being corrected.

The maintenance of experimental equipment and test assemblies is the responsibility of the ETEC operating organizations. In the past, such organizations delegated this responsibility to maintenance groups. However, under the current organizational arrangement, test operators perform the dual function of maintenance and operations. This has resulted in problems in achieving continuity between shifts and in ensuring proper emphasis on maintenance. In some instances, Rocketdyne Plant Services and outside contractors have been brought in to provide additional maintenance support.

The overall ETEC maintenance policy, organization, and procedure are poorly documented with respect to the requirements of DOE 4330.4. As a consequence, the organizational structure and group responsibilities are poorly defined and, in some cases, not fully understood. This problem has been noted in the ETEC Self-Assessment and is being addressed. Essentially, none of the ETEC facilities have a documented or fully implemented maintenance plan and, in most instances, corrective and preventive maintenance procedures are incomplete or nonexistent.

The primary operating facility at ETEC is SCTI, which is currently in a startup mode after a shutdown for modifications. The status of this facility from a maintenance standpoint was considered poor, with numerous instances of faulty or inattentive maintenance including: loose panels, missing fasteners, loose insulation, missing lights, defective slings, poor parts control, untidy shop and storage areas, and the like. This situation is undoubtedly due to recent construction activities. However, many of the deficiencies appeared to have been in existence and unattended to for a considerable length of time. At this facility, and at other ETEC facilities, efforts are underway to establish a complete set of maintenance procedures. However, at this time, many such procedures are still unavailable or incomplete. The exceptions are the instrument calibration procedures, which are considered excellent.

Many ETEC facilities are designated as inactive, or as inactive or active standby. These facilities are provided with essentially no maintenance or inspection and have not been properly mothballed. Serious deterioration has resulted. In some cases, these buildings contain hazardous conditions, including pressurized systems, contamination, hazardous materials and faulty, energized, electrical panels. Access to these buildings is not effectively controlled and inspections are not done at short enough intervals to allow the identification and correction of these problems in a timely fashion; consequently, a hazard to personnel exists. In addition, some instances were noted when management was unaware of the status of these facilities and the responsibility for corrective measures. In most cases, insufficient funding was cited as the reason for the generally poor state of the inactive buildings.

4.5.4.2 Findings and Concerns

MA.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

FINDINGS:

- DOE 4330.4 requires that a documented maintenance program be established at all sites. ETEC has certain elements of a maintenance program in place, but is currently not in full compliance.
- ETEC has prepared procedures that describe the methods and organizational responsibilities for the maintenance of real property and test facility operating equipment in response to DOE 4330.4. These procedures have not been fully implemented.
- This concern was addressed in the ETEC Self-Assessment.
- See Concern OA.7-3.

CONCERN: (MA.1-1) (H2/C1) **ETEC is not in full compliance with DOE 4330.4, or with ETEC maintenance procedures in that it does not have a documented ETEC maintenance plan.**

FINDINGS:

- Individual ETEC facilities do not have definitive documented maintenance programs as required by ETEC Procedure 2-30, Revision B, February 4, 1991, "Management of Real Property Maintenance Programs" and ETEC Procedure 6-05, Revision D, February 12, 1991, "ETEC Test Facility Maintenance Programs."
- The maintenance program for utilities, buildings, and grounds is conducted by Rocketdyne Plant Services, which has a primary role in planning these activities. The ETEC Facility Programs organization does not play an active role in establishing requirements, managing, or tracking these activities.
- ETEC does not have an overall policy that clearly defines the maintenance requirements for each class of facility including active, inactive, and active or inactive standby.
- In some instances, the individuals responsible for ETEC facilities, particularly inactive facilities, were unsure of the facility status and the related maintenance requirements.

- The SCTI Operations Organization indicated that it has had difficulties in exercising the necessary level of control over maintenance and troubleshooting activities performed by Rocketdyne Plant Services. (See Section OP.5).

- Instances were noted where the interface between Rocketdyne Plant Services and ETEC was unclear from the standpoint of maintenance responsibilities.

- The following concern was addressed in the ETEC Self-Assessment.

- See also Concerns OA.1-1, OA.4-1, and OP.5-1.

CONCERN: (MA.1-2) (H2/C2) **The overall ETEC maintenance program and organizational structure, including the relationship with Rocketdyne Plant Services, is not well defined or understood.**

FINDINGS:

- Inactive ETEC facilities have not been properly mothballed and are not being maintained in a fashion to control deterioration.

- Most of the active ETEC facilities are relatively old and require increasing amounts of maintenance. The general status of these facilities is poor, indicating that the resources devoted to maintenance have not been sufficient or have not been used effectively.

- The following concern was noted in the ETEC Self-Assessment.

CONCERN: (MA.1-3) (H2/C2) **The maintenance program conducted by ETEC on active and inactive facilities has not been effective in preventing the deterioration of these facilities.**

FINDINGS:

- SCTI and other ETEC test facilities have in the past had organizational groups responsible for maintenance. Currently, operating personnel perform both operating and maintenance functions.

- Operations personnel place emphasis on operational issues rather than maintenance issues.

- The current dual responsibility for operations and maintenance has resulted in problems in communication and coordination between crews, particularly during shift turnover.

- Maintenance operations are frequently preempted by operational requirements.

- This following concern was not addressed in the ETEC

Self-Assessment.

CONCERN: The current dual responsibilities of operators for maintenance as well as operation have resulted in plant maintenance items being deferred or neglected.
(MA.1-4)
(H2/C2)

MA.2 CONDUCT OF MAINTENANCE

PERFORMANCE OBJECTIVE: Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

FINDINGS:

- Maintenance of test equipment at the Sodium Component Test Installation (SCTI) was found to be deficient in many respects. Numerous instances were noted of loose insulation, faulty electrical enclosures, loose fasteners, defective gauges, missing lights, deterioration and leakage of gas lines, and the like.

- In many instances, the maintenance deficiencies noted did not appear to have received attention for a substantial period of time.

- ETEC maintenance activities were generally properly authorized and controlled. In many instances, however, considerable reliance was placed on verbal instructions and employee knowledge rather than documented procedures.

- Post-maintenance test requirements and certification of the satisfactory completion of maintenance work are handled in an informal fashion.

- There is an apparent lack of ownership or responsibility among maintenance personnel as indicated by the numerous deficient maintenance items that persist.

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concern WS.4-4.

CONCERN: (MA.2-1) (H2/C2) **In most cases, the conduct of maintenance on ETEC test equipment does not address deficiencies in a controlled fashion and does not effectively minimize deterioration of this equipment.**

MA.3 MAINTENANCE FACILITIES, EQUIPMENT, AND MATERIAL

PERFORMANCE OBJECTIVES: Facilities, equipment, and material should effectively support the performance of maintenance activities.

FINDINGS:

- Generally proper tools and equipment are available. However, instances were noted where improper or damaged slings, chokers, ladders, and support fixtures were employed. This was evident at the Sodium Component Test Installation (SCTI) and the Sodium Burn Facility, Bldg. T133.

- The SCTI maintenance shop is situated a substantial distance from the plant. As a consequence, maintenance personnel do not use it to the extent desired, and instead perform many maintenance tasks at work benches in the test facility. These areas are generally disorderly, poorly lit, or otherwise unsuited for maintenance activities. In contrast, the maintenance shops employed by the Rocketdyne Plant Services organization were clean and orderly and were being used in a effective fashion.

- Safety devices used by the Rocketdyne Plant Services organization are inspected and effectively controlled. However, no evidence of inspection was noted at SCTI where a defective nylon sling was observed and remained at the work site for several days after initially being identified. (See Concern WS.4-7.)

- At SCTI, small parts are stored in an interim storage area rather than in the warehouse. A means for part identification and control was not evident and the area was poorly lit and untidy. New and used parts were intermingled in a haphazard fashion. In contrast, the Rocketdyne Plant Services warehouse was orderly and well controlled.

- Excessive reliance is placed on the mechanics' knowledge of the equipment and parts rather than a formal parts control system. This approach is particularly risky when the knowledge resides with a few individuals who, in some cases, are reaching retirement age.

- Stock levels of spares are not maintained and are often ordered on an "as-required" or "crisis" basis.

- Excessive use is made of parts removed from other inactive equipment as a source of spares.

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concerns QV.5-3, PP.4-2, and QV.5-4.

CONCERN: (MA.3-1) (H1/C2)

Maintenance facilities and equipment at the SCTI and other ETEC facilities are substandard, particularly with regard to parts control and shop facilities.

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:

- An annual work plan and long-range work plan for facility maintenance have been prepared by ETEC Facility Programs and Rocketdyne Plant Services in accordance with DOE 4330.4, which requires field operations personnel to review and approve these plans, and June 1990 DOE correspondence, which requires changes in submittals of such plans. The above work plans were submitted to SAN in November 1990, where they are presently being reviewed.
- Overview and guidance from SAN has increased significantly within the last 6 months.
- This concern was not addressed in the ETEC Self-Assessment.
- See also Concern OA.5-2.

CONCERN: (MA.4-1) (H2/C1) **Facility maintenance activities at ETEC are currently being conducted without guidance or input from DOE with respect to planning for 1991 and with respect to long-range planning.**

FINDINGS:

- Work packages generally include sufficient detail; however, some instances were noted where excessive reliance was placed on worker knowledge and informal instructions rather than fully documented packages.
- In most instances, post-maintenance requirements and acceptance criteria are not documented as required by ETEC Procedure 6-05, "ETEC Test Facility Maintenance Programs," and are conducted in an informal fashion.
- ETEC maintenance personnel, particularly at SCTI, stated that a large percentage of their activities are conducted on a crisis basis rather than in accordance with detailed planning.
- Normally, planning and scheduling of maintenance activities by Rocketdyne Plant Services is done in an effective fashion; however, one instance was noted where personnel arrived at the job site without proper spares.
- This concern was not addressed in the ETEC Self-Assessment.
- See also Concern OA.7-3.

CONCERN: (MA.4-2) (H3/C2) In most instances, planning, scheduling, and work control for maintenance activities at the Sodium Component Test Installation (SCTI) and at other ETEC facilities are not conducted in compliance with ETEC Procedure 6-05.

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:

- Inactive facilities have not been properly mothballed and do not receive effective corrective maintenance.
- The inspection program conducted by the Rocketdyne Plant Services organization focuses on active facilities. Inactive facilities are inspected every other year. In many instances access by personnel to these facilities is not controlled. In several cases hazardous conditions were noted in inactive buildings and it was apparent that these relatively infrequent inspections were ineffective in noting and correcting these problems.
- This concern was addressed in the ETEC Self-Assessment.
- See also Concern QV.5-1 and Section AX.3.

CONCERN: **Periodic inspections and corrective maintenance**
(MA.5-1) **of inactive facilities do not preclude the existence of**
(H1/C2) **hazardous conditions, which contribute to the deterioration of these facilities.**

FINDINGS:

- The general status of SCTI from the standpoint of corrective maintenance was considered to be poor. Numerous instances were noted of loose insulation, unsecured panels, loose fasteners, defective gauges, missing lights, etc. To some extent similar conditions were noted in Bldgs. T013 and T133. It is recognized that most of these discrepancies are superficial in nature, but are symptomatic of more serious problems.
- To some extent, the status of SCTI can be attributed to the current construction activities. However, many of the problems noted were unrelated to construction and appeared to be unattended for a considerable length of time.
- The Power Pak Facility currently has no corrective maintenance procedures and relies on information from vendor manuals for corrective maintenance procedures.
- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: **The general upkeep and housekeeping at the**
(MA.5-2) **Sodium Component Test Installation do not meet**
(H2/C2) **good industry practices.**

MA.6 PREVENTIVE MAINTENANCE

PERFORMANCE OBJECTIVES: Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

FINDINGS:

- A preventive maintenance program is in effect at the Sodium Component Test Installation (SCTI). However, because the plant is in a startup and acceptance testing mode, the focus is on these activities rather than preventive maintenance, and many preventive maintenance tasks have been deferred. In addition, not all required preventive maintenance procedures have been completed and issued, as required by ETEC Procedure 6-05.

- During the initial tour, no documented preventive maintenance programs or procedures were noted at Bldgs. T013 and T133. On a subsequent visit, preventive maintenance procedures were located at Bldg. T013. However, the sign-off sheets indicated that these procedures had not been used between February 1988 and April 1, 1991.

- This concern was addressed in the ETEC Self-Assessment.

- See Concern OA.7-3 and Section AX.6.

CONCERN: (MA.6-1) (H2/C2) **ETEC facilities do not have fully implemented preventive maintenance procedures as required by ETEC Procedure 6-05.**

FINDINGS:

- The maintenance procedure for an air conditioner unit located on Bldg. T487 was a relatively simple check sheet. Several operating parameters were to be recorded, but no values or tolerances for the parameters were noted on the procedure.

- Preventive maintenance activities by Rocketdyne Plant Services personnel on two emergency diesels and two sets of battery power supplies were observed. Several improper procedures were noted. First, the battery cell voltages were checked with the battery charger on, which tends to mask a cell with low voltage. The diesel providing emergency power to SCTI was started manually rather than by simulating a power failure. This diesel and the one providing emergency power to the Power Pak were operated under partial load conditions rather than full load conditions.

- This Concern was not addressed in the ETEC Self-Assessment.

- See also Concern QV.1-7 and Sections AX.6 and AX.8.

CONCERN: **Preventive maintenance procedures being used by the Rocketdyne Plant Services organization do not, in some instances, demonstrate the operability of the equipment being tested.**
(MA.6-2)
(H2/C2)

FINDINGS:

- Preventive maintenance on an air conditioning unit on Bldg. T487 was observed. The electrical power was turned off but not locked out, in accordance with 29 CFR 1910.147, Control of Hazardous Energy, (Lockout/Tagout) while work was in progress. In addition, it was not properly tagged out while the maintenance personnel left the area and returned to the maintenance shop to pick up spare parts. This was corrected. The spare parts involved were belts and fuses, both of which would be anticipated to be on hand at the job site for a routine job of this nature.

- The following concerns was not addressed in the ETEC Self-Assessment.

- See also Concerns QV.1-7, QV.1-8, and PP.2-2.

CONCERN: **In some instances, Rocketdyne Plant Services personnel do not follow lockout procedures as required by 29 CFR 1910.147.**
(MA.6-3)
(H1/C1)

MA.7 PREDICTIVE MAINTENANCE

PERFORMANCE OBJECTIVE: Maintenance history evaluation and systematic root cause analyses should be used to support maintenance activities and optimize equipment performance.

FINDINGS:

- Maintenance history records are contained in log books. These have not been organized and completed to facilitate development of predictive maintenance information.
- No systems are in place to monitor age-related degradation of systems, components, and structures in inactive facilities to predict special maintenance requirements.
- No instances were noted where historical records have been employed and systematic root cause analysis performed to anticipate and refine maintenance requirements.
- This concern was not addressed in the ETEC Self-Assessment.
- See also Concern TS.4-1.

CONCERN: (MA.7-1) (H3/C2) **Predictive maintenance is not used to develop and refine maintenance procedures.**

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:

- Sodium Component Test Installation (SCTI) maintenance records were found to be loosely stored in cardboard boxes in Bldg. T357. This is contrary to the requirements of DOE 1324.2. This was believed to be a temporary situation while these records are being transferred to the historical file format; however, at this point in time they were unacceptably vulnerable to loss or damage.

- ETEC Procedure 6-03, Rev. L, "Preparation and Control of Test and Operation Procedures," (February 18, 1991), clearly describes how field procedures should be prepared and controlled. Some procedures, such as those used for instrument calibration, are in compliance with this procedure. Many other procedures, including maintenance procedures, are prepared with considerably less detail and depend more on employee experience and informal instructions.

- SCTI procedures that were sampled contained many red-marked changes and additions. It was extremely difficult to determine if these changes had been reviewed and approved in the proper fashion.

- Access to SCTI procedures stored in file cabinets in the building is not controlled. Procedures are removed without checkout cards or logout procedures.

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concerns OA.7-1, OA.7-2, OA.7-3, and QV.1-9.

CONCERN: (MA.8-1) (H3/C1) **Maintenance procedures at the Sodium Component Test Installation and other ETEC test facilities are not in every case prepared and controlled in accordance with DOE 1324.2 or ETEC Procedure 6-03.**

4.5.5 Training & Certification

4.5.5.1 Overview

This assessment covered eight of the 10 performance objectives for this appraisal area. Performance Objectives TC.2, Reactor Operations, and TC.6, Criticality Safety, were not applicable to activities at ETEC and were therefore not evaluated.

This assessment was conducted using performance-based methods that emphasize the effectiveness of program implementation rather than the programs themselves. Priority was given to observation of work-in-process, to determine if an adequate level of training and job requirement awareness was evident.

The results of this assessment indicate that ETEC training is a minimal program that does not meet the requirements of DOE 5480.20 or ANSI/ASME NQA-1. Key personnel assignments such as radiation protection technicians, inspection personnel, and chemistry technicians do not have training and qualification programs in place. Maintenance personnel do not have a formal training program. Personnel responsible for occurrence reporting to DOE have not been trained on occurrence determination. Many more examples exist.

The recent adoption of a new job position, ETEC Training Coordinator, should have had a positive impact on site training. The person assigned to this task still maintains several other site responsibilities, however, and cannot dedicate much time to training-related issues. The Training Coordinator has been given responsibility but no authority to ensure that personnel receive training.

ETEC management does not actively support training. In fact, some managers have not received training on, and are unaware of, some of their responsibilities. Until worker-through-management training is taken seriously by ETEC management, conditions that are detrimental to the ETEC mission and its personnel can be expected to persist.

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:

- Training and qualification/certification requirements do not exist for each work classification at ETEC.
- Training records are not stored in a systematic and auditable manner. Training records for individuals are stored in various locations, with numerous different methods for filing and retrieval. Some training is listed, e.g., by the individual presentation, by attendee name.
- Operations training often consists of reading a new procedure revision to operators as the procedure becomes effective.
- No clearly defined and understood training structure is in place at ETEC. Several people in different departments handle various training duties with little coordination.
- An individual has been appointed as "Training Coordinator" at ETEC. This person also functions in two other roles within the organization. Resources have not been allotted, and authority has not been established, to ensure an effective training program.
- A regular, ongoing training schedule is not utilized at ETEC.
- Instructor performance and program effectiveness are not routinely evaluated.
- No training performance indicators have been defined. (See Concern OA.5-1.)
- Rocketdyne trains many ETEC workers in activities that are not ETEC-specific. This includes confined space entry, management programs, fire extinguisher use, and many others.
- There is no program for certification of Rocketdyne instructors, and lesson plans are not available for all programs presented.
- The following concern was not addressed in the ETEC Self-Assessment.
- See Section PP.5; and Concerns OA.7-3, EP.3-1, FP.6-3, and FP.6-4.

CONCERN: (TC.1-1) (H2/C1)	**No comprehensive training and qualification program has been implemented at ETEC to meet the requirements of DOE 5480.20.**

TC.3 NUCLEAR FACILITY OPERATIONS OTHER THAN REACTORS

PERFORMANCE OBJECTIVE: The nuclear facility operator and supervisor training and certification programs should be based on DOE 5480.5, as applicable, and should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- Conduct of operations in the Sodium Component Test Installation (SCTI) control room is very informal. Access to the control room was not limited, nor was permission required by the shift leader prior to entering. (This situation has been changed as a result of this appraisal.) A log is maintained for personnel entering and leaving, but its use is not enforced.

- The SCTI Shift Leader was interviewed regarding the function and status of the Auxiliary Flash Tank Level Controller. The controller was in the "auto" mode, with a 50-percent reading and an 80-percent set point. The Shift Leader stated that this controller should not be activated for the existing plant condition. He referred to the operations procedure; the procedure selected did not list or refer to this controller. The Shift Leader then contacted the Facility Cognizant Engineer (FCE). The FCE referred to another procedure that identified that the controller should be in the auto mode with an 80-percent set point.

- Remote communications between the SCTI Shift Leader and the operators lack formality, including no identification upon answering and no readback of information.

- Training for operators has become less structured and effective. In the past, training was done in a separate training area using prepared lessons and visual aids. Current training is mostly a cursory review of a recent procedure change or document package. Determination of whether attendees actually absorbed the information presented is not consistently made.

- The following concern was addressed in the ETEC Self-Assessment.

- See Concerns QV.1-7 and OP.6-1.

CONCERN: (TC.3-1) (H2/C1) **Operations personnel training has not been effective, as evidenced by incorrect personnel actions and conduct of operations that does not meet DOE 5480.19.**

TC.4 GENERAL EMPLOYEE/PERSONNEL PROTECTION TRAINING

PERFORMANCE OBJECTIVE: General employee and personnel protection training programs should ensure that site/facility personnel, subcontractors and visitors have an understanding of their responsibilities and expected safe work practices, and have the knowledge and practical abilities necessary to effectively implement personnel protection practices associated with their work.

FINDINGS:

- No comprehensive training program has been implemented. (See Concern TC.1-1.)
- No training and qualification program exists for chemistry lab personnel, except for personnel using the x-ray units.
- Not all personnel at ETEC receive radiation orientation training.
- General employee radiation training consists of an approximately 15-minute videotape presentation. This presentation focuses on making people feel at ease in radiation areas rather than emphasizing individual responsibility for radiation exposure reduction.
  - The correct way to wear film badges is not addressed in the training.
  - No examination is given to determine if knowledge is imparted. The instructor dims the lights and leaves the room during the tape. A person who sleeps through the video could still be determined to have successfully completed the program.
- The following concern was not addressed in the ETEC Self-Assessment.

CONCERN: (TC.4-1) (H2/C1) **Some personnel may not know or understand that personnel protection safety information can be "certified" as evidence of successfully completing training. Successful completion of training need not require a demonstration of knowledge through practical or written examination as required by DOE 5480.20.**

FINDINGS:

- A portable diesel air compressor outside Bldg. T020 represented a substantial noise hazard when running. None of the mechanics wore hearing protection when working on the operating compressor.
- Numerous examples of hazardous conditions were noted during this assessment. (See Concerns QV.5-1, PP.3-2, PP.3-3, and PP.5-2.)

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concerns TC.1-1 and OP.4-1, and Section PP.5.

CONCERN: **(TC.4-2)** **(H2/C1)**	**Personnel protection training does not address and prepare workers for many occupational hazards and conditions present in the ETEC facilities, as required by OSHA regulations and DOE Orders.**

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 pre-employment screening quiz is given to prospective maintenance personnel. No program has been established or implemented for initial and continuing training.

- Special processes, including gas tungsten arc welding (GTAW) and shielded metal arc welding (SMAW), are performed by maintenance personnel. The maintenance welder's job description allows for structural welds and "critical pressure" welds. It also states that welders are to "pass and maintain all civil code requirements necessary." The current maintenance welder has been certified in GTAW in the past, but his certifications lapsed in 1988.

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concerns TC.1-1 and OA.7-3.

CONCERN: (TC.5-1) (H3/C1) **A maintenance training and qualification program has not been implemented to meet ETEC Procedure 6-05, DOE 5480.20, and DOE 5480.19.**

TC.7 TRAINING FACILITIES AND EQUIPMENT

PERFORMANCE OBJECTIVE: The training facilities, equipment, and materials should effectively support training activities.

FINDINGS:

- No specific training facility has been designated at ETEC.
- The following concern was not addressed in the ETEC Self-Assessment.
- See Concern TC.1-1.

CONCERN: (TC.7-1) (H3/C2) **No training support facility with equipment and materials is available at ETEC to support training functions.**

TC.8 QUALITY CONTROL INSPECTOR AND NONDESTRUCTIVE EXAMINATION TECHNICIAN TRAINING

PERFORMANCE OBJECTIVE: The quality control (QC) inspector and nondestructive examination (NDE) technician training and qualification programs should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- Only one inspector is assigned to ETEC. Although this inspector is certified on some nondestructive examination (NDE) disciplines per American Society of Nondestructive Testing (ASNT) TC-1a, he is not certified in any inspection discipline.

- The following concern was addressed in the ETEC Self-Assessment.

- See Concerns TC.1-1 and QV.6-1.

CONCERN: (TC.8-1) (H3/C1) **There is no formal training and qualification program for inspection or other quality verification personnel as required by ANSI/ASME NQA-1 and DOE 5480.20.**

TC.9 RADIOLOGICAL PROTECTION PERSONNEL

PERFORMANCE OBJECTIVE: The radiological protection personnel training and qualification program should develop and improve the knowledge and skills necessary to perform assigned job functions.

FINDINGS:

- No Radiation Protection or Health Physics personnel training and qualification program has been developed at ETEC.
- The following concern was addressed in the ETEC Self-Assessment.
- See Concern TC.1-1 and the Radiation Protection Overview.

CONCERN: (TC.9-1) (H2/C1) **Radiological protection personnel are not trained and qualified as required by DOE 5480.19 and DOE 5480.11.**

TC.10 TRAINING FOR SUPERVISORS, MANAGERS, AND TECHNICAL STAFF

PERFORMANCE OBJECTIVE: Training programs for supervisors, managers and the technical staff should broaden overall job knowledge of processes and equipment and develop supervisory and management skills.

FINDINGS:

- ETEC managers are responsible for reviewing events and nonconformances to determine if an Unusual Occurrence Report (UOR) is warranted per DOE 5000.3A. ETEC personnel have not been trained on DOE 5000.3A.

- Although all personnel on site are responsible for the identification of nonconformances and initiation of nonconformance reports (NCRs), no formal training is provided to site personnel on the NCR system.

- The Chemistry Lab manager has not been trained in radiation safety as required by DOE 5480.20, yet the lab stores tritium and has two x-ray devices. Lab personnel are unaware of the system for reporting of nonconformances or unusual occurrences.

- The following concern was addressed in the ETEC Self-Assessment.

- See Concerns OA.8-1, QV.5-2, TC.1-1, TC.4-2, and EP.3-1.

CONCERN: (TC.10-1) (H2/C1) **Ineffective training of supervisors and managers results in noncompliance with DOE 5480.20.**

4.5.6 Auxiliary Systems

4.5.6.1 Overview

The information for the appraisal of ETEC auxiliary systems was obtained from interviews with ETEC and Rocketdyne personnel, tours of key facilities, and reviews of relevant ETEC and Rocketdyne procedures. Managers and technicians were interviewed from the Sodium Component Test Installation (SCTI)/Power Pak Test Operations, Radiation Protection and Health Physics Services, Design and Component Engineering, and Rocketdyne Plant Services. Facilities visited included the SCTI (Bldg. T355), the Hot Laboratory (Bldg. T020), the ETEC Chemistry Laboratory (Bldg. T065), the Radioactive Material Disposal Facility (RMDF), and the Rocketdyne Plant Services Maintenance Shop. Eight of the nine performance objectives were addressed. Performance Objective AX.4, Storage and Handling of Fissile Material, was not applicable to current operations. Auxiliary Systems was not included in the ETEC Self-Assessment.

A complete and up-to-date set of safety assessment documents and Operational Safety Requirements is not available. Therefore, auxiliary systems are not defined or described and are not necessarily controlled according to the same fundamental criteria for design, engineering, operations, and maintenance as are applied to the primary process systems. However, the organization, equipment, and procedures for handling effluents and solid wastes were found to be in good condition and were carrying out this function in a properly controlled and documented fashion. An exception was noted in several inactive buildings where hazardous materials were stored under less than desirable conditions. Some problems were also noted with ventilation systems and vital power supplies. Operating procedures, control mechanisms, and general maintenance of the fume hoods in the ETEC Chemistry Laboratory were considered marginal with respect to the control of hazardous airborne material. In addition, auxiliary equipment at SCTI, comprising emergency diesel and battery power supplies, was tested using invalid or nonrepresentative procedures.

The SCTI employs many engineered safety systems, but they are not defined as such. They are part of the plant protective system and are maintained, tested, and otherwise checked for proper operation as part of the plant acceptance test procedures. However, since there are no current Operational Safety Requirements for this facility, there are no overall requirements given for engineered safety systems.

4.5.6.2 Findings and Concerns

AX.1 SYSTEMS REQUIREMENTS

PERFORMANCE OBJECTIVE: Auxiliary systems should be considered under the same functional criteria for design, engineering, operations, maintenance, and modifications as the structural, confinement, and primary process system of the facility.

FINDINGS:

- Sodium Component Test Installation (SCTI) auxiliary systems are not clearly identified or described.
- Safety assessment documents and System Design Descriptions that describe the plant are not current.
- Operational Safety Requirements are not in effect as required by SAN MD 5481.1A, therefore specific safety and performance requirements for auxiliary systems are not identified.
- The following concern was not addressed in the ETEC Self-Assessment.
- See also Concerns TS.2-1 and TS.2-3.

CONCERN: (AX.1-1) (H2/C2) **Auxiliary systems at the Sodium Component Test Installation are not identified as such, and functional requirements for these systems are not defined, documented, or maintained.**

AX.3 SOLID WASTES

PERFORMANCE OBJECTIVE: Solid hazardous wastes (including radioactive wastes) should be controlled to minimize the volume generated, and handled in a manner that provides safe storage and transportation.

FINDINGS:

- Radioactive material and hazardous wastes exist at several inactive or standby buildings, including Bldgs. T042, T922, and T923. Since these buildings are not rigorously maintained, the safe status of these materials is not ensured.

- The following concern was not addressed in the ETEC Self-Assessment.

CONCERN: **See Concern MA.5-1.**

AX.5 VENTILATION SYSTEMS

PERFORMANCE OBJECTIVE: Ventilation systems should reliably direct all airborne effluents from contaminated zones or potentially contaminated zones through cleanup systems to ensure that the effluent reaching the environment is below the maximum permissible concentration and is ALARA.

FINDINGS:

- Fume hoods located in the ETEC Chemistry Laboratory (Bldg. T065) are used to perform chemical analysis in support of ETEC operations. In several instances, acids and other solvents are used in the process, and vapors from these operations are exhausted through the hood exhaust system.

- The control of hazardous chemicals used in the laboratory and in the hoods is largely done by an inventory process rather than strictly documented procedures or operating limitations. However, analytical processes requiring the use of fume hoods for reactive chemicals and solvents are performed infrequently with less than one pound quantities of such solvents. As a consequence, the inventory method of accounting for emission from the hoods is valid as long as the throughput is controlled at these levels.

- The fume hoods are not provided with monitoring systems to determine if the exhaust air flow has been interrupted.

- The stated procedure in the event of an air flow failure is to turn off sources of vaporization and to close the hood.

- Mild acids are used in the hoods and are vaporized as part of the chemical process. Inspection of the exhaust system to assess the status of the exhaust ducting and other components has not been done.

- A large quantity of mercury (approximately one and one-half tons) is stored in two cabinets in Bldg. T065. The cabinets are locked and an exhaust system is installed, which is connected to the main ventilation system. No flow monitoring devices are in place and only superficial air analysis has been performed. No other assessment of mercury flux or capture is performed.

- The following concern was not addressed in the ETEC Self-Assessment.

- See Section TS.5 and Concerns TS.5-1 and PP.3-3.

CONCERN: (AX.5-1) (H2/C2) In some instances, operating procedures, control mechanisms, and equipment maintenance at ETEC facilities do not ensure control and containment of hazardous, airborne effluents.

AX.6 VITAL SUPPLY SYSTEMS

PERFORMANCE OBJECTIVE: The electric, water, and emergency power systems should reliably provide vital services as required by all facilities on the site.

FINDINGS:

- The testing of emergency diesels at the Sodium Component Test Installation (SCTI) (Bldg. T355) and Power Pak (Bldg. T228) was observed and several discrepancies were noted. The SCTI diesel was tested employing the manual start mode rather than auto start or test mode. This method does not demonstrate or test the diesel's ability to start under representative power failure conditions. In addition, this diesel and the Power Pak diesel were operated under minimum load conditions, so that their ability to carry the full rated load was not demonstrated.

- These diesels are occasionally operated against a full load as requested by SCTI operations. However, testing of the diesels is not part of the regularly scheduled routine preventive maintenance program.

- The testing and preventative maintenance of emergency control and power backup batteries at SCTI and Power Pak were observed. The intercell voltage was measured with the charger on, which effectively masks any variance in cell voltage.

- The following concern was not addressed in the ETEC Self-Assessment.

- See also Concern QV.1-7.

CONCERN: **See Concern MA.6-1.**

AX.8 ENGINEERED SAFETY SYSTEMS

PERFORMANCE OBJECTIVE: Engineered Safety Systems should be reliable and available to provide protection to the facility when required.

FINDINGS:

- Engineered safety systems exist but are not identified as such at the Sodium Component Test Installation (SCTI).

- Since the Operational Safety Requirements are not in place, testing and measurement in accordance with these requirements is not conducted. Instead, ETEC procedures pertaining to high pressure system safety and checklists developed during plant startup planning are used to define requirements for testing and measurement of safety protective systems.

- Engineered Safety Systems are composed of the Plant Protection System and, as such, are maintained, tested, and otherwise checked for proper operation as part of the plant startup sequence, rather than in accordance with Operational Safety Requirements.

- Procedures to demonstrate satisfactory start-on-demand systems such as the SCTI and Power Pak diesels and batteries do not result in proven operability. (See Section AX.6.)

- The following concern was not addressed in the ETEC Self-Assessment.

CONCERN: **See Concerns TS.2-1 and MA.6-2.**

4.5.7 Emergency Preparedness

4.5.7.1 Overview

This appraisal addressed all seven performance objectives in the Emergency Preparedness functional area.

The appraisal was accomplished through interviews with Rocketdyne Emergency Preparedness staff, various site contractor supervisors, members of the ETEC emergency management organization, SAN staff, and the fire department and security organizations. These interviews were used to ascertain how ETEC emergency response activities and the site emergency preparedness program were conducted, managed, controlled, and maintained. The team conducted an extensive review of emergency preparedness documents, safety analysis reports, past exercise critiques, appraisals, training program documentation, and supporting documents against the provisions of the DOE 5500 series, the DOE 5480 series, DOE 5000.3A, and applicable ANSI standards and good industry practices.

Rocketdyne has developed a Master Emergency Plan (MEP) that provides emergency instructions and a response capability to assist ETEC during emergencies or exercises. ETEC has not developed any emergency plan implementing procedures (EPIPs) to support Rocketdyne's MEP and to provide specific instructions to site contractor personnel during emergencies. These ETEC EPIPs should address the assignment of individual responsibilities, the activation of the satellite ETEC Emergency Operations Center (EOC) and emergency actions levels, and the provision of protective action recommendations for both onsite and offsite populations.

Rocketdyne has a very well-organized emergency response and preparedness program that provides ETEC with most necessary emergency response capabilities. ETEC does have a small satellite EOC, but lacks a well-trained emergency management organization. The emergency response teams are able to respond to hazardous material (HAZMAT) emergencies, but lack the necessary training to respond as a coordinated team.

The existing emergency planning training program should be upgraded to address the requirements of DOE N 5500.4 and DOE 5500.3. Lesson plans need to be developed and revised, as required. ETEC did not develop an Emergency Preparedness Training Program Description document that outlines emergency management and support team requirements, offsite emergency response organizations, news media, and state and local emergency management agencies.

During the Appraisal Team HAZMAT exercise, site contractor staff demonstrated the ability to respond, make required notifications, and cope with a very challenging and aggressive simulated HAZMAT emergency situation. One of the primary areas of concern is the lack of written documentation that is site specific and implements the contents of the existing Rocketdyne MEP. The Appraisal Team Exercise Scenario, which was developed by the Rocketdyne Fire Protection Department, was well written and provided all the necessary players with instructions to ensure information was available for the ETEC exercise participants to react to the various simulated emergency events. The post-exercise verbal and written critiques contain all the cited exercise improvements that were observed by various Appraisal Team members; the written critique is considered the best report developed for any Appraisal Team exercise.

Rocketdyne has two professional fire protection engineers, who have part-time assignments to develop, revise, maintain, and coordinate the Rocketdyne Emergency Preparedness and Response Program. They have the additional duty to develop an emergency preparedness program for ETEC. ETEC has no assigned emergency preparedness specialist. Consequently, the existing ETEC Emergency Preparedness Program is not in full compliance in addressing the requirements of DOE 5500 Series, DOE 5480 Series, and other applicable DOE Orders. These ETEC cited emergency preparedness improvements will require management support from both DOE and ETEC to acquire the necessary manpower, facilities, resources, and materials to complete this task.

SAN does not take an aggressive management and coordination role in assisting ETEC in their emergency preparedness program development. Specifically, SAN has not conducted the required emergency preparedness appraisals and oversight functions assigned in DOE 5500.1A; the onsite SAN staff do not attend emergency preparedness orientations or participate in all scheduled exercises and drills; and SAN has not developed a DOE-ETEC Emergency Management Plan and EPIPs for the ETEC operation to provide guidance in development these ETEC EPIPs.

SAN did not disseminate and require ETEC to comply with the provisions of DOE 5500.3 and Draft DOE 5500.3A. This administrative action was not coordinated with or approved by DOE Headquarters Program Support Offices (EH.41 or DP.9).

4.5.7.2 Findings and Concerns

EP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Emergency preparedness organization and administration should ensure effective planning for, and implementation and control of, site/facility emergency response.

FINDINGS:

- The ETEC emergency response organization is not formally identified in ETEC Emergency Plan Implementing Procedures (EPIPs). (See Section EP.2.)

- SAN has not conducted an annual emergency preparedness appraisal since 1988.

- Responsibilities and authorities for each member of the ETEC emergency management team have not been formally documented in the EPIPs. (See Section EP.2.)

- ETEC does not have a full-time emergency planning specialist assigned.

- The first two issues were not addressed in the ETEC Self-Assessment.

CONCERN: (EP.1-1) (H2/C1) **ETEC has not formally developed an emergency response organization as required by DOE 5500.3 and DOE N 5500.5.**

CONCERN: (EP.1-2) (H2/C1) **SAN has not conducted annual emergency preparedness appraisals for ETEC, as required by DOE 5500.1A.**

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:

- ETEC does not have a Master Emergency Plan (MEP), but uses the guidance established in the Rocketdyne MEP and its supporting policies.
- ETEC does not have emergency plan implementing procedures that enforce the provisions of the Rocketdyne MEP and are ETEC-specific.
- ETEC does not have any emergency plan implementing procedures (EPIPs) that address emergency assessment, emergency action levels, emergency classification system, notification and reporting of emergencies, protective action guidance, and recovery and re-entry operations.
- ETEC does not have any emergency planning administrative procedures that address review, revision, and distribution of controlled documents and surveillance of emergency equipment, resources, and materials.
- The SAN Site Office has not developed a SAN-ETEC emergency plan and EPIPs.
- These concerns were addressed in the ETEC Self-Assessment.
- See Concerns OA.7-2, OA.5-2, OA.7-3, and QV.1-7.

CONCERN: (EP.2-1) (H2/C1) **ETEC has not developed an emergency plan implementing procedures to address the provisions of the Rocketdyne Master Emergency Plan and the requirements of DOE 5500.2A, DOE 5500.3, and DOE N 5500.3.**

CONCERN: (EP.2-2) (H2/C1) **SAN is not in compliance with DOE 5500.1A in providing guidance to ETEC on emergency preparedness functions.**

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:

- ETEC has not developed an emergency preparedness administrative procedure to outline and address an emergency response training program that would include a training matrix and annual training schedule.
- Initial and annual training of the emergency management staff has not been conducted. (See Concern TC.10-1.)
- The effectiveness of the emergency preparedness training has not been periodically evaluated to make training program improvements.
- SAN personnel assigned to emergency response positions at ETEC have not received ETEC emergency response orientations.
- This concern was not addressed in the ETEC Self-Assessment.
- See Concerns TC.1-1 and OA.7-3.

CONCERN: (EP.3-1) (H2/C1) **The ETEC emergency planning training program is not properly documented, evaluated, upgraded, and maintained current as required by DOE 5500.3, DOE N 5500.5, and DOE 5500.1A.**

EP.4 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.

FINDINGS:

- ETEC has not developed an emergency preparedness administrative procedure to address scenario development, format, annual drill schedule, exercise objectives, and post-exercise activities (i.e., critiques both verbal and written).
- Quarterly communications drills have not been conducted.
- ETEC has not developed a drill and exercise master plan schedule such that over a period of time all the procedures, personnel, facilities, and onsite and offsite emergency response groups are involved and tested per the criteria established by DOE 5500.1A, DOE 5500.3, and DOE N 5500.5.
- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: **ETEC does not have an emergency planning exercise/drill program as required by DOE 5500.1A, DOE 5500.3, and DOE N 5500.5.**
(EP.4-1)
(H2/C1)

EP.5 EMERGENCY FACILITIES, EQUIPMENT, AND RESOURCES

PERFORMANCE OBJECTIVE: Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

FINDINGS:

- Adequate work space has not been provided in the ETEC satellite Emergency Operations Center (EOC). The EOC does not have sufficient documentation available to assist EOC support staff in performing their emergency response functions (i.e., Safety Analysis Documents, Material Safety Data Sheets, DOE and SAN Orders, ETEC procedures for normal and emergency operations, and health physics procedures).
- EOC status boards did not address all information needed to be presented to the EOC Emergency Manager and support staff. There was no method to capture the information displayed on status boards for historical purposes.
- The EOC does not have facsimile capability to transmit hard copy of reports to offsite agencies.
- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: (EP.5-1) (H2/C1) **The emergency response facilities at ETEC do not contain the resources, equipment, space, and materials to comply with DOE 5500.1A, DOE 5500.3, and DOE N 5500.5.**

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:

- ETEC has not developed emergency action levels (EALs) as required by DOE 5500.3 and DOE 5500.2A.
- ETEC does not have a procedure on protective action guidance for both onsite and offsite populations.
- ETEC does not have a procedure to address the emergency classification system, nor was this emergency plan implementing procedure (EPIP) coordinated with state and local emergency management agencies.
- The provisions of DOE 5000.3A, including proper reporting format, are not contained in a written procedure.
- Detailed EPIPs have not been developed to address the notification and reporting requirements of DOE 5000.3A.
- ETEC report format for reporting of emergency events has not been formally submitted to the state and local emergency management agencies for approval action.
- This concern was not addressed in the ETEC Self-Assessment.
- See Concern OA.7-3.

CONCERN: (EP.6-1) (H2/C1) **ETEC has not developed an emergency plan to implement procedures that address required notifications, emergency action levels, and an emergency classification system as required by DOE 5500.2A, DOE N 5500.5, and DOE 5000.3A.**

EP.7 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:

- ETEC has not developed a site evacuation procedure to provide an effective and tested procedure to ensure that protective actions can be accomplished.
- Not all ETEC assembly areas have a public address unit installed to provide instructions to assembled ETEC personnel during an emergency.
- ETEC report format for reporting of emergency events has not been formally submitted to state and local emergency management agencies for approval.
- This concern was addressed in the ETEC Self-Assessment.
- See Concern OA.7-3.

CONCERN: **ETEC has not developed procedures to address**
(EP.7-1) **personnel protection guidance for both onsite**
(H2/C1) **and offsite populations as required by**
DOE 5500.1A, DOE N 5500.5, and DOE 5500.3.

4.5.8 Technical Support

4.5.8.1 Overview

Appraisal activities consisted of interviews with site contractor staff members, primarily in the ETEC Engineering Department, Liquid Metal Programs Operations, and General Program Operations; reviews of manuals, safety documents, procedures, and files; and facility visits. Major facilities visited were the Sodium Component Test Installation (Bldg. T356), Thermal Transient Facility (Bldg. T013), Large Leak Test Rig (Bldg. T059), Sodium Burn Facility (Bldg. T133), and ETEC Chemistry Laboratory (Bldg. T065). The appraisal addressed five of the eight performance objectives in the Technical Support category: Organization and Administration, Procedures and Documents, Facility Modifications, Equipment Performance Testing and Monitoring, and Environmental Impact. The other three categories were either covered as a separate appraisal category (Packaging and Transportation of Hazardous Materials) or are not applicable to current ETEC operations (Reactor Engineering and Criticality Safety). Performance Objective FR.6, Operating Experience Review, was also appraised as part of the technical support appraisal and incorporated into Performance Objective TS.4, Equipment Performance Testing and Monitoring, with which it has much in common.

Overall, staffing, qualifications, and procedures of ETEC's technical support function are judged to provide appropriate levels of support. However, deficiencies were identified in SAR and Operational Safety Requirement (OSR) scope and content, review of safety-related documents, code and standard identification, equipment performance evaluation, and control and monitoring of environmental releases. Ten concerns were identified in the Technical Support category.

Technical support at ETEC is provided, primarily, by ETEC Engineering and by Project Engineering groups within the operations divisions. Some support, such as environmental sample analysis and machine shop services, is provided by Rocketdyne organizations. The technical staff members are well qualified in terms of education and experience. The size of the staff is sufficient for routine tasks, and it is supplemented, as necessary, with support from Rocketdyne engineers and a cadre of ETEC retirees. Responsibilities and interactions are well understood as a result of close working relationships among the various ETEC groups. ETEC manuals and procedures define duties and responsibilities for individual tasks, and general responsibilities and authorities are defined for all management and technical levels within the Rockwell International Corporation. However, responsibilities and authorities are not defined through written job or position descriptions for specific technical positions within ETEC. The ETEC Procedures Manual and the ETEC Department Directives Manual provide detailed guidance for activities that affect safe and reliable operation.

ETEC operations are covered by a number of SARs and Safety Analysis Documents (SADs). However, the contents and formats of these documents do not fully meet current guidance. At this time, none of the facilities have approved OSRs in place. A number of the ETEC facilities currently are inactive and, thus, probably have little or no need for OSRs or SAR/SAD updating. However, existing documentation of the review process does not demonstrate that ETEC has conducted formal evaluations of the adequacy of its existing safety documentation in addressing the risks, as required by DOE 5480.1B and SAN MD 5480.1A. Operations are conducted in accordance with written procedures, which undergo a formal review and release process. The procedures include safety requirements but do not include OSR requirements, since no OSRs exist. A formal policy and procedure governing the preparation, modification, and review of procedures are in place.

The site contractor technical staff provides all specialties necessary for design of facility modifications. Appropriate codes, standards, and regulations are generally used in designing facility modifications, but this depends largely upon the experience and expertise of the Engineering staff. ETEC has guidance on use of codes, standards, and regulations but does not provide a comprehensive review of all potentially applicable criteria. Design activities are governed by comprehensive and well-detailed procedures. Design changes undergo formal technical, interdisciplinary reviews and approvals. However, independent review/validation of some design documents, such as calculations, is required only when mandated by the Project Development Plan. Design changes are addressed in supplemental SADs, unless the ETEC Engineering Department documents a judgment that the change does not involve an unreviewed safety question. Operational readiness reviews are performed for each test or modification.

ETEC has a program and process for generating and distributing occurrence reports and nonconformance reports. ETEC also provides information to a DOE-sponsored program for reporting and compiling data on liquid metal system component performance, but has made limited use of the data. There is no structured, comprehensive program for compiling, trending, and evaluating equipment performance and operating experience. Such activities depend primarily upon the interest, awareness, and initiative of individual cognizant engineers. ETEC has no program for interchange of equipment performance information with other Rockwell organizations.

In general, ETEC management has taken reasonable measures to minimize quantities of radioactive and hazardous materials released to the environment. Control features include high-efficiency particulate air (HEPA) filters, scrubbers, and retention tanks to hold liquids until they can be sampled to determine appropriate disposal. One situation in which the exhaust system does not ensure filtration of potentially contaminated air and one instance in which monitoring methods do not provide accurate or sensitive measurements were identified.

4.5.8.2 Findings and Concerns

TS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: The technical support organization and administration should ensure effective implementation and control of technical support activities.

FINDINGS:

- Although general responsibilities and authorities are defined for all management and technical levels within the Rockwell International Corporation, responsibilities and authorities for specific technical positions within ETEC are not defined through written job or position descriptions.

CONCERN: See Concern OA.1-1.

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 should be properly and effectively used to support safe operation of all facilities on the site.

FINDINGS:

- None of the ETEC facilities have approved, in-place Operational Safety Requirements (OSRs).
- OSRs are being incorporated into the draft Safety Analysis Documents (SADs) being prepared for two projects: the Sodium Component Test Installation Double Walled Tube Steam Generator and Few Tube Test Module Facility Modification, and the Sodium Component Test Installation H-1 and H-2 Heaters and H-101 Boiler using NO_x Emission Control. However, efforts to develop the OSR format and content are still underway. The latest drafts exhibit some deficiencies in format and content with respect to safety limits, bases, surveillances, and response actions.
- The OSRs that are being prepared address only limits and controls related to the subject tests and modifications. The basic operations of the facility, however, are grandfathered under older safety criteria which did not call for OSRs.
- This concern was addressed in the ETEC Self-Assessment.
- See Concern AX.1-1; and Sections EA.2, AX.8, and OP.2.

CONCERN: (TS.2-1) (H2/C2) **Approved Operational Safety Requirements are not in place for ETEC facility operations.**

FINDINGS:

- For ongoing DOE operations which can be reasonably expected to have the potential for major onsite or offsite impacts to people or the environment, determinations of whether existing safety documentation adequately addresses the risks are required by DOE 5481.1B, Chapter I, Part 4 (May 19, 1987) and SAN MD 5481.1A, Chapter I, Part 4 (September 20, 1989). SAN MD 5481.1A, in Chapter II, Table 2, identifies major onsite impact as one that may cause death, severe injury, or severe occupational illness to personnel, or major damage to a facility/operation.

- ETEC has several safety documents that predate issuance of DOE 5481.1B and SAN MD 5481.1A, including GEN-ZR-0001 "Safety Hazards Report," April 30, 1985, which addresses most of the ETEC facilities. There are subsequent SARs and SADs for some of these facilities, but they typically address only modifications to the facility.

- Existing documentation of the review process does not demonstrate that ETEC has conducted formal evaluations of the adequacy of the safety documentation that existed at the time the DOE 5481.1B and SAN MD 5481.1A requirements were imposed.

- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: (TS.2-2) (H2/C1) **ETEC has not documented evaluations showing whether existing safety documentation "adequately assesses the risk," as required by DOE 5481.1B, Chapter I, Part 4, and by SAN MD 5481.1A, Chapter I, Part 4.**

FINDINGS:

- The contents and formats of ETEC SARs and SADs do not comply with the guidance of SAN MD 5481.1A, Chapter II, Part 2, for SADs. Before 1989 the ETEC safety documents were labeled as SARs; after that time the documents are SADs, which is consistent with SAN MD 5481.1A guidance for safety documents for low-hazard and moderate-hazard non-nuclear facilities/operations. The SARs issued before SAN MD 5481.1A was issued in September 1989 were not required to meet the currently specified format. However, since the subsequent SADs address only the changes to the facility and its operation, the impact of the more recent criteria on the safety assessment of the unmodified portion of the facility has not been demonstrated in the SAD. Specific deficiencies observed include:

  - Document GEN-ZR-0001, "Safety Hazards Report," April 30, 1985, does not contain OSRs. The Quality Assurance section of this report merely describes the overview role of the QA Department, and does not list the QA requirements.

  - Document 355-ZR-0013, "SCTI--Safety Analysis Report for Helical Coil Steam Generator Facility Modifications," September 3, 1985, contains neither OSRs nor a Quality Assurance section. Although the helical coil steam generator tests have been completed, this report is referenced in subsequent SCTI safety documents to supplement information in those documents.

- Document 355-ZR-0019, "Safety Analysis Report for Power Pak/SCTI," August 21, 1987, and Document 355-ZR-0020, "Safety Analysis Report for the SCTI H-2 Combustion Air Preheat System," March 18, 1988, both lack OSRs and Quality Assurance sections. Also, both reference separate documents ("System Design Description" and "Casualty Study," respectively) for details of events, initiators, effects, and protective features/actions rather than incorporating this information into the reports themselves.

- Document 355-ZR-0021, "SCTI Safety Analysis Document DWTSG and FTTM Facility Modifications," May 11, 1990, contains an OSR section, but this is merely a brief paragraph referencing another document for limits. The Quality Assurance section consists of a paragraph that states only that the test program is "being conducted in compliance with the applicable requirements of ANSI/ASME NQA-1 1989." There is no identification of which requirements are applicable or description of how compliance is achieved. Also, this report does not meet the DOE 5481.1B, Chapter I, Paragraph 3.a.(3) and SAN MD 5481.1A, Chapter I, Paragraph 3.b.(3) requirements that the safety analysis identify, demonstrate, and document conformance with applicable guides, codes, and standards.

- Draft Revision A to Document 355-ZR-0021, March 12, 1991, does include OSRs, but the Quality Assurance section and code-related deficiencies have not been corrected.

- This concern was addressed in the ETEC Self-Assessment.

- See Concerns QV.1-1 and AX.1-1.

CONCERN: (TS.2-3) (H2/C1) **The contents and formats of approved and draft ETEC SARS and Safety Analysis Documents do not fully comply with SAN MD 5481.1A guidance for Operational Safety Requirements, quality assurance, and details of safety analyses. Further, not all of these documents meet the DOE 5481.1B and SAN MD 5481.1A requirements for documentation of conformance with applicable guides, codes, and standards.**

FINDINGS:

- During seismic table tests in the Thermal Transient Facility in which high pressure nitrogen is used as an energy source, areas outside the building are barricaded to prevent persons from entering a potential missile danger zone. However, at the time the appraisal began, ETEC did not have available documentation of analyses showing that the previous zone dimensions were appropriate for the current programs. Calculations demonstrating the adequacy of the zone were performed after this question was discussed with ETEC Engineering.

- ETEC Engineering has a letter stating its judgment that the decontamination and decommissioning activities in Bldg. T059 introduce no new or increased hazards, and that a Safety Analysis Document is therefore not required for these activities. However, the Appraisal Team identified several safety concerns related to the decontamination and decommissioning activities, indicating that the safety review and analysis of the project were insufficient. (See Concerns PP.2-1, PP.3-3, and TS.5-1.)

- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: (TS.2-4) (H2/C2) **The ETEC safety analysis documents do not address all significant safety issues.**

TS.3 FACILITY 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 should assure proper design, review, control, implementation, and documentation in a timely manner.

FINDINGS:

- ETEC Engineering Department Directive EDD-10, "Checking of Engineering Documents," provides a clearly defined process and requirements for checking of drawings and supporting documents such as specifications and calculations. Table 1 of EDD-10 states that independent checking is required for drawings, but is optional for specifications, calculations, procedures, studies, and reports unless otherwise specified in the Project Development Plan.

- The ETEC Engineering Department Manager stated that independent validation of engineering calculations is performed only on a case-by-case basis.

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concerns OA.2-1 and OA.7-3.

CONCERN: (TS.3-1) (H2/C2) **ETEC does not have a clear requirement for validation of safety-related engineering calculations or independent review of engineering documents other than drawings.**

FINDINGS:

- ETEC Procedure 3-11, "Application of Codes and Standards," February 22, 1991, mandates review and use, as applicable, of a number of codes, standards, and criteria for facility design and construction, including DOE 6430.1A. However, DOE 5480.4 is not among the documents listed.

- Most of the mandatory codes and standards specified in DOE 5480.4 are included in DOE 6430.1A, but it is not clear that all are covered; there has been no systematic review by ETEC to determine if this is the case.

- ETEC Engineering Department Directive EDD-12, "Design Requirements," February 22, 1991, in Appendix A, Part 2.3, states that the design criteria preparer is encouraged to use DOE 6430.1A as a guide and checklist for selecting appropriate requirements and topics to be covered by the design criteria document. This advisory statement is not consistent with the mandatory use of DOE 6430.1A, where applicable, as specified in ETEC Procedure 3-11.

- ETEC has taken the position that ETEC design practices generally result in compliance with DOE 6430.1A and has requested, in an October 26, 1988, letter to SAN, approval to deviate from across-the-board application of DOE 6430.1A. To date, there has been no formal SAN response to this request. However, ETEC is proceeding in accordance with the proposed deviation.

- The following two concerns were not addressed in the ETEC Self-Assessment.

- See also Concerns OA.5-2 and OA.7-3.

CONCERN: (TS.3-2) (H3/C1) **ETEC direction on use of design codes, standards, and regulations mandated by DOE 6430.1A, Section 0106, and DOE 5480.4 does not provide a comprehensive review of all potentially applicable criteria.**

CONCERN: (TS.3-3) (H3/C1) **ETEC is proceeding in accordance with a requested proposal to deviate from across-the-board application of DOE 6430.1A, even though the requested deviation has not been approved by DOE.**

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:

- ETEC Engineering Department and Project Engineering managers who were interviewed stated that ETEC has no formal, comprehensive program for compiling, trending, and evaluating performance testing and monitoring data. There are elements, such as acceptance and startup tests, occurrence reporting, and nonconformance report count trending. However, evaluation of recurring problems for root causes or generic causes appears to depend upon the interest, perceptions, and databases of individual cognizant engineers who deal with plant problems. (See Section MA.7.)

- Internal events are reported in Occurrence Reports, which are distributed within and outside ETEC, and external Occurrence Reports are also received and distributed. However, there is no program for routinely obtaining other external information such as NRC letters, bulletins, information notices, or INPO operating experience information. (See Section OA.1.)

- Nonconformance report information is compiled and trended by the Quality Assurance Department, but the trend reports only identify trends in numbers and categories of nonconformances. (See Concern QV.1-3.)

- ETEC contributes information to the DOE-sponsored Centralized Reliability Data Organization (CREDO) program for reporting and compiling data on liquid metal program component performance. This program, managed by the Oak Ridge National Laboratory, has been in existence for about 15 years, and includes information from ETEC, Fast Flux Test Facility, Experimental Breeder Reactor II, and others. However, the ETEC engineering managers interviewed could recall only one instance in which the CREDO database had been used by ETEC.

- This concern was addressed in the ETEC Self-Assessment.

- See also Concerns MA.7-1, OA.5-1, and OA.5-6.

CONCERN: **ETEC has no formal, structured, comprehensive**
(TS.4-1) **program for compiling, trending, and evaluating**
(H2/C2) **all relevant equipment performance data.**

TS.5 ENVIRONMENTAL IMPACT

PERFORMANCE OBJECTIVE: The impact on the environs from the operation of each facility on the site should be minimized.

FINDINGS:

- Although the atmosphere of the greenhouse erected around the area where radioactive material is being removed during decontamination and decommissioning of Bldg. T059 is exhausted through high-efficiency particulate air (HEPA) filters, the atmosphere of the vacuum equipment room is not HEPA filtered before it leaves the building. There is a potential for this air to become contaminated if material escapes from the greenhouse. ETEC has recognized this as a deficiency, and a work order has been written to redirect the room exhaust to the filtered system.

- Although continuous air monitors are located in the rooms around the Bldg. T059 greenhouse to warn personnel of radioactive contamination spread, the air exhaust stream from the vacuum equipment room is not monitored. Thus, there is no capability to quantify radioisotope releases by this path.

- This concern was not addressed in the ETEC Self-Assessment.

- See Concerns AX.5-1 and PP.3-3.

CONCERN: (TS.5-1) (H2/C2) **Not all potentially contaminated air exhausted from Building T059 passes through high-efficiency particulate air filters, nor are all exhaust air streams monitored.**

FINDINGS:

- Location and configuration of sampling equipment for radioactive emissions from the Bldg. T059 greenhouse have not been analyzed to determine if the samples are meaningful.

- The sampling is performed by drawing air through a filter, which is counted weekly. The filter is at the end of a flexible tube, and is not placed at a fixed point in the exhaust stream. It was placed at an arbitrary location at the periphery of the exhaust stack exit, and has since been relocated to the center of the stack. Thus, reproducibility and accuracy of the data appear doubtful.

- This concern was not addressed in the ETEC Self-Assessment.

- See also Concerns PP.2-1 and RP.6-1, and Findings RAD/CF-2 and Air/CF-2 in the Environmental Subteam Report.

CONCERN: (TS.5-2) (H2/C2)	**Current air sampling practices do not ensure accuracy of radioisotope release data for Building T059.**

4.5.9 Security/Safety Interface

4.5.9.1 Overview

All four of the performance objectives included in the Security/Safety Interface category were addressed during this appraisal. Judgments were based upon:

- Discussions with personnel of the Rocketdyne Internal Security Department, especially those assigned to Protective Services at SSFL
- Discussions with SAN personnel assigned to ETEC
- Inspection of site security facilities
- Observation of the performance of Protective Services personnel during an Emergency Response drill.

Security facilities at SSFL that serve security activities at ETEC consist of one guard post, an outdoor firing range, and the Protective Services Control Center. None of these are located on the ETEC site. An engineering review process for safeguards/security improvements is not a subject of concern at ETEC at this time because no safeguard facilities exist at the ETEC site and none are planned.

An Emergency Response practice exercise demonstrated that access of emergency vehicles to and from the ETEC site is not impeded by Protective Services personnel. However, even though this practice is clearly understood, at the guard post entrance to SSFL, there were no instructions in evidence to give emergency vehicles unimpeded ingress and egress.

Since the removal of all reactor test fuel from the ETEC site, there are no conceivable safeguards emergencies. Consequently, security drills at ETEC have been discontinued by mutual agreement between ETEC management and Rocketdyne Security (Letter, P. D. Rutherford to W. I. Greenwell, September 4, 1990).

Rocketdyne Protective Services personnel carry firearms on the ETEC site despite the fact that SAN does not stipulate that requirement, as confirmed by both Rocketdyne and SAN management personnel. SAN has exempted the Rocketdyne Industrial Security Department from complying with DOE 5480.16 on Firearms Safety. This exemption relieves Rocketdyne of the responsibility to conduct formal annual audits of internal operations pertaining to the safety of the use of firearms. However, DOE 5480.16 also requires DOE elements (where applicable) to conduct similar firearms safety audits, and these audits are currently not being performed. Also, the California Department of Consumer Affairs, which registers Rocketdyne Protective Services personnel as guards and licenses them to carry weapons, has the right to audit the firearms safety program at SSFL. But the State of California has never conducted such an audit.

The training and retraining program for Rocketdyne Protective Services Officers complies with the requirements stipulated for registered guards by the California Department of Consumer Affairs. Other elements of the program, such as hazardous materials (HAZMAT) training, are well structured and well executed. Appropriately, special emphasis is placed on sodium metal hazards.

4.5.9.2 Findings and Concerns

SS.2 EMERGENCY ACCESS AND EGRESS

PERFORMANCE OBJECTIVE: Authorized facility and safety support personnel should not be denied access in an emergency. Egress during emergencies should be conducted according to approved preplanning.

FINDINGS:

- During an Emergency Response practice exercise, it was observed that access of emergency vehicles to and from the ETEC site is not impeded by Protective Services personnel. Discussion with Protective Services management confirmed the practice to be clearly understood.

- No instructions at the guard post entrance to SSFL specified that unimpeded ingress and egress were to be given to emergency vehicles.

- The concern cited below was not addressed in the ETEC Self-Assessment. Since the observation, the Post Orders (and the General Order Manual) have been amended to respond to the concern.

- See Concern OA.7-3.

CONCERNS: **Instructions stipulating unimpeded ingress and**
(SS.2-1) **egress of emergency vehicles were not included in the**
(H1/C2) **Post Orders of the guard post at the entrance to SSFL.**

SS.4 SAFETY OF SECURITY ACTIVITIES

PERFORMANCE OBJECTIVE: Safety aspects of security activities involving use of weapons and other protective force equipment in the vicinity of safety systems and/or hazardous processes and materials should be identified and understood by all involved parties.

FINDINGS:

- Rocketdyne Protective Services personnel carry firearms on the ETEC site despite the fact that SAN does not stipulate that requirement, as confirmed by discussion with Rocketdyne and SAN management personnel.

- By approving the Rockwell International Safeguards and Security Plan (December 15, 1989), SAN exempted the Rocketdyne Industrial Security Department from compliance with DOE 5480.16 on Firearms Safety, thereby relieving them of the responsibility to conduct formal annual appraisals and audits of their internal operations pertaining to the use of firearms. This requirement is normally imposed on contractors by DOE 5480.16, Chapter III (Operational Assurance), Section 1.b.

- DOE 5480.16, Chapter III, Section 1.b. also requires that "where applicable, DOE elements shall conduct formal appraisals and audits ...." However, neither SAN nor any other DOE element is currently conducting an annual appraisal of firearms safety at the ETEC site. (See Concern OA.5-2.)

- Discussions with Rocketdyne Protective Services management indicated that Protective Services personnel are registered as guards and licensed to carry weapons by the California Department of Consumer Affairs. As the licensor, the State of California has the right to audit the firearms safety program at SSFL at any time; however, the State has never conducted such an audit.

- This concern was not addressed in the ETEC Self-Assessment.

- See Concern QV.1-5.

CONCERNS: (SS.4-1) (H2/C1) **No Operational Assurance (annual audit) program is in place for firearms safety at ETEC, as required by DOE 5480.16, Chapter III, Section 1.b.**

4.5.10 Experimental Activities

4.5.10.1 Overview

The appraisal of experimental activities included interviews of ETEC staff members, primarily in the ETEC Engineering Department, Liquid Metal Programs Operations, and General Program Operations; review of ETEC manuals, procedures, and safety analysis documents; and facility visits. Major facilities visited were the Sodium Component Test Installation (SCTI) and the Thermal Transient Facility, the two ETEC facilities currently active for experiments and tests. The appraisal addressed all four performance objectives in the Experimental Activities category.

The ETEC facilities are not currently used for experiments, as such. They do, however, provide facilities and systems for testing a variety of components. Proposed tests are treated as facility modifications and thus are handled in accordance with the performance objectives in the Technical Support and Site/Facility Safety Review categories. Overall, the system for handling tests was found to be satisfactory. Deficiencies identified were related to safety analysis documents and Operational Safety Requirements (OSRs), and were discussed in the Technical Support section of this report. No concerns specific to experimental activities were identified.

Tests at ETEC facilities are conducted in accordance with written operating procedures that are prepared, reviewed, and approved through a process defined by ETEC policies and procedures. Appropriate operations and technical organizations are involved in this process. The tests are performed by the ETEC operations staff. The test requesters often have representatives present during particularly active phases of the tests, but these representatives perform no hands-on activities. ETEC procedures require that the test requesters be notified of occurrences or changed parameters that might affect test data or component behavior.

As all tests are considered to be facility modifications, they are evaluated to determine if an unreviewed safety question is involved, and safety documentation is produced and processed through the review and approval system, as appropriate. Some deficiencies in safety analysis document content and format, and a lack of operational safety requirements, were identified. (See Concern TS.2-1.)

Test proposals are normally major program items at ETEC. The proposals are written up in the form of "Test Requests" and receive intense technical and administrative scrutiny in the review process. Test requests are submitted with ETEC Form 735-A-6, Rev. 6-88, and are reviewed according to the approvals listed on the cited form. For major projects, the review culminates in a Test Readiness Review. After the request is approved at the designated management level, the test can be initiated. For the SCTI, the entire process is coordinated by the SCTI Program Manager.

Conditions adverse to health and safety are reported through the ETEC occurrence reporting and nonconformance reporting systems. Occurrences are reported in accordance with DOE 5484.1 and DOE 5000.3, as appropriate, and the process includes identification of causes and

4.5.10.2 Findings and Concerns

EA.2 EXPERIMENT CATEGORIES

PERFORMANCE OBJECTIVE: All proposed experiments should be approved by an independent Safety Review Committee before they are performed.

FINDINGS:

- ETEC does not currently have Operational Safety Requirements for use in conducting tests.

CONCERN: See Concern TS.2-1.

4.5.11 Site Facility Safety Review

4.5.11.1 Overview

The appraisal for the Site/Facility Safety Review category of performance objectives comprises the audit of the Independent Safety Review System (ISRS) at ETEC, which is required for compliance with DOE 5482.1B (for non-nuclear facilities). The scope of this appraisal included the first five of the six performance objectives. Performance Objective FR.6, "Operating Experience Review," was covered under the appraisal for Technical Support and is reported in Section 4.5.8. Judgments for this appraisal area were made primarily on the basis of discussions with ETEC and Rocketdyne management personnel and on the basis of review of available documentation related to the existing components of an ETEC ISRS.

No independent ES&H internal appraisal system, as required by DOE 5482.1B, Section 9.d, is clearly defined in the ETEC overview system. There are ad hoc groups formed explicitly to perform Operational Readiness Reviews, and the Rocketdyne Health, Safety, and Environment Department exercises oversight responsibility for ETEC activities. However, the Appraisal Team turned up no documentation which correlates these and related measures with fulfillment of the requirements of DOE 5482.1B, Section 9.d, specifically including independent review of all items stipulated by DOE 5482.1B, Section 9.d.(2)(g).

A recently issued Rocketdyne Health, Safety, and Environment Procedure (B-05, "Health & Safety Audit Program," March 11, 1991) mandates annual safety audits, which would satisfy the requirement specified by DOE 5482.1B, Section 9.d.(2)(e). However, this practice has not yet been implemented.

Direct discussion with the Director of the Rocketdyne Health, Safety, and Environment Department revealed that no triennial evaluations of the ES&H internal appraisal system have been performed at ETEC in the past, and that no requirement for these evaluations has been stipulated by Rocketdyne management. Consequently, the requirement cited in DOE 5482.1B, Section 9.d.(2)(d) that the ES&H internal appraisal system be reviewed by management at least every 3 years is not being met.

4.5.11.2 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 5480.5, or DOE 5480.6, and/or DOE 5482.1B., Section 9.d.

FINDINGS:

- DOE 5482.1B, Section 9.d, mandates an ES&H internal appraisal system with specified characteristics. One requirement is that the appraisal system be independent of persons directly responsible for performance of the activities being appraised; a second requirement is that the system be "clearly defined in writing."

- Discussions with ETEC and Rocketdyne management personnel, including the Director of the Rocketdyne Health, Safety, and Environment Department, indicated that although components of an ES&H internal appraisal system do exist for ETEC, the system is not "clearly defined in writing." Consequently, whether the system conforms to the requirements of DOE 5482.1B cannot be fully determined.

- Examination of several documents related to this subject showed that:

  - Groups formed explicitly to perform Operational Readiness Reviews (ORRs) provide independent appraisal of the safety of new or modified facilities. The ORR groups, however, are appointed with input from DOE and thus are not completely "internal."

  - The Facility Acceptance Testing process specified in ETEC Procedure No. 6-01, Rev. B (September 20, 1984) is not totally independent of persons responsible for facility operations.

  - Rocketdyne Operating Policy M-500, "Rocketdyne Safety Program," March 1, 1991, stipulates Hazards Review, Radiation Control and Health Physics, and Industrial Hygiene Programs, which do not correlate with the requirements of DOE 5482.1B, Section 9.d.

- The question of "independence" of the components of an appraisal system discussed in the documents cited above, including the Rocketdyne Health, Safety, and Environment Department, is not articulated in any of the documents reviewed. (See Concern OA.2-1.)

- This concern was addressed in the ETEC Self-Assessment. (Vol. 1, pp. 2.8-6, 2.8-7.)

CONCERN: **The ES&H independent internal appraisal system is not "clearly defined in writing," as required by DOE 5482.1B, Section 9.d.(2)(b).**
(FR.1-1)
(H3/C1)

FR.4 PERIODIC FACILITY SAFETY REVIEW

PERFORMANCE OBJECTIVE: An annual operating review of the facility should be performed by a committee appointed by top contractor management as specified in DOE 5480.5, DOE 5480.6, or DOE 5482.1B.

FINDINGS:

- DOE 5482.1B, Section 9.d(2)(e) requires the internal appraisal system to "review the overall operation of each facility with sufficient frequency to assure adequate ES&H coverage."
- Discussions with the Director of the Rocketdyne Health, Safety, and Environment Department indicated that comprehensive periodic facility safety reviews have not been performed at ETEC in the past.
- A recently issued Health, Safety, and Environment Procedure (B-05, "Health & Safety Audit Program," March 11, 1991) mandates annual safety audits and specifically references DOE 5482.1B. However, this practice has not been implemented.
- This concern was addressed in the ETEC Self-Assessment. (Vol. 1, p. 2.2.2-8.)
- See Concerns PP.1-2, QV.1-5, and OA.2-1.

CONCERN: **(FR.4-1)** **(H3/C1)** **The practice of periodic ES&H reviews of operations, as required by DOE 5482.1B, Section 9.d.(2)(e), has not been established.**

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, Section 9.d.(2)(d) requires that the internal appraisal system "be reviewed by management for adequacy of performance every 3 years, or more often, as required."
- The Director of the Rocketdyne Health, Safety, and Environment Department reported that no triennial evaluations of the ES&H internal appraisal systems have been performed in the past, and no requirement for these evaluations has been stipulated by Rocketdyne management.
- This concern was addressed in the ETEC Self-Assessment. (Vol. 1, p. 2.8-10)
- See Concerns OA.2-1 and QV.1-5.

CONCERN: (FR.5-1) (H3/C1) **Triennial management reviews of the ES&H internal appraisal system, required by DOE 5482.1B, Section 9.d.(2)(d), are not being performed.**

4.5.12 Radiological Protection

4.5.12.1 Overview

The appraisal of the radiation protection program at ETEC included a review of Radiation Protection and Health Physics Services (RP&HP) and Rocketdyne policies and procedures, discussions with site contractor radiation protection personnel, observation of work in progress, and tours of those facilities where decontamination and decommissioning (D&D) work is occurring. These items were appraised against DOE performance objectives, criteria, Orders, applicable Federal regulations, and prescribed consensus standards. All 12 performance objectives in radiation protection were evaluated as part of this appraisal. In addition, the radiation protection aspects of Packaging and Transportation were also examined. (See also the Environmental Subteam report, Section 3.)

The radiation protection program at ETEC is a fairly small operation compared to other DOE sites, as there are no current research programs involving radiation. The bulk of the work done by personnel supports the D&D operations in Bldgs. T020 and T059. In general, ETEC conducts a radiation protection program that protects the health and safety of its employees, and no situations involving imminent danger were observed. Nonetheless, improvement is required in a number of areas. The training program in radiation protection fundamentals for both radiation workers and others is inadequate, and orientation is not provided to a large number of people on site. (Training is addressed in Section 4.5.5.) Overall, there is a lack of documentation addressing major functional areas of the radiation program, although a large number of procedures are now being drafted or revised. An active ALARA (as low as reasonably achievable) program is not in place, and the Controlled Work Permit (CWP) system is not being effectively used as an ALARA tool. Although air sampling and contamination and area surveys are being performed, there is no trending of radiological data.

Staffing of the program relies on a large number of "flex-force" (retired, part-time employees). Backup candidates have not been identified. The loss of just one of these individuals could severely compromise the program. The continued shortage of full-time key staff and problems with recruiting replacements or new staff are becoming critical to the effectiveness of the program.

Section 2.2.3 of ETEC Self-Assessment was reviewed to determine ETEC and Rocketdyne understanding of the requirements to implement an effective and compliant radiation protection program. Although the deficiencies noted in this Self-Assessment are consistent with the findings and concerns revealed in this appraisal, it is evident that management still does not understand its role and the need to substantially change the method of operating the radiation protection program at ETEC. Most of the findings and concerns reflect a lack of management involvement in day-to-day operations that has resulted in inconsistent implementation of DOE 5480.11 radiation protection requirements.

4.5.12.2 Findings and Concerns

RP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site/facility organization and administration should ensure effective implementation and control of radiological protection activities on the site/facility.

FINDINGS:

- The Manager, Radiation and Health Physics Services, has no previous experience in operational health physics, and has been in the current position for 6 months.

- There is no active program to identify and train backup candidates for key positions. Job descriptions for key positions have not been written. There are no qualified replacements and there has only been limited success in recruitment efforts. This has led to the extensive use of retired, "flex-force" employees. These individuals include the former manager of the section who is also a certified health physicist, and an individual with extensive experience in radiation counting and bioassay. (See also Concern OA.1-1.)

- ETEC uses a controlled work permit (CWP) to establish radiological protection requirements for work activities. No specific direction is given, e.g., as to how the CWP should be completed, who can approve the CWP for health physics, how revisions should be made.

- During a tour of the Radioactive Material Disposal Facility (RMDF) on March 19, 1991, the appraiser received conflicting opinions from the Manager, Radiation Protection and Health Physics Services, and the Manager for Nuclear Operations regarding visitor access control requirements for controlled areas and high-radiation areas. Subsequent review of the controlling procedure (No. N001OSP000002, Radiation Safety Plan for the RMDF) at the request of the appraiser identified that a CWP was required for all entry to RMDF posted radiological areas. As a CWP had not been issued or required at the onset of the guided tour, a violation of the RMDF Radiation Safety Plan had occurred.

- During a tour of the D&D operations in Bldg. T020 on March 20, 1991, there were several inconsistencies between the CWP requirements and actual failure to use operations. These pertained to protective clothing, as prescribed on the controlling CWP, as well as to the number of survey meters available for use (only one, versus a requirement of two in the CWP).

- Radiation workers are required to use radiation survey meters to support their work activities in Bldgs. T020 and T059. Although ETEC radiation safety personnel and interviewed radiation workers indicated that workers receive practical hands-on training in the use of survey meters, this training is not performed according to specific lesson plans and is not documented. (See Concern TC.9-1.)

- During a tour of Bldg. T020 on March 20, 1991, the appraisers noted that the service galley beta-gamma continuous air monitor (CAM) was not operational. The CAM's non-operational status had not been identified by the building radiation protection staff. There is no requirement to conduct daily performance checks on the CAMs.

- These issues were not addressed in the ETEC Self-Assessment.

CONCERN: (RP.1-1) (H2/C1) **There is insufficient oversight by all levels of management and supervision within Radiation Protection and Health Physics Services, resulting in a general lack of radiation safety awareness and acceptance of the established procedures and accepted practices required by DOE 5480.11.**

RP.2 INTERNAL AUDITS AND INVESTIGATIONS

PERFORMANCE OBJECTIVE: The internal audit program for both routine operations and unusual radiological occurrences should provide adequate performance assessments.

FINDINGS:

- An internal audit of the radiation protection program was performed by the Quality Verification Department during the autumn of 1990.
- The lead auditor for the internal appraisal had little experience or training in the field of radiation protection.
- The internal audit was performed using a checklist. No effort was made to ensure compliance and identify problems through field investigations.
- SAN performed two assessments of the ETEC radiation protection program, one in 1989, and one this year.
- This issue was not identified as a concern in the ETEC Self-Assessment.
- See Concern QV.1-5.

CONCERN: (RP.2-1) (H2/C1) **The internal audit program does not provide the level of independent oversight of the radiation protection program required by DOE 5482.1B, Section 9.d, DOE 5480.20, and DOE 5480.11.**

CONCERN: (RP.2-2) (H2/C1) **SAN does not regularly audit ETEC for compliance with DOE 5480.11.**

RP.3 RADIOLOGICAL PROTECTION PROCEDURES AND POSTING

PERFORMANCE OBJECTIVE: Radiation protection procedures for the control and use of radioactive materials and radiation generating devices should provide for safe operations and for clearly identified areas of potential consequences.

FINDINGS:

- A number of significant areas of the radiation protection program are not addressed by procedures. These include
  - Internal dosimetry
  - Contamination control
  - Radioactive source control
  - Placement and use of external dosimetry
  - Access controls and limitations
  - Use of CWPs
  - Release surveys and limits
  - Posting of areas
  - Swipe testing of waste shipments (See Finding RAD/BMPF-1 in the Environmental Subteam report.)
- The radiation dose limits found in Policy G-01, "Radioactive Materials and Ionizing Radiation," March 1991, were found to be partially incorrect. The author explained that apparently his changes were not incorporated during the review process.
- The deficiency in procedures was partially identified in the ETEC Self-Assessment. There is a corrective action plan to draft a number of the procedures currently lacking.
- See Concern QV.1-4.

CONCERN: (RP.3-1) (H2/C1) **The lack of procedures compromises the technical basis and justification for a number of the components of the radiation protection program required by DOE 5480.11.**

RP.4 EXTERNAL RADIATION EXPOSURE CONTROL PROGRAM

PERFORMANCE OBJECTIVE: External radiation exposure controls should minimize personnel radiation exposure.

FINDINGS:

- A nonuniform dose situation in Bldg. T059, where the dose rates are much higher in the knee area than at the torso, was not assessed for proper badging technique.
- Policy G-01 requires a review and approval for individual exposures exceeding 1 rem/yr and operations with cumulative exposures exceeding 500 mrem/yr. No review of the D&D operation in Bldg. T059 was performed, although cumulative exposures were over 500 mrem in 1990. No review/approval was performed for one worker who received 1270 mrem in 1990. ETEC stated that the 1 rem/yr requirement in G-01 was a typographical error; it should have been 1 rem/qtr.
- Dose rate and contamination information is not always found on CWPs.
- Exposure data are not trended. There are no ALARA goals for the reduction of dose. (See Section RP.11 and Concern QV.1-3.)
- ALARA reviews of CWPs, independent of the facility health physicists, are not performed. (See Section RP.11.)
- This concern was not identified in the ETEC Self-Assessment.
- See Concern OA.7-3.

CONCERN: (RP.4-1) (H2/C2) **Current Radiation Protection and Health Physics Services procedures and health physics reviews do not address all external exposure issues required by DOE 5480.11.**

RP.5 EXTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE: The routine and accident personnel radiation dosimetry programs should ensure that personnel radiation exposures are accurately determined and recorded.

FINDINGS:

- The current dosimeter in use is a Landauer film badge, which is not DOE Laboratory Accreditation Program (DOELAP) approved. A letter was forwarded to DOE Headquarters via SAN in December 1989 asking exemption from the DOELAP requirement because of the unavailability of a commercial DOELAP dosimeter. This exemption request is currently undergoing review at Headquarters.
- There is no procedure on the operation of the external dosimetry program incorporating revised DOE 5480.11 requirements at ETEC. (See Concern RP.3-1.) There is no guidance on extremity badging, multibadging in nonuniform fields, or accident investigations.
- The recording of occupational radiation exposure is very manpower intensive. In 1989 and 1990, extremity doses were not added in to exposure records or reported to the Radiation Exposure Information Reporting System (REIRS) database. Personnel interviewed stated that this nonreporting was a clear oversight on their part. It is unclear to what extent the dosimetry data are being archived in accordance with ANSI N13.6. (See Concern QV.1-9.)
- The DOELAP issue was identified in the ETEC Self-Assessment.
- See Concern OA.7-3.

CONCERN: (RP.5-1) (H2/C1) **Current Radiation Protection and Health Physics Services procedures do not fully describe the conduct and operation of the external radiation dosimetry program required by DOE 5480.11.**

FINDINGS:

- Direct Reading Dosimeter results are not always logged as required.
- Direct Reading Dosimeter readings are not always monitored weekly.
- Direct Reading Dosimeter logs do not become a part of radiation protection records.
- This concern was not identified in the ETEC Self-Assessment.

- See Concern OA.7-3.

CONCERN: A policy and a procedure do not exist
(RP.5-2) for the use of Direct Reading Dosimeters for
(H2/C2) radiation exposure monitoring at ETEC.

RP.6 INTERNAL RADIATION EXPOSURE CONTROL PROGRAM

PERFORMANCE OBJECTIVE: Internal radiation exposure controls should minimize internal exposures.

FINDINGS:

- The ETEC internal radiation exposure control program is not documented to meet the requirements of DOE 5480.11 and the DOE Performance Standard for Internal Dosimetry Programs that was issued for trial use.

- A thorough study of the air flow patterns at ETEC facilities requiring air sampling has not been performed.

- Procedures are not detailed enough for the analysis of air samples. ETEC analysis methods do not include corrections for evaluation and correction for alpha self-absorption or potential dust loading on filters. (See Concern TS.5-2.)

- This concern was identified in the ETEC Self-Assessment.

CONCERN: (RP.6-1) (H3/C1) **ETEC has not demonstrated that the air sampling program will meet the requirements of the *DOE Performance Standard for Internal Dosimetry Programs* or DOE 5480.11.**

RP.7 INTERNAL RADIATION DOSIMETRY

PERFORMANCE OBJECTIVE: The internal radiation dosimetry program should ensure that personnel radiation exposures are accurately determined and recorded.

FINDINGS:

- There is no procedure or technical basis for the operation of the internal dosimetry program at ETEC. (See Concern RP.3-1.)
- Urinalysis is used as the bioassay technique for the determination of insoluble Co-60 in Bldg. T059 workers. There has been no technical analysis of the suitability of this technique.
- There are no policies to ensure that bioassay samples fulfill chain-of-custody issues.
- The Radiation Worker training program makes no mention of the internal dosimetry program.
- This concern was identified in the ETEC Self-Assessment.
- See Concern OA.7-3.

CONCERN: (RP.7-1) (H3/C2) **Current Radiation Protection and Health Physics Services procedures do not fully describe the conduct and operation of the internal radiation dosimetry program required by DOE 5480.11.**

RP.10 RADIATION MONITORING/CONTAMINATION CONTROL

PERFORMANCE OBJECTIVE: The radiation monitoring and contamination control program should ensure worker protection from radiation exposures.

FINDINGS:

- No afterwork survey was taken after a drain cleaning operation in room 141 of Bldg. T020 on March 20, 1991. Although this work had a high potential for generating contamination, the technician was not aware of the levels of contamination that might be encountered during the operation.

- During observation of D&D activities (removal of a first floor ceiling) in Bldg. T020 on March 20, 1991, the appraiser requested a radiological survey of the ceiling and the attic area that was exposed during the operation in order to evaluate the adequacy of the radiological controls. The contractor indicated that the roof and attic areas had been last surveyed during 1988. No additional surveys were taken to verify measurements prior to current operations. There are no approved procedures on how to conduct radiation and contamination surveys. (See Concerns RP.3-1 and QV.5-2.) A draft is currently under preparation. Frequency and areas to be surveyed are identified in the facility Radiation Safety Plans.

- The requirement for documenting radiation and contamination surveys was addressed by the ETEC Self-Assessment.

CONCERN: (RP.10-1) (H2/C1) **Current contamination control, posting practices, policies, and radiation monitoring are not consistently conducted or enforced in a manner that ensures positive control of contamination as required by DOE 5480.11.**

RP.11 ALARA PROGRAM

PERFORMANCE OBJECTIVE: A formally structured, auditable program should be in place with established milestones to ensure that exposures are maintained as low as reasonably achievable (ALARA).

FINDINGS:

- Upper-level management policy supporting ALARA is not in place as recommended by the DOE ALARA Manual. There is no active ALARA awareness program.
- Policy G-01 contains a general discussion of an ALARA program, but clear program responsibilities are not defined. In particular, guidance on who will provide formal ALARA reviews and how they will be documented is not identified. The policy states that the figure of $1000/man-rem should be used for cost/benefit analysis.
- No cost/benefit analyses have been performed in support of the ALARA program.
- There are no formal ALARA reviews of CWPs.
- There are no job-specific or annual collective exposure goals.
- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: (RP.11-1) (H2/C1) **The ALARA program does not meet the requirements of DOE 5480.11 and the DOE ALARA Manual.**

4.5.13 Personnel Protection

4.5.13.1 Overview

Occupational Safety and Industrial Hygiene aspects of this S&H Subteam assessment were addressed in this appraisal area. All Personnel Protection performance objectives were assessed. Findings were developed through discussions with Rocketdyne's Health, Safety and Environment (HS&E) Department, Rocketdyne's Environmental Control and Energy Conservation (EC&EC) Department, Rocketdyne's Radiation Protection and Health Physics Services, SSFL Plant Services Department, as well as management and staff members of various ETEC departments and operations. Personnel discussions were conducted in concert with facility walkthroughs. Areas visited included HS&E facilities at Rocketdyne's Canoga site, EC&EC facilities at Rocketdyne's Plummer site, laboratory facilities at Rocketdyne's DeSoto site, and ETEC Bldgs. T020, T029, T032, T036, T038, T065, T100, T133, T355, T356, T357, T358, T360, T361, T392, T462, T463, T487, and others. ETEC facilities visited included representative sites on active, active standby, and inactive standby status. During site visits, policies, procedures, and records were reviewed, and field observations were made to evaluate effectiveness of, and adherence to, the safety and health program. Findings are summarized below.

Line management does not apply a coordinated and organized approach to safety and health program implementation and enforcement. Guidelines have not been established for conduct of self-inspections, safety meetings, or other important systems to administer the program. Rocketdyne Division management provides little guidance on program objectives, goals, and implementing techniques.

Technical support and oversight are to be provided to line management by HS&E. However, only 60 percent of one HS&E safety engineer's time is allocated to ETEC. Industrial hygiene support and oversight are very limited. No HS&E industrial hygienist has ETEC as an assigned responsibility, and support is provided only upon request. Line management must therefore apply its program not only with little divisional and procedural guidance, but also with limited technical support and professional safety and health oversight.

Due to the limited HS&E support and oversight role, many vital safety and health program elements are lacking, including the following:

- Hazards associated with many operations have not been identified, evaluated, monitored, and controlled. Lacking evaluation, hazard awareness and communication are not effectively provided.

- Operating procedures are prepared by line management and specify personal protective equipment and chemical handling techniques. Procedures are prepared without effective guidance from health and safety professionals; this results in failure to implement proper hazard controls.

- Oversight is not conducted for hazardous operations such as asbestos abatement and lead paint removal.

- Programmed audits are not conducted for vital safety aspects.

- Improper monitoring and analytical techniques are applied by operations due to a lack of appropriate review.

Without such support and oversight, a coordinated and effective health and safety program cannot be achieved.

Health and Safety Procedures are provided in a generic Rocketdyne Division manual. This manual contains no site- specific information for ETEC. In many cases, these generic procedures are not in compliance with DOE Orders and OSHA regulations. In addition, procedures are often not enforced. Finally, some necessary procedures are not available, such as those for subcontractor asbestos abatement, chemical hygiene, and carcinogen control.

Decontamination and decommissioning operations are conducted and require the establishment of regulated areas. Exposure controls for radiation hazards are emphasized in these operations; however, chemical and physical hazards are not given proportionate consideration. Activities are often conducted without evaluating the potential for these hazards; therefore, necessary controls are not considered. Regulated areas that are established are not fully contained or controlled, creating potential for contaminant migration to occupied spaces.

To summarize, concerns were identified regarding line management's administration and implementation of the health and safety program, health and safety procedures, compliance with procedures and regulations, identification and evaluation of hazards, management and control of hazardous operations, communication of hazards, and construction safety. Most importantly, however, is the lack of management guidance for program administration, and the failure of HS&E to provide necessary support and oversight for the application of an effective health and safety program.

Finally, it is worthwhile to note that the respiratory protection program stands out in sharp contrast to the many deficient program aspects. It exemplifies the success that a program can achieve when anchored in established procedure and when properly supported by both management and safety and health professionals.

The ETEC Self-Assessment failed to recognize most of the deficiencies in the health and safety program. No concern identified in this appraisal area was fully addressed.

4.5.13.2 Findings and Concerns

PP.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation of the personnel protection program.

FINDINGS:

- Safety and health program responsibilities within the ETEC and Rocketdyne organizations are described in ETEC Procedure No 1-03, "Health, Safety and Fire Protection Program." This procedure is general in nature and does not contain guidelines defining the line management system to implement and enforce health and safety requirements.

- A Rocketdyne Health, Safety and Environment (HS&E) Procedures Manual provides generic procedures for the Rocketdyne Division, but not specifically for ETEC. Each procedure assigns general responsibilities to HS&E, management, and employees. However, the procedures do not provide guidance to the line regarding program implementation and application.

- Lacking procedural guidance, no formal or uniform system is in place for line management to implement, enforce, and ensure safe work practices and safe facility conditions. For instance, line management does not systematically conduct safety meetings, self-inspections, or hazard awareness programs.

- Procedure C-01 of the Rocketdyne HS&E Manual, "Employee Health and Safety Committee," defines a process intended to educate employees in health and safety issues. This Committee meets monthly and comprises representatives of SSFL operations. Three members are ETEC workers who are rotated annually. Thus only a small percentage of the workers participate in this educational process.

- A requirement of the Employee Health and Safety Committee members is to regularly inspect work areas and to identify and report unsafe practices and conditions. However, ETEC members prepare few reports and those which are submitted are superficial in nature. One Committee member reported only one unsafe condition during his year of tenure. Inspection reports are not retained by the Department Head or line manager.

- Committee members are not provided any significant training in the recognition of workplace hazards or in OSHA regulations.

- The three ETEC Committee members assigned do not represent all ETEC work areas/activities.

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concerns OA.7-3, PP.1-2, PP.2-1, PP.2-2, PP.3-1, PP.3-2, PP.3-3, PP.4-1, PP.4-2, PP.5-1 and PP.5-2.

CONCERNS: (PP.1-1) (H2/C2) CAT II

Line management has not developed an effective system to implement and enforce health and safety requirements and to maintain workplaces free of health and safety concerns.

FINDINGS:

- HS&E is a Rocketdyne department with responsibilities for the Division as a whole. The HS&E staff has three industrial hygienists and six safety engineers. Of this staff, only 60 percent of one safety engineer's time is allocated to ETEC operations.

- No HS&E industrial hygienist has ETEC as an assigned responsibility. One industrial hygienist spends a small amount of time supporting ETEC operations, on an as-requested basis. Requests for industrial hygiene support come from the safety engineer partially assigned to ETEC.

- No regular industrial hygiene oversight or review of operations for hazards are performed. The industrial hygienist responding to requests for support has not observed many ETEC operations and has not been in many ETEC facilities.

- The safety engineer partially assigned to ETEC has responsibility for all SSFL activities. He provides safety oversight and support for ETEC operations, but not in a proactive or organized manner.

- "Health and Safety Audit Program," HS&E Procedure B-05, was adopted on March 11, 1991. It defines an HS&E program to schedule and plan audits for each fiscal year. This procedure has not yet been implemented. (See Concern FR.4-1.)

- The following concern was partially addressed in the ETEC Self-Assessment, but a corrective action plan was not prepared.

CONCERN: (PP.1-2) (H2/C2)

The Rocketdyne Health, Safety and Environment Department does not provide the necessary oversight and technical support to ensure line management implementation of safety and health requirements.

PP.2 PROCEDURES AND DOCUMENTATION

PERFORMANCE OBJECTIVE: Procedures and documentation should provide appropriate direction, record generation, and support for the personnel protection program.

FINDINGS:

- Guidelines and procedures have not been established to ensure reliable results for the HS&E industrial hygiene programs. For instance, procedures governing sampling equipment calibration and maintenance, monitoring/analytical techniques, blank/reference sample submittals, and other aspects are not in place. (See Concern OA.7-3.)

- A procedure for the collection and analysis of bulk asbestos samples is not available. The ETEC Chemical/Metallurgical Laboratory analyzes bulk samples using an informal, nonstandardized, and unreliable method; therefore, the asbestos survey database is not valid.

- An operation in Bldg. T059 with potential for worker exposure to diesel emissions is being monitored only for carbon monoxide. However, a more significant hazard associated with diesel emissions is nitrogen dioxide, which is not being monitored or even considered.

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concerns TS.5-2 and TS.2-4.

CONCERN: (PP.2-1) (H1/C2) **Guidelines to ensure the generation of reliable data are not in place for environment, safety, and health monitoring activities; and proper and reliable monitoring procedures are not always being applied.**

FINDINGS:

- The Rocketdyne Division Health, Safety and Environment (HS&E) Procedures are applied to ETEC. These procedures are generic. No site-specific ETEC health and safety procedures are in place.

- These generic HS&E Procedures do not meet requirements of various OSHA regulations, DOE Orders, and good practice standards. Examples are provided below:

  - No site-specific, written hazard communication program is in place, in violation of 29 CFR 1910.1200. (See Section WS.3 and Concern PP.5-1.)

  - No chemical hygiene program has been written for ETEC laboratory operations as required by 29 CFR 1910.1450. (See Section WS.3 and Concern PP.5-1.)

- No detailed procedure governing asbestos abatement by subcontractors is in place. (See Concerns PP.3-2 and WS.3-1.)

- The Confined Space Entry procedure does not meet specifications of Draft 29 CFR 1910.146. For example, rescue procedures are particularly flawed by allowing attendants to enter spaces in case of emergency, and not providing for a specially trained rescue team. In addition, the classification of hazards is in error, and the permit does not contain all specified information.

- No carcinogen program is in place as required by DOE 5480.10.

- No program is in place to comply with 29 CFR 1910.1025, inorganic lead, despite potential for exposures.

• ETEC is not in compliance with key aspects of several HS&E procedures, as well as ETEC procedures, examples of which are listed below.

  - Procedure D-03, "Guarding and Operating Machinery," requirements are not applied. Numerous guarding deficiencies were observed during this assessment. (See Concern WS.4-3.)

  - Procedure D-06, "Energy Control and Power Lockout," requirements are not applied. Tagout is often used instead of the required lockout procedure. (See Section QV.1 and Concern MA.6-3.)

  - Procedure E-03, "Labeling of Hazardous Materials," requirements are not applied. Numerous labeling deficiencies were observed during this assessment. (See Section WS.3 and Concern PP.5-1.)

  - Procedure K-03, "Ropes, Chains, and Slings," requirements regarding inspection, testing, tagging, and storage are not fully applied. Deficiencies were noted during this assessment. (See Concerns MA.3-1 and WS.4-7.)

  - Monitoring, surveillance, and inspection requirements of various procedures are not conducted. (See Concerns PP.1-1, PP.3-1, and PP.4-2.)

  - Personal protective equipment as specified in SCTI operating procedures for morpholine and hydrazine handling are not utilized. (See Concern PP.4-2.)

- The following concern was not addressed in the ETEC Self-Assessment.
- See Concerns QV.1-7, QV.1-8, TS.2-4, and OA.7-3.

CONCERN: (PP.2-2) (H1/C1) **Numerous safety and health procedures, specifications, and guidelines are either not in conformance with Orders and regulations, are not applied and enforced, or are not available, as required by DOE 5483.1A, DOE 5480.10, and various OSHA standards.**

FINDINGS:

- Decontamination and decommissioning (D&D) activities are conducted in areas with radiation hazards. These operations are conducted under a Controlled Work Permit process. This permit, however, is designed for radiation protection and does not provide similar emphasis for industrial hygiene issues, such as potential for lead and asbestos exposure during demolition activities. (See Concerns PP.3-2, PP.4-2, and PP.5-2.)
- Operating procedures are prepared for various work activities by line management (operations). Procedures specify personal protective equipment to be used. However, these procedures are often prepared without input from HS&E industrial hygiene staff and without benefit of professional hazard assessment and monitoring support. (See Concerns PP.4-2 and PP.5-2.)
- Procedures for the movement and cleaning of pumps at Bldgs. T462 and T463 do not provide protection against nitrogen engulfment in case of bag or clamp failure and do not address the potential for benzene exposure from denatured alcohol. Similarly, procedures to transfer and use this alcohol at other facilities do not consider the benzene exposure potential.
- The following concern was not addressed in the ETEC Self-Assessment.

CONCERN: **See Concerns PP.1-2, PP.3-3, PP.4-2, and PP.5-2.**

PP.3 MANAGEMENT OF HEALTH AND SAFETY CONCERNS

PERFORMANCE OBJECTIVE: Chemical, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

FINDINGS:

- Line management does not apply a systematic approach to implementation, application, and enforcement of health and safety requirements. (See Concern PP.1-1.)

- Health, Safety and Environment (HS&E) does not conduct a formalized or planned audit program for verification and oversight of line management and construction management safety and health programs. (See Concern PP.1-2.)

- The construction management program does not effectively consider health and safety issues in the planning and oversight of subcontractor activities. (See Concern PP.4-1.)

- HS&E has not demonstrated a knowledge of hazards associated with ETEC operations. For example, during this assessment the following potential exposures were found, which neither HS&E nor line management had considered:

  - Possibility of benzene exposure while using 20,000 gallons of denatured alcohol to clean components of sodium contamination

  - Possibility of asbestos exposure during a ceiling material removal from Bldg. T020

  - Possibility of lead exposure during paint removal operations in Bldg. T020

  - Possibility of mercury exposure; approximately 1.5 tons of mercury stored in Bldg. T065.

- Industrial hygiene surveys have not been conducted to assess hazards and implement systems to manage health and safety concerns. Industrial hygiene monitoring is not being performed to any significant extent. (See Concern PP.4-2.)

- HS&E does not periodically evaluate hazard controls such as regulated area containments and personal protective equipment usage. (See Concerns PP.3-2 and PP.3-3.)

- The following concern was addressed in the ETEC Self-Assessment, but no corrective action plan was prepared.

- See Concerns OA.2-1 and OA.4-1.

CONCERN: (PP.3-1) (H2/C2) **A coordinated management approach to evaluate and control health and safety hazards, involving both line management and Health, Safety and Environment, has not been established at ETEC.**

FINDINGS:

- A limited asbestos survey was conducted of ETEC facilities. The survey did not address all suspect asbestos-containing materials. An improper method was used for asbestos analyses; therefore, much of the data are not valid.

- Facilities are posted as having asbestos-containing materials; however, the materials are not labeled in most facilities.

- For decontamination and decommissioning (D&D) activities, ETEC personnel abate asbestos materials. Training records show that only two of ten D&D workers assigned to Bldg. T020 have asbestos training, and that training involved only a 2-hour course.

- Industrial hygiene monitoring for ETEC D&D asbestos operations is performed by an HS&E industrial hygienist. These operations are not monitored regularly. No personal exposure monitoring is conducted for abatement actions, in violation of 29 CFR 1926.58. (See Concern WS.3-1.)

- Monitoring records indicate that, at times, asbestos is removed without benefit of containment. For instance, one monitoring report for a floor tile/mastic removal stated "Wind provided good air movement."

- A subcontract is in place with an abatement subcontractor for asbestos removal from non-D&D facilities. Abatement is conducted under a general statement of work, without benefit of abatement specifications and without HS&E oversight.

- The abatement subcontractor can perform its own monitoring or can arrange for monitoring under a subcontract, both of which represent a conflict of interest. Despite the Statement of Work requiring "pre-, ongoing-, and post-abatement monitoring," the abatement subcontractor has been allowed to monitor work at its discretion. Often, no monitoring is conducted during abatement.

- Generally, only one clearance sample is taken per abatement area. The sample is collected by the abatement contractor. Aggressive sampling per EPA guidance is not performed for clearance monitoring. Clearance records do not state that the area was visually inspected and free of visible debris.

- No records or inspection checklists are available to demonstrate compliance with federal and state regulations.

- A Draft Rocketdyne Asbestos Management Program has been written which would address some of the above issues, but it has not yet been finalized or implemented at ETEC.

- Medical monitoring has not been performed for all workers involved in asbestos abatement activities, consistent with the questionnaire and requirements of 29 CFR 1926.58. (See Concern MS.2-1.)

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concerns WS.3-1 and TC.4-2.

CONCERN: (PP.3-2) (H2/C1) **Management of asbestos-containing materials and abatement activities does not demonstrate compliance with 29 CFR 1926.58 and does not ensure that hazard controls are applied.**

FINDINGS:

- Regulated areas intended to contain contaminants and restrict access to contaminated areas are established for confined space entries, D&D activities involving radiation hazards, and asbestos abatement activities. Daily logs are not maintained for entry into regulated areas or for time spent in the areas.

- Containments are not properly constructed for regulated areas, as exemplified below.

  - During a ceiling removal in Bldg. T020, a regulated area was established requiring use of personal protective equipment and respiratory protection. A full containment was not established. By removing the ceiling, the space was opened to adjacent areas where unprotected workers were stationed. Unprotected workers were also allowed to open the door to the area and partially enter.

  - During a D&D activity in Bldg. T059, a four-sided containment was constructed, but it was open overhead. Lack of full containment provided a pathway for escape of contaminants.

  - Asbestos monitoring records indicated that all asbestos abatements are not conducted with benefit of containment. (See Concern PP.3-2.)

- HS&E is not required to review, inspect, approve, or concur with the design of regulated areas or work practice approaches. No regular oversight of regulated areas or associated activities is provided by HS&E.

- Potential for exposure to chemical, physical, and particulate hazards does not receive similar consideration as radiation hazards. The potential for these hazards is not always evaluated. Monitoring for these hazards is not performed to any significant extent. (See Concerns WS.3-1, PP.2-1, and PP.4-2.)

- A confined space entry was conducted at SCTI involving a sodium heater. Neither the entry permit nor a confined space warning sign were posted at the entrance to the space. Not all confined spaces were labeled.

- The following concern was not addressed in the ETEC Self-Assessment.

- See Concerns TC.4-2 and AX.5-1.

CONCERN: (PP.3-3) (H1/C1) **The design and management of regulated areas do not ensure containment and control of hazards and are not consistent with various regulatory requirements and DOE 5480.10.**

PP.4 SURVEILLANCE OF HEALTH AND SAFETY CONCERNS

PERFORMANCE OBJECTIVE: Appropriate surveillance of activities should be conducted to measure safety and health performance and ensure the continued effectiveness of controls.

FINDINGS:

- The construction management program does not apply a system to identify, track, and correct occupational safety and health concerns regarding construction activities, as indicated by the following:

  - Construction coordinators are responsible for enforcing health and safety requirements. Daily activity reports are prepared but do not contain any significant safety oversight component.

  - Construction coordinators do not formally identify, record, track, and close out safety deficiencies.

  - Noncompliance reports regarding safety issues are not prepared.

  - The HS&E Procedure for "Contractor Safety," N-01, does not provide any guidance or approaches for the construction coordinators or HS&E to apply to ensure the implementation, enforcement, and verification of safe work practices.

  - No requirement exists for procurement to be notified of poor safety performance by contractors.

  - Construction coordinators have not been effectively trained in OSHA regulations or recognition of hazards.

  - Subcontractors are required to submit a safety plan. However, implementation and the compliance status of the plan are not reviewed or documented.

- Rocketdyne procurement awards contracts on a low-bid basis, does not consider past safety performance as an evaluation criterion, has not penalized subcontractors for poor safety performance, and keeps no record of safety performance.

- Neither procurement nor construction management formally notifies subcontractors of safety deficiencies and possible ramifications. A November 30, 1990, SAN OSHA Compliance Inspection referred to a subcontractor with "a poor safety reputation." Procurement was unaware of this situation.

- Subcontractors are allowed to enter confined spaces under their own procedures, without review by safety and health professionals.

- Significant construction safety noncompliances were identified during this assessment. (See Section WS.5.)

- The following concern was partially addressed in the ETEC Self-Assessment, but no corrective action plan was prepared.

- See Concern QV.2-1.

CONCERN: (PP.4-1) (H1/C2) **The construction program, including its procurement aspects, does not apply an effective system to implement and enforce safety requirements and correct noncompliances.**

FINDINGS:

- Industrial hygiene surveys have not been performed to identify and evaluate hazards associated with ETEC operations. During this assessment, operations with potential exposure hazards involving benzene, lead, mercury, asbestos, and others were found that have not been considered by HS&E or line management. ETEC is unaware of the degree of hazard.

- Exposure monitoring for operations involving lead, benzene, and asbestos is required by regulation. Such monitoring is not performed. A personal exposure database for these substances is therefore not in place. (See Concern WS.3-1.)

- Exposure monitoring for a variety of chemical hazards had been performed before early 1990; however, monitoring has been virtually discontinued since that time. As a result, vital data have been lacking to support operations. For instance, operating departments have developed procedures specifying respiratory protection without benefit of exposure monitoring data to determine its need or appropriateness. (See Concern PP.3-1.)

- Lacking identification and evaluation, exposure controls and procedural guidelines have not been considered for many hazards.

- Improper or inappropriate methods have been utilized by line management. Examples include bulk asbestos analyses and diesel emissions monitoring. The appropriateness of these techniques was not reviewed by HS&E industrial hygiene professionals. (See Concerns PP.1-2 and PP.2-1.)

- According to HS&E Procedure D-06, "Energy Control and Power Lockout," HS&E is to conduct periodic, random audits to verify procedures are followed. These audits are not conducted.

- Safety surveillance and oversight via line management self-inspections and HS&E inspections are not conducted in a formal, thorough or proactive manner. For instance, inspections for lockout/tagout and for ropes/chains/slings are not conducted, as required. (See Concerns PP.1-1, PP.1-2, PP.3-1, WS.4-7, and MA.3-1.)

- The following concern was partially addressed in the ETEC Self-Assessment, but no corrective action plan was prepared.

CONCERN: **(PP.4-2)** **(H2/C1)**	**A program is not in place to identify, evaluate, monitor, and control credible exposures to chemical, physical, and safety hazards, in violation of various DOE Orders, such as DOE 5480.10 and OSHA regulations, such as 29 CFR 1926.58.**

PP.5 PERSONNEL COMMUNICATION PROGRAMS

PERFORMANCE OBJECTIVE: Site/facility personnel should be adequately informed of chemical, physical, and biological stresses that may be encountered in their work environment. Written programs are available, and are of sufficient quality to comply with all DOE-prescribed occupational safety and health standards.

FINDINGS:

- A site-specific written hazard communication program in compliance with 29 CFR 1910.1200 is not available. The generic Rocketdyne HS&E Procedures E-01 through E-05 addressing hazardous materials, material safety data sheets (MSDSs), labeling, incompatible chemicals, and acids/caustics do not provide all information required of a written hazard communication program, and do not address ETEC or SSFL operations, specifically. (See Section WS.3 and Concern OA.7-3.)

- Hazard communications training is available to employees. However, no system is applied to identify all workers requiring training and to ensure that such workers are trained. Records indicate that some workers requiring training have been overlooked. In addition, internal expiration dates have been exceeded without retraining. (See Section WS.3 and Concerns TC.1-1 and TC.4-2.)

- Hazard identification labels are not present on many chemicals, including those potentially containing carcinogens. An example is the 20,000-gallon tank of denatured alcohol at Bldg. T463. This tank is labeled as "alcohol." No identification of possible benzene, methylisobutyl ketone, or other additives is included. No flammable placard is in place. (See Section WS.3 and Concern PP.5-2.)

- Information, communication, training, chemical hygiene procedures, and other requirements of 29 CFR 1910.1450, "Occupational Exposures to Hazardous Chemicals in Laboratories," are not in place. (See Section WS.3.)

- The following concern was not addressed in the ETEC Self-Assessment.

CONCERN: (PP.5-1) (H2/C1) **A program in compliance with 29 CFR 1910.1200, "Hazard Communication," and information systems required by 29 CFR 1910.1450, "Occupational Exposures to Hazardous Chemicals in Laboratories," are not in place.**

FINDINGS:

- Employees are not always aware and have not been informed of important hazards that necessitate implementation of controls and regulatory requirements. For instance:

- Employees reported benzene to be a component of the 20,000 gallons of denatured alcohol stored outside Bldg. T463. One of these employees wrote an operating procedure for using the material that specified personal protective equipment and chemical-handling procedures. However, the employees were not aware of the hazards associated with benzene and the associated regulatory requirements. Written procedures did not consider the benzene hazard. (See Concerns OA.7-3 and PP.4-2.)

- A supervisor for the Bldg. T020 decontamination and decommissioning (D&D) activities recognized the possibility of lead in paint undergoing removal. After removal, he considered the environmental implication regarding disposal and sent a sample of waste for characterization. However, he was unaware that if lead were involved, requirements of 29 CFR 1910.1025 would apply for the workers involved in the removal.

• Systems such as safety meetings, safety bulletins, and briefings, designed to disseminate information on workplace hazards, are not planned or well organized. Rocketdyne management and HS&E do not provide guidance on program aspects requiring emphasis.

• Hazard warnings are not in place for many confined spaces, high noise areas, and asbestos-containing materials.

• The following concern was not addressed in the ETEC Self-Assessment.

• See Concern TC.4-2.

CONCERN: (PP.5-2) (H2/C1) **Effective mechanisms to inform workers and supervisors of hazards associated with their activities are not applied, resulting in lack of hazard recognition and control, as well as noncompliance with various OSHA standards and DOE 5480.10.**

FINDINGS:

• No comprehensive training plan is available to specify required training by job classification, work area or other category. Managers can independently determine training requirements for employees.

• No control mechanism is in place to ensure that those requiring training receive it.

• Various workers engaged in asbestos abatement and chemical handling have not received associated training.

- No lead or benzene training is provided. Asbestos abatement training consists of only a 2-hour course.
- These issues were not addressed in the ETEC Self-Assessment.
- See Concern PP.5-1.

CONCERN: **See Concerns TC.1-1 and TC.4-2.**

4.5.14 Worker Safety and Health Compliance

4.5.14.1 Overview

A comprehensive safety and health compliance (OSHA-type) appraisal covering general industry and construction standards (29 CFR 1910 and 29 CFR 1926, respectively) was conducted at ETEC to determine compliance with existing OSHA regulations as adopted by DOE. Twenty-nine buildings (active, inactive, standby, and operating standby), and all construction sites, consisting of more than 100,000 square feet, were inspected.

The inspection covered major process, service, laboratory, and maintenance buildings. The appraisal focused primarily on areas selected according to where the majority of employees worked, where hazardous materials were present, type of activity, size of the activity, and size of the building. Facilities satisfying these criteria are the maintenance shops, hazardous materials storage areas, materials storage areas, hazardous waste disposal and decontamination areas, laboratories, and process buildings. These buildings encompass most of the hazardous workplaces. Representative office buildings and other low-hazard areas were also inspected.

Noncompliances and hazards were documented and discussed with management at the end of each day. Repeated noncompliances of the same standard in a department were only noted once on the inspection report form (see Appendix F). All performance objectives for the worker safety technical area were evaluated. A total of 155 noncompliance issues were identified. Of these, 152 were considered serious (98 percent) and three were classified as other than serious (2 percent). The high percentage of serious noncompliance issues may be misleading because the Appraisal Team focused on identifying this type of issue. Table WS-1 provides a summary of the buildings that were inspected, the number of noncompliance issues noted, and the OSHA noncompliance classification of each. Appendix F is a tabulation, by building, of all noncompliances of OSHA standards and the classification of each.

The team noted that the individual deficiencies and noncompliances noted in the inspection reports (Appendix F) were being corrected almost as soon as they were identified. This is commendable; however, a long-term solution necessitates evaluation of the root causes for the noncompliances.

Collectively, the findings indicate deficiencies in the following areas:

- Noncompliances with electrical standards, notably several that pose electrocution hazards, include the following:
  - In Bldg. T355, a 440-volt energized junction box, located beneath the H-2 heater unit, was sitting in approximately two inches of water. The wiring and electrical fixture is not approved for the location.

- In Bldg. T066, a metal storage shelf which was permanently wired with 110-volt power strips was located next to an employee refrigerator. Both the refrigerator and the storage shelf lacked a permanent and continuous electrical path to ground.

- In Bldg. T023, an electrically energized 440-volt control panel board was found missing part of the panel board cover.

- In the Bldg. T463 alcohol storage area and the Bldg. T934 control room, energized electrical circuit breaker panels were noted to have open circuit breaker slots that were not blanked out.

• Required monitoring for carcinogens such as benzene, asbestos, and arsenic is deficient.

• Implementation of the Hazard Communication Program is deficient.

• A Chemical Hygiene Plan has not been developed and implemented.

• Machine guarding is deficient in many areas.

• Personnel protective equipment is not proper or maintained in a clean and reliable condition in many areas.

During this appraisal, no asbestos removal or cleanup was in process to afford confirmation of program adequacy or evaluation of performance in these areas. At the request of this Appraisal Team, Industrial Hygiene Department personnel collected bulk samples of oven gasket material to determine asbestos content. These samples were analyzed and positive findings were obtained for the presence of asbestos.

The noncompliance with OSHA regulations and standards reflects, in part, the lack of an industrial hygienist and safety professional permanently assigned to the ETEC operations.

4.5.14.2 Findings and Concerns

WS.3 COMPLIANCE WITH OCCUPATIONAL HEALTH STANDARDS FOR GENERAL INDUSTRY

PERFORMANCE OBJECTIVE: Site/facility should comply with DOE-prescribed standards for the application of occupational health hazards.

NOTE: Noncompliance with this performance objective will be documented utilizing the OSHA form 1B format and compiled in Appendix E to the Tiger Team Assessment Report.

FINDINGS:

- There is no written hazard communication program specific for each worksite at the ETEC facility.
- Rocketdyne's written generic hazard communication program does not address methods to provide other onsite employer(s) copies or information regarding material safety data sheets for each hazardous chemical the other employer(s)' employees may be exposed to while working.
- Labeling of hazardous chemicals used at ETEC was deficient. For example, labeled containers of acetone in Bldg. T065 did not have appropriate hazard warnings. In addition, containers of chemicals stored in the flammable storage cabinets located in the Cogeneration Plant were not labeled.
- Training of subcontractor employees was nonexistent as it related to Rocketdyne's hazard communication program.
- Training of ETEC employees regarding hazard communication was deficient regarding the details of written programs, physical and health hazards, methods and observations that may be used to detect the presence or release of hazardous chemicals, and measures employees can take to protect themselves.
- A chemical hygiene plan has not been developed or implemented for laboratories at the ETEC facility.
- Employees working in Bldg. T065 required to make up laboratory standards using arsenic trioxide had not been monitored to determine their personal exposure to airborne levels of inorganic arsenic.
- The ETEC Self-Assessment did not identify this area as being deficient.

CONCERN: See Concern PP.5-1.

FINDINGS:

- Employee exposure to chemical hazards has not been fully evaluated. For example, chemicals such as arsenic trioxide, benzene, lead, and asbestos, which require mandatory workplace monitoring of employee exposure have not been addressed.
- Employee exposure to physical hazards such as noise has not been fully evaluated. For example, comprehensive noise surveys of Bldg. T355 and Bldg. T020, Hot cell "D&D" area have not been conducted in order to ascertain the need for a hearing conservation program.
- Bulk stores of ethyl alcohol reported by ETEC staff to be denatured with benzene are located in Bldg. T463. Employees working with or around these storage tanks have not been monitored to determine their airborne exposure to benzene.
- Employees involved in asbestos abatement work in Bldg. T020 were not monitored to determine their airborne exposure to asbestos fibers while removing asbestos-containing floor tile.
- ETEC identified the need for noise monitoring only in Bldg. T355. ETEC did not identify these areas as being deficient in their Self-Assessment.
- See Concerns PP.2-2, PP.3-2, PP.3-3, PP.4-2, and PP.5-1.

CONCERN: (WS.3-1) (H1/C1) **ETEC is not in compliance with the monitoring requirements of 29 CFR 1910.95, Occupational Noise Exposure; 29 CFR 1910.1028, Benzene; 29 CFR 1910.1018, Inorganic Arsenic; 29 CFR 1910.1025, Lead; and 29 CFR 1926.58, Asbestos, Tremolite, Anthophyllite, and Actinolite.**

WS.4 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS FOR GENERAL INDUSTRY

PERFORMANCE OBJECTIVE: Workplace should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

NOTE: Noncompliance with this performance objective will be documented utilizing the OSHA form 1B format. A compilation of these completed forms will be included as Appendix E to the Tiger Team Assessment report.

FINDINGS:

- Emergency lighting is not provided or is inoperable in several locations.
- Passage doors that do not afford a means of egress are not posted "Not an Exit."
- One means of egress in Bldg. T065 has a lock and hasp on the outside of the door, allowing the door to be locked from the outside.
- All exits are not identified and posted as exits.
- ETEC identified this area as being deficient in their Self-Assessment.

CONCERN: (WS.4-1) (H2/C1) **ETEC does not comply with 29 CFR 1910, Subpart E, "Means of Egress."**

FINDINGS:

- The portable eyewash station at Bldg. T029 was not operable.
- The ETEC Self-Assessment did not address this issue.

CONCERN: (WS.4-2) (H1/C1) **ETEC does not comply with 29 CFR 1910.151(C), regarding suitable facilities for quick drenching or flushing of the eyes and body.**

FINDINGS:

- Belts and pulleys are not completely guarded. For example, on the east side of Bldg. T065 the compressor did not have complete guarding of its belt and pulley. The Clausing drill press located within Bldg. T065 did not have complete guarding of its belt and pulley drive system.
- The unused portions of bandsaw blades are not completely guarded.
- Vertical pump shafts and rotating parts of machines such as drill press and lathe chucks are not guarded.

- Anti-restart devices to prevent machine restarts in the event of a power failure were not used in all cases. For example, not all bandsaws and drill presses were equipped with anti-restart mechanisms.

- See Concern WS.2-2.

CONCERN: (WS.4-3) (H1/C1) **ETEC does not comply with 29 CFR 1910, Subpart O, "Machinery and Machine Guarding."**

FINDINGS:

- Several situations were noted that exposed employees to the hazard of electrocution:

  - In Bldg. T355, a 440-volt energized junction box located beneath the H-2 heater unit was noted sitting in approximately two inches of water. The wiring and electrical fixture are not approved for the location.

  - In Bldg. T066, a metal storage shelf that was permanently wired with 110-volt power strips was located next to an employee refrigerator. Both the refrigerator and the storage shelf lacked a permanent and continuous electrical path to ground.

  - In Bldg. T023, an electrically energized 440-volt control panel board was found missing part of the panel board cover.

  - In the Bldg. T463 alcohol storage area and the Bldg. T934 control room, energized electrical circuit breaker panels were noted to have open circuit breaker slots that were not blanked out.

- The ETEC Self-Assessment identified this area as being deficient. However, these specific issues were not identified.

- See Concerns QV.5-1 and MA.2-1.

CONCERN: (WS.4-4) (H1/C1) CAT II **Electrical hazards presented a danger to employees. ETEC does not comply with 29 CFR 1910.304, "Wiring Design and Protection," and 29 CFR 1910.305, "Wiring Methods, Components and Equipment for General Use."**

FINDINGS:

- Flexible cords and cables are used as a substitute for fixed wiring of buildings, e.g., they are run through holes in walls and ceilings, they are run through doorways and similar openings unprotected from damage, and they are concealed behind walls and ceilings.

- Electrical receptacles installed in locations where they could become damp or wet were not suitable for the location. Examples of these conditions can be found in Amazement Park and the entrance to Bldg. T361. In laboratories, ground fault circuit interrupters were not provided near sinks.

- The ETEC Self-Assessment identified this general area as being deficient but did not note these specific findings.

- See Concern WS.4-4.

CONCERN: (WS.4-5) (H1/C1) CAT II — **ETEC does not comply with 29 CFR 1910, Subpart S, "Electrical."**

FINDINGS:

- Load ratings for industrial floors were not posted as required.

- ETEC did not identify this issue in its Self-Assessment.

CONCERN: (WS.4-6) (H2/C1) — **ETEC does not comply with 29 CFR 1910.22(d), "Loading Protection."**

FINDINGS:

- In-house designed lifting devices were not engineered or inspected by a qualified person. For example, a Com-a-long, used to support a pump housing, was attached to a web sling that was cut and snagged. The web sling was held by an overhead crane hook and the hook safety latch was not closed around the sling.

- A nylon web sling, used to lift and support a pump housing, was in contact with the sharp edges of the housing and was not protected from being cut.

- Rigging is not inspected as required. For example, in Bldg. T133, five wire rope slings had been exposed to temperatures in excess of 200°F and had not been removed from service.

- ETEC identified this issue in their Self-Assessment.

- See Concerns PP.2-2, PP.4-2, and MA.3-1.

CONCERN: (WS.4-7) (H2/C1) — **ETEC does not comply with 29 CFR 1910.184, "Slings."**

FINDINGS:

- In Bldg. T023, hosing for an oxygen/hydrogen gas torch was not attached to the compressed gas cylinders and manifold with the proper clamps.

- ETEC did not identify this issue in its Self-Assessment.

CONCERN: (WS.4-8) (H2/C1) **ETEC does not comply with 29 CFR 1910.101, "Compressed Gases (general requirements)."**

FINDINGS:

- Compressed air used for cleaning is not reduced to 30 psi.
- Frayed electrical cords for portable hand tools were observed. For example, a portable hacksaw, used to cut sodium cold traps, had a frayed power cord where the cord entered the casing. A quarter-inch drill, located in Bldg. T065, had a frayed cord at the attachment plug.
- Mushroomed heads on a hammer (deformed surface where pieces of the head could fly off and cause injury) were not dressed to eliminate the hazard of flying chips.
- Chip guards were not used on lathes, drills, or compressed air for cleaning equipment.
- ETEC identified these deficiencies in its Self-Assessment.

CONCERN: (WS.4-9) (H1/C1) **ETEC does not comply with 29 CFR 1910.242, "Hand and Portable Powered Tools and Equipment (general)."**

FINDINGS:

- Secondary spill containment was not provided for bulk storage tanks of sodium hydroxide and sulfuric acid.
- Water was allowed to accumulate under the H-2 heater, where liquid sodium metal spills are possible.
- A Com-a-long was attached to a sling that was deteriorated, and the hook safety latch was not fully closed, thereby allowing the sling to come free and possibly cause a crushing injury to employees.
- ETEC did not identify these deficiencies in its Self-Assessment.

CONCERN: (WS.4-10) (H1/C1) **ETEC does not comply with OSHA Section 5(a)(1), "General Duty Clause."**

WS.5 COMPLIANCE WITH OCCUPATIONAL SAFETY STANDARDS FOR CONSTRUCTION INDUSTRY

PERFORMANCE OBJECTIVE: Workplace should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

NOTE: Noncompliance with this performance objective will be documented utilizing the OSHA form 1B format. A compilation of these completed forms will be included as Appendix E to the Tiger Team Assessment report.

FINDINGS:

- Scaffolding was observed to lack proper guard rails, toeboards, access ladder, and planking meeting Scaffold Grade requirements.
- ETEC did not address this issue in its Self-Assessment.

CONCERN: (WS.5-1) (H1/C1) **ETEC does not ensure that subcontractors control fall hazards to employees during construction activity as required by 29 CFR 1926, Subpart L.**

FINDINGS:

- Several electrical extension cords were observed in need of repair, such as frayed cords, broken faceplates, and cracked plugs.
- A flexible 220-volt extension cord was wired directly into the circuit disconnect that was located outside of Bldg. T361.
- ETEC did not address this issue in its Self-Assessment.

CONCERN: (WS.5-2) (H1/C1) **ETEC does not ensure that subcontractors comply with construction electrical standards, as required by 29 CFR 1926, Subpart K, "Electrical."**

FINDINGS:

- In Bldg. T355, an oxygen/acetylene welding system that had cracked and deteriorating hoses was available for use by employees.
- ETEC did not address this issue in its Self-Assessment.

CONCERN: (WS.5-3) (H2/C1) **ETEC does not ensure that subcontractors comply with 29 CFR 1926.350, "Welding and Cutting."**

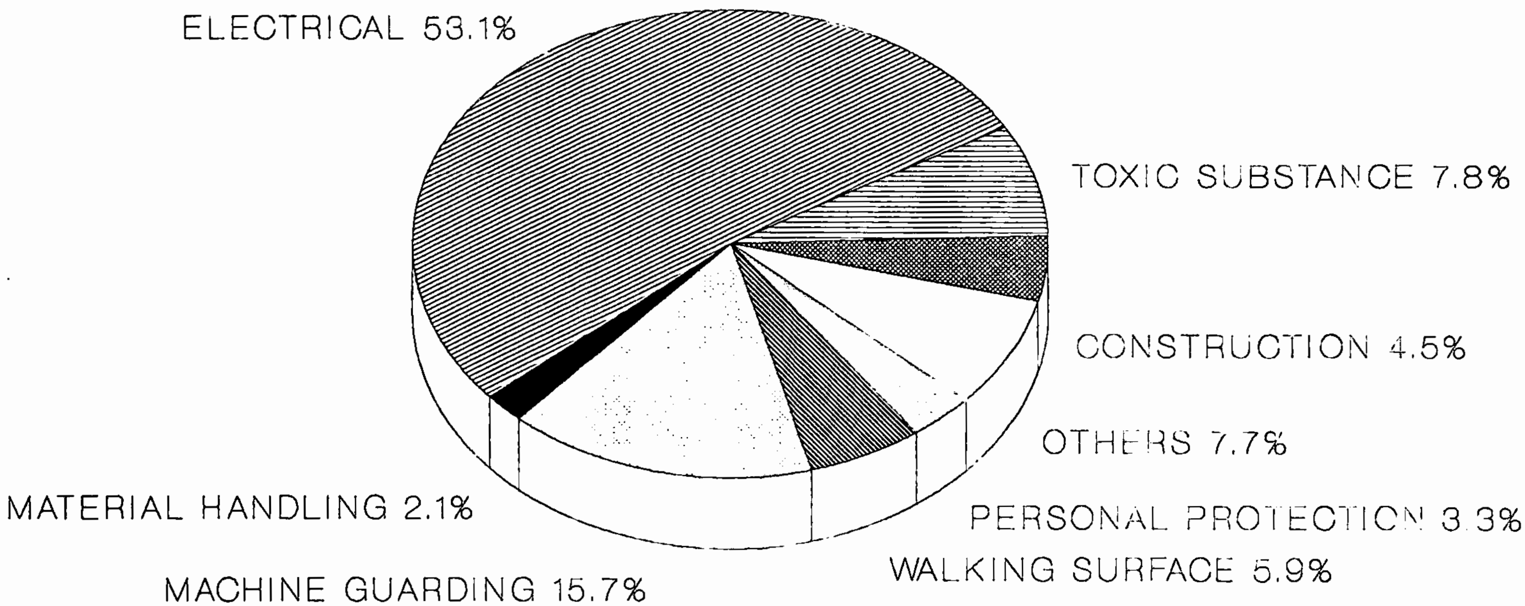
TABLE WS-1
BUILDINGS INSPECTED AND
NONCOMPLIANCE INFORMATION

Location	Number of Noncompliances Serious	Other-than-Serious
Sitewide	1	
Bldg. T013	8	
Bldg. T019	1	
Bldg. T020	1	
Bldg. T021	1	
Bldg. T022	4	
Bldg. T023	11	
Bldg. T025	5	
Bldg. T029	2	
Bldg. T033	2	
Bldg. T044	10	
Bldg. T059	5	
Bldg. T062	7	
Bldg. T065	24	
Bldg. T066	10	
Bldg. T133	5	
Bldg. T355	42	3
Bldg. T361	3	
Bldg. T462	2	
Bldg. T463	5	
Bldg. T484	1	
Bldg. T665	1	
Bldg. T934	1	
TOTAL	152	3
Percentage	98	2

Total Noncompliances 155

NOTE: Construction violations are cited under Bldg. T355. There were a total of seven construction violations, all of which were considered serious violations under 29 CFR 1926.

ETEC WORKER SAFETY VIOLATIONS
OSHA 29 CFR 1910 & 1926 STANDARDS



OTHERS: LESS THAN 2.0% VIOLATIONS

4.5.15 Fire Protection

4.5.15.1 Overview

All seven performance objectives in the Fire Protection functional area were addressed during this appraisal. The Appraisal Team also addressed the site contractor's compliance with requirements and guidelines contained in DOE 5480.1B, DOE 5480.4, DOE 5480.7, DOE 6430.1A, the National Fire Protection Association (NFPA) mandated National Fire Codes, and the philosophy and standards of the highly protected risk insurance industry.

The appraisal encompassed both active and inactive facilities and programs managed and operated by Rocketdyne for ETEC. The appraisal was based on interviews with management and staff personnel in Protective Services. The Fire Protection Engineering Section and the Fire Department Section (along with Government Security, Investigations, Applicant Review, and Emergency Planning) are functions of the Industrial Security Department. These Departments are within the Human Resources Department. A review was made of the Fire Department, including its performance during an emergency drill. Site tours and inspections included Bldgs. T013, T023, T036, T044, T688, T665, T022, T021, T621, T075, T034, T014, T133, T041, T029, T462, T463, T057, and T032, and special attention was given to reviewing compliance with the NFPA 101 Life Safety Code.

The Rocketdyne Protective Services group is responsible for fire protection at ETEC. The Fire Protection Engineering Section is responsible for Life Safety Code compliance. The responsibilities and authorities for Rocketdyne Fire Protection Engineering activities and the Protective Services Fire Department are stated in the Industrial Security's Fire Protection Program.

At the time of this appraisal, Rocketdyne had not established a formal program to ensure compliance with NFPA 101, Life Safety Code. However, an internal program addresses these requirements. Through Protective Services inspections, identified deficiencies are referred to the building management for further action. The Fire Protection Engineering Section also conducts SARs and Fire Protection Evaluation Inspections on active and inactive buildings. Through the combined efforts of these two inspection programs, some of the NFPA 101 objectives are being met. A tracking system is in place that allows for follow-ups or trending analysis on life safety and fire protection surveys.

Fire Protection Engineering performs various tasks according to ROP H-510 (e.g., review and approval of all Facilities Engineering designs, as well as those developed by outside architect and engineering firms for new facilities and modification to existing facilities). They also are responsible for Emergency Planning, which covers 12 items. In the Appraisal Team's opinion, the number of personnel assigned to the fire protection engineering section is not sufficient to ensure timely response to the higher standards expected under DOE's new fire and safety requirements.

The most serious concern is the lack of adequate Fire Department personnel to safely fight fires in nonsprinklered buildings or unsprinklered sections of buildings. Rocketdyne participates in a written mutual aid arrangement with the Ventura County Fire Department, and has unwritten agreements with Los Angeles County and Los Angeles City Fire Departments. However, this assistance is a minimum of 20 minutes away from the ETEC site. In addition, the Fire Department is not augmented by a trained fire brigade or volunteer fire personnel. Although the condition and maintenance of the Department's fire apparatus and equipment are excellent, the Department has minimum staffing. While the day shift may have enough personnel to provide adequate site fire protection (i.e., one fire pump operator; four area inspectors, who are cross-trained in firefighting and security; two gate guards; one training captain; one sergeant; and two lieutenants), the other two shifts operate with fewer personnel, seriously reducing initial response efficiency. This manning does not meet the NFPA 1500 code requirements for a minimum acceptable fire company staffing, which is four members arriving with each engine or ladder company responding to any type of fire (NFPA 1500, A-6-2-1).

Rocketdyne does not require fire fighters to be certified under the State of California or NFPA Certification programs. In fact, there is no certification process for the entire Rocketdyne Fire Department organization. The Fire Department does not have a physical fitness program or a rehabilitation program for personnel unable to meet the standard fitness program according to NFPA 1500 requirements.

Another serious concern is the reliability of the firefighting water delivery system. Many components of this system are vulnerable to vehicular accidents, seismic events, and maintenance problems. Any of these occurrences could seriously disrupt the water supply needed to fight fires. There are exposed natural gas mains running parallel to the water distribution system; damage to these mains could pose a serious hazard. Service and maintenance to the water mains are not being performed as required by NFPA 24.

Rocketdyne has a program in place to protect vital and important records from fire. The storage vault is protected by automatic sprinklers, and an ionization detection system with a self-closing fire damper completes the fire barrier protection. There is no storage of duplicate records in a separate location.

Conditions exist at the Sodium Component Test Installation that do not meet NFPA 101. These deficiencies have been identified by DOE and Rocketdyne and include the following:

- Replacing doors along the east and north walls with fire doors rated for a Class "C" opening; these doors must close automatically and must not be blocked open

- Extending the existing sprinkler system in Bldg. T355 to cover the control and computer rooms

- Sealing all openings, including cable penetrations in the common wall between the control room and the locker room with an approved U.L.-listed sealant.

The above items are to be completed before this unit becomes operational.

Other concerns include the inactive buildings at ETEC presently warehousing various types of equipment and, in some cases, control and computer rooms. These areas should receive the same scrutiny as active buildings.

4.5.15.2 **Findings and Concerns**

FP.2 **LIFE PROTECTION**

PERFORMANCE OBJECTIVE: All facilities on site should provide adequate life safety provisions against the effects of fire.

FINDINGS:

- There is no written program in place to ensure that facilities comply with NFPA 101.
- Inadequate fire wall separation was noted in the Bldg. T013 and the Sodium Component Test Installation (SCTI) control and computer room.
- Emergency lighting, illumination of exit lights, and exit signs are inadequate in some buildings. (See Concern WS.4-1.)
- Panic hardware opening devices have not been installed in some buildings.
- The ETEC Self-Assessment recognized that ETEC is not in full compliance with NFPA 101.

CONCERN: **Not all ETEC facilities are in compliance with**
(FP.2-1) **NFPA 101 relating to illumination of exit**
(H2/C1) **signs and emergency lighting.**

FP.6 FIRE DEPARTMENT OPERATIONS

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:

- NFPA 1500, Standard on Fire Department Occupational Safety and Health Program, a DOE mandatory standard, requires the development and implementation of a physical fitness program. On September 19, 1988, DOE Headquarters issued a memo regarding the implementation of NFPA 1500. No guidance was contained for Section 8 of NFPA 1500, which covers the physical fitness program. The memo indicated that "the Director of DOE medical programs" was expected to issue guidance at some future date, but such guidance has not yet been provided. Section 8 of the revised NFPA 1500 Implementation Plan, which was attached to the memo of September 29, 1988, required "each department to develop a physical fitness maintenance program."
- Under emergency firefighting conditions, fire fighters may be subjected to significant mental and physical demands associated with wearing firefighting clothing and breathing apparatus, pulling and positioning fire hose lines, and enduring high temperatures and toxic and smoke-filled environments.
- SAN has not provided guidance and direction to Rocketdyne for the development and implementation of a physical fitness program for fire fighters as required by NFPA 1500.
- This issue was identified in the ETEC Self-Assessment.
- See Concern OA.5-2.

CONCERN: (FP.6-1) (H1/C1) **Rocketdyne has not implemented a physical fitness program for fire fighters as required by NFPA 1500.**

CONCERN: (FP.6-2) (H1/C1) **SAN has not provided evidence and direction to Rocketdyne for the implementation of a physical fitness program for fire fighters as required by NFPA 1500.**

FINDINGS:

- On the day and evening shifts, only one Fire Department pump operator is available, plus four area inspectors who are on patrol and are cross-trained in fire protection and security for firefighting purposes.

- On the midnight to morning shift there is no fire pumper operator available. There are four area inspectors who are on patrol that are cross-trained in fire and security (who have to return to the fire station to man the fire pumper), one lieutenant or sergeant, and one gate guard.

- Mutual aid firefighting assistance for the ETEC site is available from Ventura County Fire Department, Los Angeles County Fire Department, and Los Angeles City Fire Department. However, the closest mutual aid firefighting assistance is at least 20 minutes from the ETEC facilities. (See Concern OA.4-1.)

- The Rocketdyne Fire Department at SSFL is not augmented by an onsite trained fire brigade or volunteer fire personnel.

- The staffing or manning requirements for a minimally acceptable fire company of four members responding on, or arriving with, each engine or ladder company to any type of fire according to NFPA 1500, A-6-2-1 are not being met.

- The ETEC Self-Assessment recognized that they are not in full compliance with NFPA 1500.

- See Concern TC.1-1.

CONCERN: (FP.6-3) (H1/C1) **The staffing level of the Rocketdyne Fire Department is not commensurate with the fire risk, and does not comply with NFPA 1500.**

FINDINGS:

- There is no training program developed for fire officer level or for firefighter levels II or III advancement.

- There is no safety officer trained or assigned to the Fire Department.

- There is no standard in place to measure the proficiency of Fire Department personnel.

- The fact that ETEC is not in full compliance with NFPA 1500 was addressed in the ETEC Self-Assessment.

- See Concern TC.1-1.

CONCERN: (FP.6-4) (H2/C2) **The Rocketdyne Fire Department does not have a training program in place for advancement of firefighter personnel, or a standard for measuring the proficiency of Fire Department personnel.**

CONCERN:	**The Rocketdyne Fire Department does not have an**
(FP.6-5)	**assigned safety officer as required by**
(H2/C2)	**NFPA 1500.**

4.5.16 Medical Services

4.5.16.1 Overview

Medical services for ETEC are provided through and managed by Rocketdyne Division. The medical facilities and equipment at SSFL, Canoga, and DeSoto were evaluated. The ETEC area was toured with a drive-through and briefing. Production areas at Canoga and DeSoto and the recreation facility and activities were observed during a walkthrough with the Medical Director. Patient records (charts) were reviewed, as were Medical Department policy, practice, procedures documents, logs, and reports. Procedures were observed. Interviews were conducted with the Medical Director, the General Manager of ETEC, nurses, the Employee Assistance Program (EAP) counselor, a physicians assistant, an emergency medical technician, a rehabilitation counselor, the Director of the Health and Safety Department, a union representative, a staff member at the recreation center, and patients and other employees encountered at random. The contractor medical program was addressed in the ETEC Self-Assessment, although the Medical Director did not directly participate in, or directly contribute to, the document. Two of the concerns resulting from this appraisal were identified in the ETEC Self-Assessment but were dismissed without plans for correction. The appraisal was conducted using all five performance objectives for medical services.

An appraisal of the medical program was conducted at the request of the Medical Director, DOE in March 1989. At that time, recommendations were made to upgrade the medical facilities at ETEC and Canoga and to augment the staff. Currently, three medical facilities are staffed by 10 full-time, three part-time, and one temporary employee. Full time employees include one physician's assistant, four registered nurses, a licensed vocational nurse, an x-ray technician, an administrator, and a secretary. Part time are two rehabilitation counselors and a physical therapist. Although the staffing levels are significantly below DOE 5480.8 guidelines, the Self-Assessment considers this to be a "management prerogative." Plans to enlarge the Canoga medical facility have been discussed, and the current date to begin construction and revision is stated to be November 1991.

The Medical Services Department conducts activities and programs that are broad in scope, contain all the elements of a contemporary occupational medical program, and are with few exceptions of the highest quality. Much excellent documentation exists. However, there is no routine review of documentation, practices, procedures, and medical records to ensure that performance meets the desired and established standards. The Medical Director is qualified and experienced; he is certified by the American Board of Family Practice and as a Fellow of the American College of Occupational Medicine.
There is an excellent EAP conducted by a Certified Employee Assistance Professional. Programs in fitness, health education, and wellness are conducted in the recreation center by a large, well-qualified staff in close consultation with the Medical Director. A substance abuse program

provides for drug testing. Treatment of work injuries and of personal illness and emergencies to the extent usually provided by industry is of high quality. Effective programs of rehabilitation and case management are in place. The SARP (Substance Abuse Recovery Program) is well run, with representatives from management, union, EAP, and Medical.

A medical surveillance program is well documented and employees potentially exposed to hazards are identified. Extensive comprehensive laboratory tests, audiometry, pulmonary function, x-ray and EKG, and review of medical and work history are routinely performed. Appropriate forms and reports are well organized and maintained in the medical record. Records are current and results of tests are promptly communicated to employees. Examination by a physician or physicians assistant is seldom done, however. Medical surveillance for asbestos does not include the required history form. Not every visit to the medical facilities is recorded in the medical record. Routine periodic examinations are offered only to executives.

4.5.16.2 Findings and Concerns

MS.1 ORGANIZATION AND ADMINISTRATION

PERFORMANCE OBJECTIVE: Site and facility organization and administration should ensure effective implementation and control of the medical services program.

FINDINGS:

- The Medical Director reports to the Vice President, Human Resources.
- The Medical Director does not participate in accident investigations.
- The Medical Director did not directly participate in the ETEC Self-Assessment.
- The Medical Director does not participate in formulating/reviewing all health- and safety-related policies and procedures.
- There are few formal meetings/contacts between the Medical Director and other health and safety professionals.
- The Medical Department does not have training, support, or equipment for use of computers.
- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: (MS.1-1) (H3/C1) **The Medical Director is not appropriately involved or supported to be fully informed and able to provide timely input to top management, 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:

- Not all visits to the Medical Department are recorded in the patient medical record (chart).
- The history form for asbestos exposure required by OSHA is not used.
- The medical records are current and well organized, and data is arranged for prompt retrieval and comparison.
- This concern was not addressed in the ETEC Self-Assessment.
- See Concerns MS.3-2 and PP.3-2.

CONCERN: **Medical records are not complete as required by DOE 5480.8 and do not meet OSHA standards.**
(MS.2-1)
(H2/C1)

MS.3 **MEDICAL TREATMENT**

PERFORMANCE OBJECTIVE: Medical treatment should be available and provided by qualified, competent staff, and adequate facilities should be available.

FINDINGS:

- The Canoga facility can only be accessed by a circuitous route. The facility lacks privacy, and many rooms serve multiple purposes. There is no reception waiting area, no conference or library area, and no separate office for each nurse. Patient flow is not smooth and becomes bottlenecked with patients waiting for available rooms for procedures or treatment.
- The medical facility at SSFL lacks a professional, dignified appearance.
- This concern was not addressed in the ETEC Self-Assessment, but the need to enhance facilities is recognized and implementation is scheduled to begin November 1991.

CONCERN: (MS.3-1) (H3/C1) **The medical facilities are not sufficiently spacious and do not provide for privacy as required by DOE 5480.8 or community standards.**

FINDINGS:

- Ten full-time, three part-time, and one temporary employee staff four facilities that serve 9,000 employees.
- Many examinations do not include physical examination by a physician or physicians assistant. (See Concern MS.3-3.)
- Routine tours of the plant facilities are not conducted.
- Regular staff meetings are not conducted.
- Training and continuing medical education opportunities are limited by staffing requirements.
- This concern was addressed in the ETEC Self-Assessment and no action is planned.
- See Concern MS.2-1.

CONCERN: (MS.3-2) (H2/C1) **Staffing is inadequate to meet routine and emergency requirements and does not meet industry or DOE 5480.8 standards.**

FINDINGS:

- Voluntary routine periodic examinations are not offered to all employees.
- Medical surveillance examinations are not done annually.
- Surveillance examinations often do not include physical examination by a physician or physicians assistant.
- Preplacement examinations are often done without physical examinations.
- This concern was addressed in the ETEC Self-Assessment but no action plans were stated.
- See Concerns MS.2-1, OA.8-1, and OA.8-2.

CONCERN: (MS.3-3) (H2/C1) **The physical examination program does not meet requirements of Rocketdyne policies and procedures or OSHA or DOE 5480.8 standards.**

MS.4 **REVIEW AND AUDIT**

PERFORMANCE OBJECTIVE: Policies, procedures and practices for medical services should be reviewed and audited periodically to ensure continued effectiveness of medical services.

FINDINGS:

- Medical services has no program of routine audit of performance review of records.
- Copies of relevant policies, practice, and procedure documents and OSHA and DOE standards are not readily available for reference and familiarity, and are not effectively communicated.
- Policies, practices, and procedures are not reviewed on a regular basis.
- This concern was not addressed in the ETEC Self-Assessment.

CONCERN: **(MS.4-1)** (H2/C1) **Compliance with company and regulatory standards cannot be ensured without a review and audit program.**

4.6 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.

4.7 CATEGORIZATION AND TABULATION OF CONCERNS

4.7.1 Categorization of Concerns

Concerns Numbers	Potential Hazard Level	Compliance Level
OA.1-1	2	2
OA.1-2	2	2
OA.1-3	2	2
OA.2-1	2	2
OA.3-1	2	2
OA.4-1	2	2
OA.5-1	2	2
OA.5-2	2	1
OA.6-1	2	2
OA.7-1	2	2
OA.7-2	3	2
OA.7-3	2	2
OA.8-1	3	2
QA.8-2	3	2
QV.1-1	3	1
QV.1-2	2	2
QV.1-3	2	2
QV.1-4	2	1
QV.1-5	3	2
QV.1-6	2	2
QV.1-7	1	2
QV.1-8	1	1
QV.1-9	3	1
QV.1-10	2	2
QV.2-1	2	1
QV.3-1	2	1
QV.4-1	2	1
QV.5-1	1	1
QV.5-2	3	1
QV.5-3	2	1
QV.5-4	2	1
QV.6-1	2	2
QV.6-2	2	1
QV.7-1	3	1
QV.7-2	2	1
OP.1-1	3	2
OP.3-1	2	2
OP.4-1	2	2
OP.5-1	2	2
OP.6-1	2	2
MA.1-1	2	1
MA.1-2	2	2

Concerns Numbers	Potential Hazard Level	Compliance Level
MA.1-3	2	2
MA.1-4	2	2
MA.2-1	2	2
MA.3-1	1	2
MA.4-1	2	1
MA.4-2	3	2
MA.5-1	1	2
MA.5-2	2	2
MA.6-1	2	2
MA.6-2	2	2
MA.6-3	1	1
MA.7-1	3	2
MA.8-1	3	1
TC.1-1	2	1
TC.3-1	2	1
TC.4-1	2	1
TC.4-2	2	1
TC.5-1	3	1
TC.7-1	3	2
TC.8-1	3	1
TC.9-1	2	1
TC.10-1	2	1
AX.1-1	2	2
AX.5-1	2	2
EP.1-1	2	1
EP.1-2	2	1
EP.2-1	2	1
EP.2-2	2	1
EP.3-1	2	1
EP.4-1	2	1
EP.5-1	2	1
EP.6-1	2	1
EP.7-1	2	1
TS.2-1	2	2
TS.2-2	2	1
TS.2-3	2	1
TS.2-4	2	2
TS.3-1	2	2
TS.3-2	3	1
TS.3-3	3	1
TS.4-1	2	2
TS.5-1	2	2
TS.5-2	2	2

Concerns Numbers	Potential Hazard Level	Compliance Level
SS.2-1	1	2
SS.4-1	2	1
FR.1-1	3	1
FR.4-1	3	1
FR.5-1	3	1
RP.1-1	2	1
RP.2-1	2	1
RP.2-2	2	1
RP.3-1	2	1
RP.4-1	2	2
RP.5-1	2	1
RP.5-2	2	2
RP.6-1	3	1
RP.7-1	3	2
RP.10-1	2	1
RP.11-1	2	1
PP.1-1*	1	1
PP.1-2	2	2
PP.2-1	1	2
PP.2-2	1	1
PP.3-1	2	2
PP.3-2	2	1
PP.3-3	1	1
PP.4-1	1	2
PP.4-2	2	1
PP.5-1	2	1
PP.5-2	2	1
WS.3-1	1	1
WS.4-1	2	1
WS.4-2	1	1
WS.4-3	1	1
WS.4-4*	1	1
WS.4-5*	1	1
WS.4-6	2	1
WS.4-7	2	1
WS.4-8	2	1
WS.4-9	1	1
WS.4-10	1	1
WS.5-1	1	1
WS.5-2	1	1
WS.5-3	2	1

*Designates a Category II Concern

Concerns Numbers	Potential Hazard Level	Compliance Level
FP.2-1	2	1
FP.6-1	1	1
FP.6-2	1	1
FP.6-3	1	1
FP.6-4	2	2
FP.6-5	2	2
MS.1-1	3	1
MS.2-1	2	1
MS.3-1	3	1
MS.3-2	2	1
MS.3-3	2	1
MS.4-1	2	1

4.7.2 Tabulation of Concerns

4.5.1 Organization and Administration

CONCERN: (OA.1-1) (H2/C2) Safety responsibilities specific to each job or position, and the commensurate authority to accomplish these responsibilities, are not always clearly defined.

CONCERN: (OA.1-2) (H2/C2) Regularly scheduled safety meetings are not always held for all staff personnel, and safety information is not always shared as a means of promoting safe operations.

CONCERN: (OA.1-3) (H2/C2) ETEC management has not been proactive in ensuring compliance with DOE safety and health requirements.

CONCERN: (OA.2-1) (H2/C2) The distinction between the line safety assurance program and the independent safety overview program has not been defined, nor have staff been assigned to accomplish each program so as not to present a conflict or potential conflict of interest.

CONCERN: (OA.3-1) (H2/C2) Written safety goals are not established or widely promulgated within ETEC.

CONCERN: (OA.4-1) (H2/C2) The interfaces and assignments of responsibility for ensuring support, assistance, and independent safety oversight of those activities provided by Rocketdyne to ETEC are not well defined.

CONCERN: (OA.5-1) (H2/C2) Performance indicators have not been used as a means of promoting and encouraging safety in the workplace.

CONCERN: (QA.5-2) (H2/C1) SAN has not provided the necessary oversight of ETEC activities to ensure safe operations and compliance with DOE requirements.

CONCERN: (OA.6-1) (H2/C2) Annual performance evaluations are not regularly performed, and safety has not been a consistent element in past evaluations.

CONCERN: (OA.7-1) (H2/C2) "Controlled Documents" are not consistently controlled, and there is no independent assurance that controlled documents are maintained current.

CONCERN: (OA.7-2) (H3/C2) There is no requirement for periodic review and update of ETEC Procedures and, contrary to ETEC requirements, substantive pen-and-ink changes have been made to ETEC Procedures.

CONCERN: (OA.7-3) (H2/C2) Management is not ensuring that procedures are being followed, that procedures address all areas necessary to ensure safe operation, and that procedures are always available when needed.

CONCERN: (OA.8-1) (H3/C2) Not all management and staff have received training on substance abuse and the Employee Assistance Program, and retraining for management has not been scheduled.

CONCERN: (OA.8-2) (H3/C2) The criteria for medical surveillance and annual drug screening tests are not entirely consistent.

4.5.2 Quality Verification

CONCERN: (QV.1-1) (H3/C1) ETEC has not developed an integrated QA plan that meets DOE 5700.6B and SAN MD 5481.1A, including measurable quality objectives and actions required to implement stated quality assurance policy.

CONCERN: (QV.1-2) (H2/C2) Stop-work authority is a fundamental aspect of an effective inspection program, yet ETEC inspection personnel cannot stop work.

CONCERN: (QV.1-3) (H2/C2) Ongoing activities are not evaluated to identify short- or long-term trends that are adverse to quality.

CONCERN: (QV.1-4) (H2/C1) The lack of specific procedural requirements and verification has resulted in activities that do not meet the requirements of DOE 5480.19 and 5480.11.

CONCERN: (QV.1-5) (H3/C2) Quality audits at ETEC do not evaluate the effectiveness of program implementation as required by DOE 5700.6B, Paragraph 7a. Some audits are conducted by personnel that do not meet the technical or administrative qualifications of ANSI/ASME NQA-1.

CONCERN: (QV.1-6) (H2/C2) Actions to correct identified deficiencies do not determine and correct their causes. Some identified deficiencies are allowed to continue uncorrected.

CONCERN: (QV.1-7) (H1/C2) Procedures in use at ETEC do not provide a level of detail needed to direct personnel in the correct completion of work and are not always technically correct.

CONCERN: (QV.1-8) (H1/C1) ETEC management does not require vigilant conformance to procedures, resulting in widespread procedural noncompliance to ETEC Procedures and DOE 5700.6B, including work practices that place ETEC personnel in danger.

CONCERN: (QV.1-9) (H3/C1) Important records are not stored and maintained, and protected from damage as required by ANSI/ASME NQA-1, DOE 5480.11, and DOE 1324.2A.

CONCERN: (QV.1-10) (H2/C2) Current QV resource allotment cannot support a quality verification program that meets the requirements of ANSI/ASME NQA-1 and DOE 5700.6B.

CONCERN: (QV.2-1) (H2/C1) Items and services are procured from unapproved sources without specified quality requirements, as required by ETEC Procedures and ANSI/ASME NQA-1. Where quality requirements had been invoked, they have not been consistently enforced.

CONCERN: (QV.3-1) (H2/C1) Most receipt inspections do not verify critical attributes of items as required by ANSI/ASME NQA-1.

CONCERN: (QV.4-1) (H2/C1) Many measuring and test items not calibrated in Bldgs. T066 or T011 are either used in an uncalibrated status or are standardized without procedures or traceable standards, contrary to ANSI/ASME NQA-1.

CONCERN: (QV.5-1) (H1/C1) ETEC equipment and material are not controlled as required by DOE 5700.6B and ANSI/ASME NQA-1, including early detection and correction of deficiencies.

CONCERN: (QV.5-2) (H3/C1) ETEC personnel do not understand their responsibilities to evaluate and report deficiencies as required by ETEC Procedure 2-20, DOE 5000.3A, and DOE 5700.6B.

CONCERN: (QV.5-3) (H2/C1) Items and material at ETEC are not identified, stored and handled to ensure that only proper items are used as required by ETEC Procedure 4.01, "Storage and Control of Materials," and ANSI/ASME NQA-1.

CONCERN: (QV.5-4) (H2/C1) Items, components, and material at ETEC are not handled and preserved to prevent degradation as required by ETEC Procedures and ANSI/ASME NQA-1.

CONCERN: (QV.6-1) (H2/C2) Only a minimal inspection program is currently implemented at ETEC.

CONCERN: (QV.6-2) (H2/C1) Inspections are performed without the use of inspection procedures by uncertified inspection personnel. This does not meet the requirements of DOE 5700.6B and ANSI/ASME NQA-1.

CONCERN: (QV.7-1) (H3/C1) Special processes at ETEC are performed by personnel not certified in accordance with ANSI/ASME NQA-1.

CONCERN: (QV.7-2) (H2/C1) Special process materials at ETEC are not controlled as required by ANSI/ASME NQA-1 and AWS D1.1, "Structural Welding Code."

4.5.3 Operations

CONCERN: (OP.1-1) (H3/C2) No formally articulated safety awareness programs exist in the operations departments.

CONCERN: See Concern TS.2-1.

CONCERN: (OP.3-1) (H2/C2) The practices for revising operating procedures by piecemeal red-lining do not allow for complete review of changes before implementation.

CONCERN: (OP.4-1) (H2/C2) The implementation of the new Program Operations Department Directives (PODD-5 and PODD-6) on the ETEC lock-and-tag programs does not ensure accurate documentation of the process.

CONCERN: (OP.5-1) (H2/C2) Interfaces between ETEC operations personnel and Rocketdyne Plant Services have not established sufficient operations control for maintaining operations stations.

CONCERN: (OP.6-1) (H2/C2) Shift Leaders and operators have not received training on the use of Operational Safety Requirements as the primary administrative control documents.

4.5.4 Maintenance

CONCERN: (MA.1-1) (H2/C1) ETEC is not in full compliance with DOE 4330.4, or with ETEC maintenance procedures in that it does not have a documented ETEC maintenance plan.

CONCERN: (MA.1-2) (H2/C2) The overall ETEC maintenance program and organizational structure, including the relationship with Rocketdyne Plant Services, is not well defined or understood.

CONCERN: (MA.1-3) (H2/C2) The maintenance program conducted by ETEC on active and inactive facilities has not been effective in preventing the deterioration of these facilities.

CONCERN: (MA.1-4) (H2/C2) The current dual responsibilities of operators for maintenance as well as operation have resulted in plant maintenance items being deferred or neglected.

CONCERN: (MA.2-1) (H2/C2) In most cases, the conduct of maintenance on ETEC test equipment does not address deficiencies in a controlled fashion and does not effectively minimize deterioration of this equipment.

CONCERN: (MA.3-1) (H1/C2) Maintenance facilities and equipment at the SCTI and other ETEC facilities are substandard, particularly with regard to parts control and shop facilities.

CONCERN: (MA.4-1) (H2/C1) Facility maintenance activities at ETEC are currently being conducted without guidance or input from DOE with respect to planning for 1991 and with respect to long-range planning.

CONCERN: (MA.4-2) (H3/C2) In most instances, planning, scheduling, and work control for maintenance activities at the Sodium Component Test Installation (SCTI) and at other ETEC facilities are not conducted in compliance with ETEC Procedure 6-05.

CONCERN: (MA.5-1) (H1/C2) Periodic inspections and corrective maintenance of inactive facilities do not preclude the existence of hazardous conditions, which contribute to the deterioration of these facilities.

CONCERN: (MA.5-2) (H2/C2) The general upkeep and housekeeping at the Sodium Component Test Installation do not meet good industry practices.

CONCERN: (MA.6-1) (H2/C2) ETEC facilities do not have fully implemented preventive maintenance procedures as required by ETEC Procedure 6-05.

CONCERN: (MA.6-2) (H2/C2)
Preventive maintenance procedures being used by the Rocketdyne Plant Services organization do not, in some instances, demonstrate the operability of the equipment being tested.

CONCERN: (MA.6-3) (H1/C1)
In some instances, Rocketdyne Plant Services personnel do not follow lockout procedures as required by 29 CFR 1910.147.

CONCERN: (MA.7-1) (H3/C2)
Predictive maintenance is not used to develop and refine maintenance procedures.

CONCERN: (MA.8-1) (H3/C1)
Maintenance procedures at the Sodium Component Test Installation and other ETEC test facilities are not in every case prepared and controlled in accordance with DOE 1324.2 or ETEC Procedure 6-03.

4.5.5 Training and Certification

CONCERN: (TC.1-1) (H2/C1)
No comprehensive training and qualification program has been implemented at ETEC to meet the requirements of DOE 5480.20.

CONCERN: (TC.3-1) (H2/C1)
Operations personnel training has not been effective, as evidenced by incorrect personnel actions and conduct of operations that does not meet DOE 5480.19.

CONCERN: (TC.4-1) (H2/C1)
Some personnel may not know or understand that personnel protection safety information can be "certified" as evidence of successfully completing training. Successful completion of training need not require a demonstration of knowledge through practical or written examination as required by DOE 5480.20.

CONCERN: (TC.4-2) (H2/C1)
Personnel protection training does not address and prepare workers for many occupational hazards and conditions present in the ETEC facilities, as required by OSHA regulations and DOE Orders.

CONCERN: (TC.5-1) (H3/C1)
A maintenance training and qualification program has not been implemented to meet ETEC Procedure 6-05, DOE 5480.20, and DOE 5480.19.

CONCERN: (TC.7-1) (H3/C2)
No training support facility with equipment and materials is available at ETEC to support training functions.

CONCERN: (TC.8-1) (H3/C1)
There is no formal training and qualification program for inspection or other quality verification personnel as required by ANSI/ASME NQA-1 and DOE 5480.20.

CONCERN: (TC.9-1) (H2/C1)
Radiological protection personnel are not trained and qualified as required by DOE 480.19 and DOE 5480.11.

CONCERN: (TC.10-1) (H2/C1)
Ineffective training of supervisors and managers results in noncompliance with DOE 5480.20.

4.5.6 Auxiliary Systems

CONCERN: (AX.1-1) (H2/C2)
Auxiliary systems at the Sodium Component Test Installation are not identified as such, and functional requirements for these systems are not defined, documented, or maintained.

CONCERN: See Concern MA.5-1.

CONCERN: (AX.5-1) (H2/C2)
In some instances, operating procedures, control mechanisms, and equipment maintenance at ETEC facilities do not ensure control and containment of hazardous, airborne effluents.

CONCERN: See Concern MA.6-1.

CONCERN: See Concerns TS.2-1 and MA.6-2.

4.5.7 Emergency Preparedness

CONCERN: (EP.1-1) (H2/C1)
ETEC has not formally developed an emergency response organization as required by DOE 5500.3 and DOE N 5500.5.

CONCERN: (EP.1-2) (H2/C1)
SAN has not conducted annual emergency preparedness appraisals for ETEC, as required by DOE 5500.1A.

CONCERN: (EP.2-1) (H2/C1)
ETEC has not developed an emergency plan implementing procedures to address the provisions of the Rocketdyne Master Emergency Plan and the requirements of DOE 5500.2A, DOE 5500.3, and DOE N 5500.3.

CONCERN: (EP.2-2) (H2/C1) SAN is not in compliance with DOE 5500.1A in providing guidance to ETEC on emergency preparedness functions.

CONCERN: (EP.3-1) (H2/C1) The ETEC emergency planning training program is not properly documented, evaluated, upgraded, and maintained current as required by DOE 5500.3, DOE N 5500.5, and DOE 5500.1A.

CONCERN: (EP.4-1) (H2/C1) ETEC does not have an emergency planning exercise/drill program as required by DOE 5500.1A, DOE 5500.3, and DOE N 5500.5.

CONCERN: (EP.5-1) (H2/C1) The emergency response facilities at ETEC do not contain the resources, equipment, space, and materials to comply with DOE 5500.1A, DOE 5500.3, and DOE N 5500.5.

CONCERN: (EP.6-1) (H2/C1) ETEC has not developed an emergency plan to implement procedures that address required notifications, emergency action levels, and an emergency classification system as required by DOE 5500.2A, DOE N 5500.5, and DOE 5000.3A.

CONCERN: (EP.7-1) (H2/C1) ETEC has not developed procedures to address personnel protection guidance for both onsite and offsite populations as required by DOE 5500.1A, DOE N 5500.5, and DOE 5500.3.

4.5.9 Technical Support

CONCERN: See Concern OA.1-1.

CONCERN: (TS.2-1) (H2/C2) Approved Operational Safety Requirements are not in place for ETEC facility operations.

CONCERN: (TS.2-2) (H2/C1) ETEC has not documented evaluations showing whether existing safety documentation "adequately assesses the risk," as required by DOE 5481.1B, Chapter I, Part 4, and by SAN MD 5481.1A, Chapter I, Part 4.

CONCERN: (TS.2-3) (H2/C1) The contents and formats of approved and draft ETEC SARS and Safety Analysis Documents do not fully comply with SAN MD 5481.1A guidance for Operational Safety Requirements, quality assurance, and details of safety analyses. Further, not all of these documents meet the DOE 5481.1B and SAN MD 5481.1A requirements for documentation of conformance with applicable guides, codes, and standards.

CONCERN: (TS.2-4) (H2/C2) The ETEC safety analysis documents do not address all significant safety issues.

CONCERN: (TS.3-1) (H2/C2) ETEC does not have a clear requirement for validation of safety-related engineering calculations or independent review of engineering documents other than drawings.

CONCERN: (TS.3-2) (H3/C1) ETEC direction on use of design codes, standards, and regulations mandated by DOE 6430.1A, Section 0106, and DOE 5480.4 does not provide a comprehensive review of all potentially applicable criteria.

CONCERN: (TS.3-3) (H3/C1) ETEC is proceeding in accordance with a requested proposal to deviate from across-the-board application of DOE 6430.1A, even though the requested deviation has not been approved by DOE.

CONCERN: (TS.4-1) (H2/C2) ETEC has no formal, structured, comprehensive program for compiling, trending, and evaluating all relevant equipment performance data.

CONCERN: (TS.5-1) (H2/C2) Not all potentially contaminated air exhausted from Building T059 passes through high-efficiency particulate air filters, nor are all exhaust air streams monitored.

CONCERN: (TS.5-2) (H2/C2) Current air sampling practices do not ensure accuracy of radioisotope release data for Building T059.

4.5.9 Security/Safety Interface

CONCERN: (SS.2-1) (H1/C2) Instructions stipulating unimpeded ingress and egress of emergency vehicles were not included in the Post Orders of the guard post at the entrance to SSFL.

CONCERN: (SS.4-1) (H2/C1) No Operational Assurance (annual audit) program is in place for firearms safety at ETEC, as required by DOE 5480.16, Chapter III, Section 1.b.

4.5.10 Experimental Activities

CONCERN: See Concern TS.2-1.

4.5.11 Site/Facility Safety Review

CONCERN: (FR.1-1) (H3/C1) The ES&H independent internal appraisal system is not "clearly defined in writing," as required by DOE 5482.1B, Section 9.d.(2)(b).

CONCERN: (FR.4-1) (H3/C1) The practice of periodic ES&H reviews of operations, as required by DOE 5482.1B, Section 9.d.(2)(e), has not been established.

CONCERN: (FR.5-1) (H3/C1) Triennial management reviews of the ES&H internal appraisal system, required by DOE 5482.1B, Section 9.d.(2)(d), are not being performed.

4.5.12 Radiological Protection

CONCERN: (RP.1-1) (H2/C1) There is insufficient oversight by all levels of management and supervision within Radiation Protection and Health Physics Services, resulting in a general lack of radiation safety awareness and acceptance of the established procedures and accepted practices required by DOE 5480.11.

CONCERN: (RP.2-1) (H2/C1) The internal audit program does not provide the level of independent oversight of the radiation protection program required by DOE 5482.1B, Section 9.d, DOE 5480.20, and DOE 5480.11.

CONCERN: (RP.2-2) (H2/C1) SAN does not audit ETEC for compliance with DOE 5480.11.

CONCERN: (RP.3-1) (H2/C1) The lack of procedures compromises the technical basis and justification for a number of the components of the radiation protection program required by DOE 5480.11.

CONCERN: (RP.4-1) (H2/C2) Current Radiation Protection and Health Physics Services procedures and health physics reviews do not address all external exposure issues as required by DOE 5480.11.

CONCERN: (RP.5-1) (H2/C1)
Current Radiation Protection and Health Physics Services procedures do not fully describe the conduct and operation of the external radiation dosimetry program required by DOE 5480.11.

CONCERN: (RP.5-2) (H2/C2)
A policy and a procedure do not exist for the use of Direct Reading Dosimeters for radiation exposure monitoring at ETEC.

CONCERN: (RP.6-1) (H3/C1)
ETEC has not demonstrated that the air sampling program will meet the requirements of the DOE Performance Standard for Internal Dosimetry Programs or DOE 5480.11.

CONCERN: (RP.7-1) (H2/C2)
Current Radiation Protection and Health Physics Services procedures do not fully describe the conduct and operation of the internal radiation dosimetry program required by DOE 5480.11.

CONCERN: (RP.10-1) (H2/C1)
Current contamination control, posting practices, policies, and radiation monitoring are not consistently conducted or enforced in a manner that ensures positive control of contamination as required by DOE 5480.11.

CONCERN: (RP.11-1) (H2/C1)
The ALARA program does not meet the requirements of DOE 5480.11 and the DOE ALARA Manual.

4.5.13 Personal Protection

CONCERN: (PP.1-1) (H2/C2) CAT II
Line management has not developed an effective system to implement and enforce health and safety requirements and to maintain workplaces free of health and safety concerns.

CONCERN: (PP.1-2) (H2/C2)
The Rocketdyne Health, Safety and Environment Department does not provide the necessary oversight and technical support to ensure line management implementation of safety and health requirements.

CONCERN: (PP.2-1) (H1/C2)
Guidelines to ensure the generation of reliable data are not in place for environment, safety, and health monitoring activities; and proper and reliable monitoring procedures are not always being applied.

CONCERN: (PP.2-2) (H1/C1) Numerous safety and health procedures, specifications, and guidelines are either not in conformance with Orders and regulations, are not applied and enforced, or are not available, as required by DOE 5483.1A, DOE 5480.10, and various OSHA standards.

CONCERN: See Concerns PP.1-2, PP.3-3, PP.4-2, and PP.5-2.

CONCERN: (PP.3-1) (H2/C2) A coordinated management approach to evaluate and control health and safety hazards, involving both line management and Health, Safety and Environment, has not been established at ETEC.

CONCERN: (PP.3-2) (H2/C1) Management of asbestos-containing materials and abatement activities does not demonstrate compliance with 29 CFR 1926.58 and does not ensure that hazard controls are applied.

CONCERN: (PP.3-3) (H1/C1) The design and management of regulated areas do not ensure containment and control of hazards and are not consistent with various regulatory requirements and DOE 5480.10.

CONCERN: (PP.4-1) (H1/C2) The construction program, including its procurement aspects, does not apply an effective system to implement and enforce safety requirements and correct noncompliances.

CONCERN: (PP.4-2) (H2/C1) A program is not in place to identify, evaluate, monitor, and control credible exposures to chemical, physical, and and safety hazards, in violation of various DOE Orders, such as DOE 5480.10, and OSHA regulations, such as 29 CFR 1926.58.

CONCERN: (PP.5-1) (H2/C1) A program in compliance with 29 CFR 1910.1200, "Hazard Communication," and information systems required by 29 CFR 1910.1450, "Occupational Exposures to Hazardous Chemicals in Laboratories," are not in place.

CONCERN: (PP.5-2) (H2/C1) Effective mechanisms to inform workers and supervisors of hazards associated with their activities are not applied, resulting in lack of hazard recognition and control, as well as noncompliance with various OSHA standards and DOE 5480.10.

CONCERN: See Concerns TC.1-1 and TC.4-2.

4.5.14 Worker Safety and Health Compliance

CONCERN:	See Concern PP.5-1.
CONCERN: (WS.3-1) (H1/C1)	ETEC is not in compliance with the monitoring requirements of 29 CFR 1910.95, Occupational Noise Exposure; 29 CFR 1910.1028, Benzene; 29 CFR 1910.1018, Inorganic Arsenic; 29 CFR 1910.1025, Lead; and 29 CFR 1926.58 Asbestos, Tremolite, Anthophyllite, and Actinolite.
CONCERN: (WS.4-1) (H2/C1)	ETEC does not comply with 29 CFR 1910, Subpart E, "Means of Egress."
CONCERN: (WS.4-2) (H1/C1)	ETEC does not comply with 29 CFR 1910.151(C), regarding suitable facilities for quick drenching or flushing of the eyes and body.
CONCERN: (WS.4-3) (H1/C1)	ETEC does not comply with 29 CFR 1910, Subpart O, "Machinery and Machine Guarding."
CONCERN: (WS.4-4) (H1/C1) CAT II	Electrical hazards presented an imminent danger to employees. ETEC does not comply with 29 CFR 1910.304, "Wiring Design and Protection," and 29 CFR 1920.305, "Wiring Methods, Components and Equipment for General Use."
CONCERN: (WS.4-5) (H1/C1) CAT II	ETEC does not comply with 29 CFR 1910, Subpart S, "Electrical."
CONCERN: (WS.4-6) (H2/C1)	ETEC does not comply with 29 CFR 1910.22(d), "Loading Protection."
CONCERN: (WS.4-7) (H2/C1)	ETEC does not comply with 29 CFR 1910.184, "Slings."
CONCERN: (WS.4-8) (H2/C1)	ETEC does not comply with 29 CFR 1910.101, "Compressed Gases (general requirements)."
CONCERN: (WS.4-9) (H1/C1)	ETEC does not comply with 29 CFR 1910.242, "Hand and Portable Powered Tools and Equipment (general)."
CONCERN: (WS.4-10 (H1/C1)	ETEC does not comply with OSHA Section 5(a)(1), "General Duty Clause."

CONCERN: (WS.5-1) (H1/C1)
ETEC does not ensure that subcontractors control fall hazards to employees during construction activity as required by 29 CFR 1926, Subpart L.

CONCERN: (WS.5-2) (H1/C1)
ETEC does not ensure that subcontractors comply with construction electrical standards, as required by 29 CFR 1926, Subpart K, "Electrical."

CONCERN: (WS.5-3) (H2/C1)
ETEC does not ensure that subcontractors comply with 29 CFR 1926.350, "Welding and Cutting."

4.5.16 Fire Protection

CONCERN: (FP.2-1) (H2/C1)
Not all ETEC facilities are in compliance with NFPA 101 relating to illumination of exit signs and emergency lighting.

CONCERN: (FP.6-1) (H1/C-1)
Rocketdyne has not implemented a physical fitness program for fire fighters as required by NFPA 1500.

CONCERN: (FP.6-2) (H1/C1)
SAN has not provided evidence and direction to Rocketdyne for the implementation of a physical fitness program for fire fighters as required by NFPA 1500.

CONCERN: (FP.6-3) (H1/C1)
The staffing level of the Rocketdyne Fire Department is not commensurate with the fire risk, and does not comply with NFPA 1500.

CONCERN: (FP.6-4) (H2/C-2)
The Rocketdyne Fire Department does not have a training program in place for advancement of firefighter personnel, or a standard for measuring the proficiency of Fire Department personnel.

CONCERN: (FP.6-5) (H2/C2)
The Rocketdyne Fire Department does not have an assigned safety officer as required by NFPA 1500.

4.5.17 Medical Services

CONCERN: *(MS.1-1)* (H3/C1)
The Medical Director is not appropriately involved or supported to be fully informed and able to provide timely input to top management, as required by DOE 5480.8.

CONCERN: (MS.2-1) (H2/C1)	Medical records are not complete as required by DOE 5480.8 and do not meet OSHA standards.
CONCERN: (MS.3-1) (H3/C1)	The medical facilities are not sufficiently spacious and do not provide for privacy as required by DOE 5480.8 or community standards.
CONCERN: (MS.3-2) (H2/C1)	Staffing is inadequate to meet routine and emergency requirements and does not meet industry or DOE 5480.8 standards.
CONCERN: (MS.3-3) (H2/C1)	The physical examination program does not meet requirements of Rocketdyne policies and procedures or OSHA or DOE 5480.8 standards.
CONCERN: (MS.4-1) (H2/C1)	Compliance with company and regulatory standards cannot be ensured without a review and audit program.

4.8 TEAM COMPOSITION AND AREAS OF RESPONSIBILITY

Area of Responsibility	Name/Organization
Team Leader Appraisals	Albert D. Morrongiello Department of Energy Office of Safety
Assistant Team Leader Appraisals	Douglass S. Abramson Department of Energy Office of Safety
Organization and Administration	Lorin C. Brinkerhoff Private Consultant
Technical Support and Experimental Activities	J. Kenneth Anderson Private Consultant
Maintenance and Auxiliary Systems	Lew Masson SCIENTECH, Inc.
Personnel Protection	Gary Gottfried Apex Environmental Inc.
Fire Protection	James E. Biggs Biggs Associates
Operations and Site/Facility Safety Review and Security/ Safety Interface	Leon H. Meyer The LHM Corporation
Radiation Protection	John A. Leonowich Pacific Northwest Laboratories Anthony Weadock Department of Energy Office of Health Physics and Industrial Hygiene
Emergency Preparedness	George Bailey Advanced Systems Technology, Inc.
Quality Verification /Training and Certification	John Johnson J-E-T-S

Worker Safety	Jack J. Janda Environmental Comprehensive Health Services
	William Murphy Murphy & Assoc., Inc.
	Scott Cassady National Biosystems, Inc.
Medical Services	Bernard S. Zager, M.D. Private Consultant

Report Support, Observers and Liaison

Coordinators	Mary Meadows Department of Energy Office of Safety
	Patricia Davidson Department of Energy Office of Safety
	Rita Bieri Los Alamos National Laboratory
Technical Editor	Pamela L. Gurwell Pacific Northwest Laboratories
CPD Project Manager	Satish Khanna Department of Energy Office of Safety
Appraisals	
SAN NE Liaison	Walter Von Flue Department of Nuclear
Energy	San Francisco Operations Office

MANAGEMENT ASSESSMENT

5.0 MANAGEMENT ASSESSMENT

5.1 PURPOSE

The Management Subteam conducted an assessment of ES&H activities performed by DOE and Rockwell (Rocketdyne and ETEC) personnel at the ETEC site. The objectives of the assessment were: (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; and (2) to identify probable root causes for any persistent or repetitive ES&H findings and concerns.

5.2 SCOPE

The scope of the assessment, from an ES&H perspective, included the following: (1) corporate 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, self-assessment, and the award fee process; (6) conduct of operations; (7) DOE management and oversight; and (8) public and institutional interactions.

Interviews were held with managers, supervisors, and staff personnel representing a wide variety of program interests. Interviewees included key personnel from DOE Headquarters, SAN, ETEC, and Rocketdyne.

The Management Subteam examined a number of key management areas including DOE and Rockwell/Rocketdyne/ETEC policies and directive systems, internal operating procedures, self-assessment systems, internal and external communications, and individual performance appraisal systems. Documents reviewed included DOE Orders, Secretary of Energy Notices (SENs), SAN Management Directives, Program budget and planning guidance and Site Contractor submissions, the DOE contract with Rockwell, policies, administrative procedures, implementation plans, Program/Project Management Plans, Management Agreements, standard operating procedures, self-assessments, 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, dated February 1990. The Management Subteam also relied upon the draft document, "Management Performance Objectives and Criteria for Tiger Team Assessments," dated July 1990. 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 and Safety and Health Subteams 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 March 18 and April 12, 1991. A list of those individuals contacted by the Management Subteam is provided in Appendix C-2. A list of the Subteam members is provided in Section 5.7; biographical sketches of the Subteam members are provided in Appendix A-4.

The Subteam initially developed an understanding of the organizational roles, responsibilities, and authorities of SAN, ETEC, and Rocketdyne relative to management objectives and expectations for management of ES&H activities. This was followed 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 ES&H functions and operational programs at ETEC. The Subteam then conducted interviews and developed an understanding of perceptions of DOE Headquarters, ETEC, and Rocketdyne concerning ES&H activities at ETEC, ES&H policies and goals, and the adequacy of supporting documentation.

To further support the Subteam's assessment, daily debriefings and consultations were held with the Environmental and the Safety and Health Subteams. The objective of these interactions was to uncover potential management and organizational problems that might be common to the findings of all Subteams. Preliminary data and conclusions were developed, checked, and validated through document review, consultation with regulatory agencies, and discussions with managers and supervisors at SAN, Rocketdyne, and ETEC.

5.4 MANAGEMENT ASSESSMENT SUMMARY

ETEC, which is a part of the Rocketdyne Division of Rockwell International Corporation, has roughly 150 personnel and an annual budget of approximately $32,000,000. Its primary mission is to provide non-nuclear component testing services to DOE and to other clients through a Work For Others Program. Over the past several years, the scope of work and budgets at ETEC have been declining, and the future role of ETEC from a DOE perspective is uncertain. However, as indicated in an Organizational and Cultural Assessment, conducted by Brookhaven National Laboratory for the Tiger Team, personnel do take pride in their work, and generally express satisfaction with their jobs.

In preparation for the Tiger Team Assessment, DOE-SAN and the Site Contractor have performed numerous inspections and audits to assess the current status of compliance with ES&H requirements. A large number of deficiencies and ES&H program weaknesses were identified. Many of the individual deficiencies have either been corrected or have the needed corrective actions in progress or scheduled. Many improvements in physical conditions, procedures, and processes were apparent.

For at least the past 6 years, ETEC facilities and activities have been classified as low hazard and low risk by the Site Contractor. As a result, there has not been the inherent awareness of the need for formality and rigor in the performance and documentation of ES&H activities at ETEC that usually exists at high hazard facilities. The Management Subteam has considered the degree of hazard at ETEC in the development of findings. Notwithstanding this need to apply a graded approach to most areas of the assessment, certain fundamental aspects of sound management must be in place and functioning to achieve the DOE ES&H initiatives. The Management Subteam observed a number of weaknesses in DOE-HQ, SAN, and Site Contractor management policies and practices and have identified these weaknesses in 12 findings. The Subteam identified the following key findings regarding management's effectiveness in establishing and implementing ES&H at ETEC:

- Contractor organizational and individual ES&H roles, responsibilities, and authorities have not been defined, communicated, or understood throughout all levels of the organization.

- ES&H activities at ETEC are not being performed with the degree of formality and rigor necessary to meet DOE policies, requirements and guidelines for the operation of DOE facilities.

- The Site Contractor has not established an effective program of oversight of its ES&H activities.

- DOE's oversight and guidance of ES&H activities at ETEC is not sufficient to ensure full implementation of DOE's ES&H initiatives.

There are two primary reasons for these deficient areas: (1) the failure of Site Contractor management to fully understand and effectively communicate the new attitudes and philosophy needed to achieve full implementation of DOE's ES&H initiatives and to assure that the changes have been effected; and (2) the long history of low priority accorded ETEC ES&H activities by the DOE and the Site Contractor.

5.5 MANAGEMENT FINDINGS

FINDING MF-1 Comprehensive Sitewide Strategic Planning Process

Finding

ETEC does not have an integrated sitewide strategic planning process which incorporates ES&H activities on a prioritized basis.

Discussion

Strategic planning is an essential management tool in that it provides a systematic process for balancing scarce ES&H resources, staff acquisitions, training and certifications, competing capital improvements, and facility modifications and improvements against the long-term ETEC missions and goals. Good strategic planning provides ETEC and the DOE: (1) a vision or scope of what is expected (i.e., specific ES&H goals), (2) a process for deciding how to achieve what is expected (i.e., short-term and long-term priorities and options), and (3) a system to measure accomplishment of the goals (i.e., cost and schedule baselines).

Currently, ETEC strategic planning is fragmented and there is no comprehensive and integrated assessment of what the ES&H requirements are, how best to address these requirements, or what resources are required. Two factors appear to contribute to the lack of ES&H strategic planning: (1) the lack of ES&H proficiency in line management, and (2) the current system of budgeting for ES&H in the Rocketdyne overhead pool which reduces the visibility given to ES&H requirements. In addition, allocating necessary resources for ES&H staff and site improvements are especially difficult at ETEC given the declining budgets at the site.

An integrated strategic plan for staffing and funding for ES&H requirements provides an effective tool to increase awareness of the ES&H issues and deficiencies. To date, no such plan exists. The DOE has not requested a plan nor has the Site Contractor prepared one.

Self-Assessment

This issue has been identified in the SAN and ETEC Self-Assessments.

FINDING MF-2 Lack of Clear Organizational ES&H Roles, Responsibilities, and Authorities

Finding

The Site Contractor's organizational ES&H roles, responsibilities, authorities, and interfaces are not clearly defined, communicated, and understood throughout all levels of the organization.

Discussion

The Site Contractor maintains up-to-date organization charts which reflect the current organizational structure, and has many of the hierarchical documents that describe the ES&H organizational missions. However, there is considerable evidence that there is not a clear understanding by all of the organizational units involved in ES&H activities at ETEC as to their roles, responsibilities, and authorities, as well as the relationships among such units.

For example, there is a lack of clear definition in the formal assignments of responsibilities between the line safety organizations and the safety oversight organizations, and in the commensurate delegations of authorities to carry out these responsibilities (see OA.4-1). Interfaces between ETEC operations personnel and Rocketdyne Plant Services are insufficiently clear to establish the authority for control over maintenance activities performed on plant process equipment (see OP.5-1 and MA.1-2).

In the absence of ES&H expertise in the ETEC line organizations, ETEC line managers must, on a daily basis, obtain ES&H services from a number of different sources. For example, ETEC matrixed personnel will furnish such services as fire protection engineering, safety analysis, and design modification; other ETEC organizations will furnish advice on such matters as compliance status, applicability determinations, equipment, and training needs; and Rocketdyne divisions will furnish oversight services and additional support. The success of this arrangement requires that organizational roles and interfaces be cohesive, clearly delineated, and understood.

In important respects, the ES&H activities lack cohesion and are organizationally fragmented. Not only must the ETEC line manager look outside of his organization for ES&H expertise, but when he looks to Rocketdyne for such expertise he finds, for example, that safety, health, fire protection, and emergency functions are located in one department (Human Resources & Communications), and that environmental and facility maintenance functions are located in another department (Production Operations). While there may be sufficient business reasons for these functional separations, they raise the spectre of overlapping and poorly understood responsibilities and authorities. Furthermore, there are no ES&H organizations at Rocketdyne that are dedicated to DOE requirements; DOE must compete for resources and management attention with larger customers such as NASA and DOD. The impact of the recent reorganization, which has the ETEC General Manager reporting to a Rocketdyne Vice President rather than to the President to whom he previously reported, is too recent to assess.

The lack of definition and comprehension of ES&H organizational roles and authorities is manifested in numerous examples of uncertainty at all levels of the organization (see OA.4-1 and OA.1-3). For example, stop work authority, a fundamental element in ensuring that activities with potentially adverse ES&H consequences are curtailed at the earliest possible time, is not widely understood throughout the organization. Many of those who have full authority do not understand how to exercise it, could not identify the source of their authority, and are unaware of procedures for resumption of activities after the work has been stopped. A proposed ETEC procedure, currently in draft, is intended to bring clarity to this area.

There are further examples of the failure to understand ES&H organizational roles and authorities. Multiple organizations manage the inactive waste site program without recognition of the need for coordination (see IWS/CF-2). The ETEC Safety and Health Coordinator's understanding of his role is not consistent with that which is assigned to his office by ETEC procedures (see OA.2-1). Confusion exists with regard to responsibility for assuring that visitors and guests are knowledgeable of potential hazards at the site and of the procedures designed to minimize risks to personnel (see RP.1-1).

Self-Assessment

The SAN and ETEC Self-Assessments identified these issues.

FINDING MF-3 Individual ES&H Roles, Responsibilities, Authorities, and Training

Finding

The Site Contractor has not communicated personal ES&H responsibility and accountability throughout all levels of the organization or provided the necessary training to ensure effective performance of the ES&H responsibility.

Discussion

While there is much evidence, documented and otherwise, that ETEC management is committed to the policy that ES&H is the responsibility of every employee, it has not taken the necessary formal actions to make such responsibility an integral part of every employee's job.

A principal responsibility of management in an ES&H program is to establish the goals and objectives of the organization, together with subordinate measurable goals and objectives that can be related to each individual's work. These must then be documented and communicated so that they can be embraced by the work force. Although the Site Contractor's stated overall goal is an effective ES&H program that is in compliance with all applicable regulations and directives, interviews with staff at all levels of the organization reveal a lack of awareness of any specific ES&H goals. Since the overall organizational goal has not been translated into personal goals and objectives, there can be no effective measurement of progress toward the overall goal or an understanding of the individual's role in its accomplishment. The many interfaces required between ETEC and Rocketdyne personnel to support and oversee ES&H activities, and the multiple functions of management and staff in the ES&H area, make it especially important that personnel understand their respective roles, responsibilities, and authorities (see MF-2).

Site Contractor personnel are covered by Rockwell/Rocketdyne job descriptions based on a company job code. Examination of a representative sample of such job descriptions discloses that unless the job is in the ES&H area (e.g., Safety & Environmental Health Specialist), the description is not likely to incorporate ES&H elements. Nor is there any company policy to require such incorporation. Job descriptions are, in many instances, outdated, are not generally discussed with the employee, and are not periodically reviewed for relevance; they do not generally exist below the manager level.

The establishment of specific, personal ES&H goals, objectives, and performance measures for all employees is a valuable method for management to communicate its declared commitment to the accomplishment of DOE's ES&H initiatives. The Performance Review Management Personnel (for managers) and the Employee-Manager Job Planning and Achievement Review (for non-manager salaried and weekly employees) are designed to lead to annual "mutual agreement" in the areas of job responsibilities, results achieved, and "future plans." Its principal purpose is to improve performance by providing clear job expectations and timely feedback on accomplishments. Accordingly, it is also an appropriate vehicle for management to carry its overall ES&H goals and objectives into job-specific goals and objectives throughout the organization. However, the operative forms utilized in this process (Forms R-47-N-7 and R-47-N-8) include no mention of ES&H elements. Nor is there any evidence that, in practice, such elements have been made a part of the evaluation process. Furthermore, many hourly paid personnel never receive any kind of written or oral evaluation of their performance (see OA.6-1).

Employees who have been assigned ES&H roles and responsibilities, and who will be held accountable for their performance, must be provided with the necessary training, retraining, and certification. The Site Contractor has not implemented formal, documented, and comprehensive sitewide ES&H training, retraining, certification and career development programs to ensure that ES&H activities are conducted by fully qualified people. Each Rocketdyne division is responsible for identifying its training requirements and establishing a staff training and development baseline. However, ETEC management has not systematically identified its site-wide training requirements. As a result, its training program is fragmented, incomplete and informal, and training deficiencies are pervasive (see Findings GW/BMPF-2, GW/BMPF-4, SW/CF-3, SW/CF-3, SW/BMPF-2, NEPA/CF-2, and IWS/CF-4). Such deficiencies have resulted in a lack of understanding of DOE requirements in such ES&H areas as NEPA, radiation protection, fire protection, groundwater monitoring, and OSHA. Interviews revealed that many ETEC managers have not had recent ES&H training, that they rely on out-dated procedures to determine training requirements, and that they often conduct "training" by giving new material to staff to read without assuring their understanding other than by a sign-off.

ETEC recently established the position of ETEC Training Coordinator. Although the position is not full-time and its authority is limited, it is a positive step in improving site training.

Self-Assessment

These issues were identified in the ETEC Self-Assessment. The SAN Self-Assessment only addressed the training aspect of this finding.

FINDING MF-4 Absence of Independent ES&H Oversight Program

Finding

The Site Contractor does not have an independent ES&H oversight program consistent with applicable requirements for assuring comprehensive, effective, and objective ES&H review.

Discussion

One of the cornerstones of an effective ES&H program is an independent oversight function to advise management regarding the organizations degree of compliance with applicable requirements and good ES&H practices. DOE Orders 5480.1B, 5482.1B, 5480.5, and 5700.6B define requirements for contractor independent review and appraisal systems. There are many specific requirements such as periodic internal appraisals of facilities and safety disciplines, review of safety documents, review of modifications, documentation, auditability, technical competence, and independence.

A review of the Site Contractor's independent review activities against the DOE Order requirements indicates a satisfactory system related to safety document reviews and facility modifications. However, in almost all other areas there are deficiencies, for example:

- There is no triennial review of the independent review system which, if performed, would have identified many of the following deficiencies (see FR.5).
- There are no internal appraisals of safety functional disciplines (e.g., fire protection, radiation protection) except for some performed by the QA organization. However, since the QA organization does not have safety expertise these are audits against requirements rather than technical performance (see QV.1 and FR.1).
- Appraisals that are performed are mostly OSHA-type appraisals. Annual facility appraisals covering all safety disciplines are not performed (see FR.4).
- There is no independent review of the Radiation Protection and Health Physics activities at ETEC other than that recently performed by the QA organization (see RP.1).
- The environmental oversight activities carried out by the Environmental Control and Energy Conservation organization lack sufficient independence from their line support activities (i.e., waste management and environmental support to ETEC programs).

- No single nor combination of Site Contractor standing committees provide the oversight roles and responsibilities required by the cited Orders.

- Appraisal activities are not multidisciplinary (see QV.6).

- With the exception of OSHA-type and QA findings, there is little tracking, trending, and root cause analysis of findings (see OA.5).

- There is no lessons learned program based on internal findings and events nor the incorporation of experiences from outside organizations (see QV.1).

Cross References

See OA.2, OA.4, OA.5, RP.1, RP.2, PP.1, PP.3, PP.4, FR.1, FR.4, FR.5, TS.3, WS.1, WS.3, QV.1, QV.6, and MS.4

Self-Assessment

The SAN Self-Assessment did not identify this finding. The ETEC Self-Assessment identified only the triennial appraisal, tracking, trending, root cause, and lessons learned aspects of this finding.

FINDING MF-5 Lack of Effective and Integrated ES&H Performance Monitoring

Finding

ETEC management does not have an effective and integrated ES&H performance monitoring and assessment system on which to determine the status, of and base decisions regarding ES&H.

Discussion

An effective performance monitoring and assessment system includes the tracking, root cause analysis, trending, lessons learned, prioritization, taking corrective action, and closure of ES&H matters.

That it is essential to have this system in place was recently stressed by Secretary Watkins in his letter of July 31, 1990, to the Managers of DOE Operations Offices, Subject: "Guidance on Environment, Safety, and Health Self-Assessment." In this letter, the Secretary reiterates the need for formal systems to track findings and take corrective actions, perform root cause analyses, and to identify trends and mechanisms to communicate root causes/trends/lessons learned throughout the organization and incorporate them into daily operations and planning. Effective systems to perform these actions are not in place at ETEC.

There are no ES&H performance indicators in use at ETEC aside from standard DOE accident reporting indices. ETEC is in the process of developing a more comprehensive list of performance indicators based on the guidance recently received in SEN-29-91.

Tracking systems should provide management with timely, accurate information to make sound decisions on ES&H issues. There is no comprehensive and integrated ES&H tracking or trending system at ETEC. Some tracking and trending of OSHA-type inspection and QA findings (e.g., Non-Conformance Reports) are available, but they do not convey a comprehensive picture of ETEC ES&H activities. In addition, status reports from these systems are not always provided to upper management for their review and action.

ETEC performs only limited trend analysis of findings. No central data base exists to accomplish this trending. Therefore, upper management does not have the information available to determine if similar problems exist throughout ETEC and, if common, implement more effective solutions to systemic problems.

The only root cause analysis done at ETEC is related to Unusual Occurrence Reports (UORs). No procedure for determining when and how to perform root cause analysis currently exists although one is being developed. Such analysis is essential to determining the fundamental reason a deficiency exists. Once that reason is identified, then the "cause" can be corrected to ensure the deficiency is not repeated.

There is no lessons learned program to convey the results of ETEC experiences or related external experiences to the ETEC staff.

Prioritization of findings is not being performed at ETEC. Prioritization is important to ensure that scarce resources are directed, in appropriate sequence, to the most critical ES&H issues.

Closure of findings have not been effective. There are open audit findings dating back to 1988, and responses to findings do not always fully address the identified issues. The QA review of completed operations and test procedures identify repetitive deficiencies, but these deficiencies are not formally documented, evaluated, or communicated to higher management for long-term corrective action (see MF-6).

Cross References

See OA.5, QV.1, MA.2, and TS.4

Self-Assessment

The SAN Self-Assessment identified only the root cause analysis aspect of this finding. The ETEC Self-Assessment identified aspects of the root cause, tracking, and trending problems, but not in the context of an integrated performance monitoring and assessment system for management. However, discussions with ETEC management indicate their intention to develop an appropriate integrated performance monitoring and assessment system.

FINDING MF-6 Conduct of Operations

Finding

The requirements and guidelines for the conduct of operations at ETEC facilities have not been adequately implemented.

Discussion

In November 1989, the DOE Under Secretary issued a memorandum to DOE Operations Offices providing interim guidelines for the conduct of operations and instructions for implementation by DOE Site Contractors. In July 1990, DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities, was issued directing DOE contractor application of a set of guidelines attached to the Order and documentation of conformance with the requirements of the Order. In December 1989, SAN requested the Site Contractor review Institute for Nuclear Power Operations (INPO) guidelines for their applicability to ETEC operations. The response, dated January 17, 1990, concluded that ETEC largely complied with the applicable INPA guidelines with actions required in four areas. After publication of DOE Order 5480.19, dated July 1990, and, as a result of pre-Tiger Team self-assessment activities, ETEC developed a matrix showing the applicability of the guidelines to ETEC activities, the perceived conformance, and these actions required has now been completed. The matrix identified over 60 action items in 15 of the 18 basic areas. However, the review of INPO guidelines and the matrix, as well as the other ETEC and SAN assessment efforts, focussed primarily on the existence of programs or procedures, not on actual performance or implementation of the guidelines. In addition, there is no documented general policy or an overall action plan concerning conduct of operations which clearly communicates the expectations and the scope of changes needed to comply with the new requirements.

In a number of areas ETEC procedures and practices generally conform to the Order 5480.19 guidelines, and numerous changes and improvements have recently been initiated in activities related to the conduct of operations. For example, the Sodium Component Test Installation (SCTI) Operations required reading program, although still being proceduralized, has been in place for some time and appeared to be adequate, and SCTI system and component labeling in general was good. In general, calibrating, operating, and testing procedures were very detailed, required step-by-step performance sign-off, and required several levels of review and approval at completion.

However, the Tiger Team did identify many examples where operating practices do not achieve the required level of performance. Many of these examples reflect a lack of knowledge and understanding of the guidelines and the need to effect a "culture change" at both the management and working levels at ETEC. Weaknesses in the implementation of the conduct of operations guidelines were noted in the following areas:

- A policy of strict procedural adherence has not been effectively communicated to all personnel. Administrative and implementing procedures do not always provide effective guidance and controls for normal and emergency operations and maintenance.

- The General Policy Statement and implementing instructions related to procedure development, use and adherence promulgated in the ETEC Procedures Manual have not been effectively implemented. Numerous examples of inadequate procedures, failure to follow procedures, and improper action to correct procedure deficiencies are identified in this finding and in TSA assessment sections related to Quality Verification, Maintenance Operations, Emergency Preparedness, Auxiliary Systems, and Radiation Protection.

- ETEC administrative procedures, typically, contain numerous generalized requirements without reference to specific implementing procedures, documentation requirements, or accountability for the actions required.

- Program Operations Department Directive PODD-5, Equipment Clearance and Release Order (ECRO), does not adequately address documentation of as-left equipment positions and post-maintenance and post-modification testing.

- The change control process for test and operating procedures is inadequately controlled and improperly applied. There is no formal requirement or guidance for performing verification and validation reviews of new and revised procedures.

  - Procedure redlines are not always initialed and dated, approved, or entered on the Change Approval Log as required by ETEC 6-03.

  - The documentation of changes to procedures to correct inadequacies and adapt to changing conditions is required and laudable. However, many existing procedures still need numerous redline changes when required for use. For example: 355-SOP-1442, Rev C, needed 10 changes; 355-CAP-4014, Rev I, needed 15 changes; and 355-ATP-0008, Rev C, needed 34 changes. Test and operating procedures for a new configuration at a test facility can be expected to require changes and enhancements. However, the number and extent of the changes required for approved SCTI procedures is excessive and indicates inadequacies in the preparation and review process. These conditions are of special concern when they involve Corrective Action Procedures (CAPs) which are the abnormal or emergency operating procedures. Operators should not be identifying or generating procedure changes during the response to an event.

  - Eight of ten completed SCTI test and operating procedures reviewed by the Tiger Team contained unidentified errors and omissions, including: missing sign-offs, unclear data, calibration data out of tolerance, failure of the procedure text to refer to performance of addended redlined steps, lack of acceptance criteria, failure to perform steps, recording of wrong or out-of-tolerance data, failure to attach referenced/companion data sheets or completed procedure sections.

- Of 157 individual readings recorded by SCTI operators on the standard round sheets, 99 have no acceptance criteria specified, only 52 have an acceptance range specified, and six have only an absolute value specified. A review of completed round sheets indicated that out of tolerance readings are not highlighted, are not always promptly corrected, and there is no indication of the corrective action taken, if any. Notes of observed deficiencies such as a leaking pressure relief valve are not acknowledged, nor is any corrective action specified.

- The controls on work activities such as maintenance and modifications are not always clearly defined and documented.

- ETEC Operations personnel do not appear to have sufficient control over the activities of Rocketdyne Plant Services personnel performing troubleshooting or maintenance on process equipment. For example, ETEC Operations personnel do not appear to have authority to require, review or approve procedures or instructions for Plant Services activities. ETEC Procedure 6-05, ETEC Test Facility Maintenance Program, does not address maintenance activities performed by personnel outside of the ETEC organization. ETEC Procedure 2-35, Utilization of Rocketdyne Plant Services for the Maintenance of ETEC Real Property, which states that "programmatic equipment" is included under that procedure, does not address any technical, safety or operational controls over these work activities; only cost and schedule considerations.

- Program Operations Department Directive PODD-5, Equipment Clearance and Release Order (ECRO), does not clearly define what specifically is required for the Person-in-Charge (PIC) to verify the completeness of work performed. The procedure does not adequately address post-maintenance testing requirements.

- Numerous discrepancies in the ECRO log indicate a lack of rigor in documenting and controlling safety clearances. Observed discrepancies included control stub holders not signing off on the release for return to service, the PIC signing off a verification that work is complete and tags may be removed at the same time that he signs off that all tags have been removed, and personnel signing for issuance of a master tag stub after the PIC has signed off the release for equipment return to service.

- Current practices for controlling maintenance include the use of multiple work requests and a variety of types of control documents (e.g., Operations Department with Requests (ODWRs), Emergency Work Requests (EWRs), Plant Services Work Requests (PSWRs), Operations Work Requests (OWRs), procedures) which often do not reference each other or provide continuous tracking of work activities. This lack of continuity does not provide assurance that all work is complete and the component or system has been restored to proper conditions. Administrative procedures and actual practice do not clearly define when each type of control document either must or can not be used. For example, ODWR-91-008 which installed a replacement valve, included instructions for over 60 valve manipulations (many required to be in sequence) or verifications, performance of three sections of an Acceptance Test Procedure (ATP), construction of a hanger, and reworking of piping and valves. However, this complex "procedure" did not require any sign-offs by the performer(s), but only one sign-off by the Shift Leader on the coversheet that the work was completed. As a consequence, the referenced ATP sections were not attached and there is no documentation that the steps for two of the three sections, readjustment of pressure regulator setpoints, have been performed.

- Retest or post-maintenance and post-modification testing often are not delineated on work documents. For example, ODWR 91-004 replaced defective electrical cable, but does not specify or reference any continuity check of the new cable or a functional test of affected components.

- EWRs are not consistently filed to document the completion of work (which also include QA Non Destructive Evaluation (NDE) sign-off documentation), do not have the "inspection required yes or no" blocks checked (or are checked "no", but require QA inspection sign-off in the text), do not have completion dates recorded on original record copies, have redline changes without the required approval signatures, and do not specify any retest requirements.

- Configuration control for plant procedures, equipment and systems is not adequately formalized and is not always maintained.

- ODWRs which have been marked indicating that a master document (e.g., drawing, specification, procedure) revision is required are not all being logged or tracked to assure proper documentation of as-built conditions (ODWR 91-004 and 91-044 for example). Many ODWRs that are on an Engineering Department data base date back to 1988, but still have not been incorporated into the master documents.

- Completed Measurement System Calibration Procedure (MSCP) 355-MSCP-1294 contained an unsigned sketch showing installation of a "FT-1455-1 Transducer R-Cal Resistor." This apparent modification was not part of the original procedure or redlined into the procedure. There is no indication if this was a temporary or permanent installation, nor were any provisions made for removal of the resistor or incorporation into as-built drawings.

- A redlined step in 355-ATP-0008 (completed in October 1990) required installation of a temporary jumper. There was no step in the procedure to remove the jumper.

- PODD-5, Equipment Clearance and Release Order, does not require documentation of the as-left position or status of equipment when released for return to service.

- The SCTI control room logs do not consistently reflect the final status or position of equipment subject to maintenance or troubleshooting activities.

- ETEC procedures do not require any independent verification of electrical or mechanical equipment positioning for important or critical process applications.

- SCTI Operations Department round sheets indicate an acceptance range for Argon system pressure downstream of PCV-702A-B and PCV-702B-B of 100-120 psig which is not consistent with 355-ATP-0008 which specifies 115 +/- 5 psig.

- Management and QA oversight related to the conduct of operations is not adequately structured, documented or effective in identifying and correcting deficiencies and in addressing root causes and actions to prevent recurrence.

- There is no ETEC-wide policy requiring formal management and supervisory walkthroughs. The walkthroughs that are performed are informal, sporadically performed and seldom documented.

- No QA audits have been performed directly addressing conduct of operations. Line responses to Audit Report A-506 (issued November 27, 1989) of conduct of operations related activities such as training and procedure changes were not timely, not responsive to the issue, nor effective in preventing recurrence of the deficiencies. In addition, a response to this audit, dated March 16, 1991, indicates a lack of understanding or appreciation by ETEC management of the importance of procedural controls and adherence in achieving safe and reliable operations.

- Supervisory, management, and QA reviews that are documented on every completed SCTI operations and test procedure failed to identify numerous technical and documentation errors and omissions. The numerous and repetitive deficiencies that are identified by the QA reviewer are not formally documented, tracked or trended, or formally elevated to higher management to effect long term corrective action.

Cross References

See OA.1-3, OA.7-2, QV.1-4, QV.1-5, QV.1-6, QV.1-7, QV.1-8, QV.4-1, OP.3-1, OP.4-1, OP.5-1, MA.1-2, MA.2-1, MA.4-2, MA.6-1, MA.6-2, MA.6-3, MA.8-1, AX.5-1, EP.2-1, EP.6-1, EP.7-1, TS.2-1, FR.4-1, RP.1-1, RP.3-1, RP.10-1, PP.2-2, and PP.3-2

Self-Assessment

The SAN Self-Assessment did identify a few elements of this finding, but did not capture the general failure in the implementation of DOE 5480.19 or refer to this issue in the Executive Summary. The ETEC Self-Assessment identified many of the elements of this finding, but determined that a significant degree of conformance to DOE 5480.19 existed and with the exception of the staffing and training of SCTI operations personnel, only "modest corrective action" was required to achieve compliance. Both Self-Assessments focussed primarily on the existence of programs and procedures rather than actual performance.

FINDING MF-7 Absence of ES&H Requirements in Work For Others

Finding

ETEC does not have a formalized process for ensuring that ES&H requirements and future obligations are considered as part of the Site Contractor submission of proposals for Work For Others.

Discussion

ES&H is a component of all work performed by the Site Contractor. The nature of ES&H requirements may vary; however, a commitment to perform any work should include a review of how that work will affect ES&H prior to the submission of proposals for any Work For Others. Whether the work may involve special permits, is unusually dangerous, involves hazardous or toxic chemicals, or may leave behind residual environmental hazards or requirements are important factors requiring consideration in approving proposals for Work For Others.

In discussions with the Site Contractor and DOE, no formalized process existed for considering ES&H prior to submitting proposals for Work For Others. The Site Contractor indicated that it was a part of the process; however, the system relied on the individual investigator first recognizing potential ES&H needs and second relied on the investigator seeking ES&H advise or review before submitting Work For Others proposals for Site Contractor or DOE approval.

Currently, there is no formal requirement for ES&H review by the Site Contractor or DOE of Work For Other proposals as a necessary step in the process.

The Site Contractor and DOE have made improvements in the process. The proposal forms for Work For Others, which are prepared and forwarded to DOE, now include sections specific to ES&H. Two sections have been added: one to address ES&H requirements, and one to address the costs associated with these ES&H requirements. This improvement, if accompanied by the appropriate ES&H review, will improve the process and should provide reasonable assurance that ES&H risks are evaluated and minimized.

Self-Assessment

This issue has been identified in the SAN Self-Assessment.

FINDING MF-8 Inadequate DOE ES&H Oversight at ETEC

Finding

DOE ES&H oversight of the contractor is inadequate to assure that an effective ES&H program exists at ETEC consistent with requirements.

Discussion

DOE's policy as stated in DOE 5482.1B is to assure protection of the environment and the health and safety of the public and employees of DOE and DOE contractors through compliance with applicable requirements. This assurance, in part, is provided through the program line management and field office oversight activities required by DOE 5480.1B, 5482.1B, and 5700.6B and applicable SENs.

The Assistant Secretary for Nuclear Energy (NE), who has "landlord" responsibility for ETEC, has not provided effective oversight of ES&H activities at ETEC. While NE recognizes and accepts line management responsibility for ES&H, it has not fully implemented the organizational changes to address this responsibility. The NE Office of Facilities, Fuel Cycle and Testing Programs (FFCTP), the line organization responsible for ETEC, has access to two ES&H professionals in the Technical Support Division (TSD) to support all of FFCTPs activities including ETEC. The TSD Director and Operational Safety and Radiation Protection Group Leader positions are vacant. The few ES&H professionals in NE must devote their oversight attention to many activities and sometimes lose their necessary independence (see MF-10).

The inadequacy of NE's oversight of ETEC activities is evidenced in several ways. NE management acknowledged that the last comprehensive ES&H oversight assessment of ETEC occurred eight years ago. In addition, NE sends only broad, general ES&H guidance to the Site Contractor. NE's approach has been to provide the contractor with ES&H direction through the Cost Plus Award Fee (CPAF) process. While this approach can be effective in the short term, it cannot provide the contractor with the long term guidance necessary to prepare for future ES&H activities.

NE has taken recent actions to enhance its ES&H oversight of contractor activities. A Memorandum of Understanding (MOU) has been formalized between SAN and NE to provide day-to-day oversight of ETEC activities. In addition, NE has begun to add ES&H expertise to its line management organizations and is considering establishing an ES&H coordination and assessment group with independence from line management activities.

The Office of ERWM has programmatic activities at ETEC which it conducts through the SAN Environmental Restoration and Waste Management Division. However, this relationship has not been formalized through an EM/SAN MOU. EM looks to SAN to provide day-to-day programmatic ES&H oversight of ETEC activities. In addition, SAN participates in semi-annual and annual program reviews and contributes to the Environmental Restoration and Waste Management Five-Year Plan. Formal monthly status reports, weekly conference calls, and informal monthly meetings communicate expectations and accomplishments between EM and SAN.

Although SAN has recently provided substantial ES&H oversight of ETEC in preparation for the Tiger Team, the functional and management appraisals of ETEC required by DOE 5482.1B or 5700.6B have not been performed since 1988. Although ES&H evaluations are an important part of the CPAF review of the Site Contractor, DOE 5482.1B specifically states that these reviews "are an adjunct to, not a substitute for, management appraisals." This same language is used with regard to the performance of functional appraisals.

While the reestablishment of the ETEC Site Office may be beneficial, the office has not been vested with either the responsibility or the authority to carry out the Secretary's mandated oversight activities. One of the principal activities to be performed under the proposed SAN Site Office concept is the development of an ES&H/QA Management Plan. This plan would establish an appraisal schedule and commitment to perform the required appraisals at ETEC consistent with requirements.

SAN does not have an independent QA organization or staffing other than the QA capability found in the line organizations. The OIIO fulfills some aspects of QA oversight, but its role is primarily to review SAN activities (in order to determine the effectiveness of SAN oversight OIIO will, on occasion, appraise some Site Contractor activities). Therefore, the requirements for DOE oversight of Site Contractor activities contained in DOE 5700.6B are not being fulfilled at ETEC.

Past SAN ES&H appraisal reports were sent to the responsible SAN line organization. These reports were not always forwarded to ETEC in a timely fashion to correct deficiencies cited. In addition the absence of on-site SAN representation resulted in poor follow-up. The reestablishment of a SAN Site Office at ETEC could correct this problem. The delayed closure of appraisal findings is exacerbated by the lack of an effective SAN ES&H tracking, trending, and management reporting system.

Cross References

See OA.5, MA.4, EP.2, TS.3, SS.4, FP.6, EP.1, and RP.2

Self-Assessment

NE and EM have not performed Self-Assessments. The SAN Self-Assessment identified all aspects of this finding.

FINDING MF-9 Cost Plus Award Fee (CPAF) Process

Finding

The CPAF process, as implemented by DOE at ETEC, does not provide an accurate evaluation of the Site Contractor's ES&H performance and does not, therefore, furnish the appropriate incentives for enhanced ES&H performance.

Discussion

The Site Contractor manages and operates ETEC under a prime contract with DOE which provides for a CPAF. As stated in the current Performance Evaluation Plan, the objective of the process is "to afford the Contractor an opportunity to earn increased fee commensurate with the achievement of optimum Contract performance." Accordingly, the process should motivate and reward desired performance and effect changes in undesired performance. However, it is apparent that the process is not providing an accurate evaluation of the Site Contractor's ES&H performance, and cannot, therefore, materially contribute to significant Site Contractor improvements in such performance.

The essential elements of the CPAF process appear to be in accord with current DOE policy and practice: the ES&H performance emphasis has increased from less than 2 percent of the total possible award fee rating in FY 88, to 55 percent in the most current rating period; performance objectives and criteria are generally capable of being objectively measured; reasonable milestones are present; and DOE Headquarters involvement of all responsible offices occurs during the process.

Although the machinery of the process is in place, implementation of the process by DOE has been deficient. Based upon the findings and concerns identified in this Tiger Team Assessment, the high marks that the Site Contractor has received in recent years for its ES&H performance do not reflect the actual condition of such performance. For example, for the first half of FY90, ES&H performance was rated "Excellent," was awarded 94 percent of the available points, and the Site Contractor was told that "Rockwell has met virtually every policy item for the (ES&H) performance area." (Letter, Pearman to Gibbs, dated June 8, 1990) For the second half of FY90, ES&H performance was rated "Excellent," was awarded 92 percent of the available points, and the Site Contractor was told that "ETEC's groundwater and surface water monitoring programs have been excellent." (Letter, Pearman to Gibbs, dated December 7, 1990)

SAN has identified this divergence from reality and has commenced a study of its CPAF process with a view to ensuring that the process receives the necessary management attention to result in evaluations that better reflect actual performance.

Self-Assessment

The ETEC Self-Assessment did not identify this issue. The SAN Self-Assessment identified this issue.

FINDING MF-10 Internal Oversight of National Environmental Policy Act (NEPA) Activities

Finding

The ASNE's FFCTP and SAN do not perform internal independent oversight of their NEPA activities.

Discussion

NEPA compliance is an important element of DOE's ES&H initiative (e.g., SEN-15-90 and DOE 5440.1D). SEN-15-90 directs each Headquarters Program Office and Operations Office to designate a NEPA Compliance Officer (NCO) to coordinate, assist, and generally oversee compliance activities. SAN responded to this mandate by designating the Director of the OIIO as the SAN NCO. In his role as NCO, the Director has established a review process which provides the Manager, SAN with an independent review of individual NEPA activities conducted by SAN divisions. However, NCO activities are not independently reviewed since the reviewer, the Director of OIIO, is also the NCO.

A similar problem exists in the ASNE's FFCTP, the line management organization responsible for ETEC. Since the ASNE's NCO also serves as the FFCTP environmental compliance officer, NE does not provide independent oversight of NEPA activities for FFCTP activities.

Environmental Subteam Findings (see NEPA/CF-1 through NEPA/CF-3) highlight the need for an effective, independent NEPA oversight program. For example the Environmental Subteam found "Rockwell's, the Site Office's, SAN's and the Program Office's NEPA implementing procedures are either lacking or are not consistent with DOE NEPA requirements" (see NEPA/CF-1).

Self-Assessment

The SAN Self-Assessment recognized that this issue was a management finding of the recent LBL Tiger Team Assessment.

FINDING MF-11 Inconsistent SAN ES&H Directives

Finding

SAN transmittal of environment, safety, and health directives (Orders, SENs, and other Secretarial level letters) is not consistent, is not always timely and generally does not provide site-specific guidance, or lead to a common understanding with the Site Contractor.

Discussion

The DOE directive system is one of the primary mechanisms for communicating DOE requirements to the Site Contractor, including those for ES&H. It provides an opportunity for DOE and the Site Contractor to convey their respective expectations regarding implementation, which leads to a clear and common understanding.

Past SAN practices in distributing directives were not consistent in that differing elements of SAN would send directives to various elements of the Site Contractor organization (with the exception of SENs which are consistently sent by the Manager, SAN to the ETEC General Manager). In general, the transmittals provided only a statement regarding applicability to the Site Contractor and a SAN contact for further information. These transmittals gave little to no site specific guidance on how these directives were to be implemented, did not require implementation plans except where specifically required by the directive, and generally took two to three months to reach the Site Contractor.

On April 3, 1990, SAN revised its directive management system SAN MD 1321.1B. While this revision procedurally corrects the distribution problems and does provide for implementation guidance, it does not require Site Contractor acknowledgement of receipt, response regarding impact, or implementation plans. In addition, a review of the ETEC correspondence control system indicates that, to some extent, the distribution problem persists in that some directives were sent by the SAN Contracting Officer, as stated in SAN MD 1321.1B, and some were sent by the ETEC Site Representative. The review also indicates that little site-specific implementation guidance is being provided. Therefore, there is no assurance that the Site Contractor has received all applicable directives and the opportunity to ensure common understanding of requirements and expectations.

In order to establish a common baseline, the Site Contractor on February 8, 1991, sent a letter to the SAN Acting Site Manager listing the DOE Orders (but no SENs) which it considered to be contractually binding. The letter acknowledges the requirement to comply with all DOE ES&H Orders, and requests "that all Orders which DOE feels require ETEC action be transmitted by the DOE Contracting Officer to the Rocketdyne Contracts Administrator." Furthermore, the letter indicates that the Site Contractor will review and respond to SAN on all future Orders received and will not "accept the Order" until this response is acknowledged by SAN. Implementation of this process should correct the cited problems and ensure common understanding.

Self-Assessment

Only the distributional aspect of this finding was identified in the SAN Self-Assessment, while the ETEC Self-Assessment identified all aspects of this finding.

FINDING MF-12 Responsibility for SSFL Buildings

Finding

DOE has not clearly delineated its ES&H responsibilities for DOE-owned buildings and facilities at SSFL, nor developed a plan which addresses disposal and/or cleanup of such buildings and facilities.

Discussion

The prime contract between DOE and Rockwell International for the management and operation of ETEC (Contract No. DE-AC03-76SF00700) specifically identifies the buildings and facilities that are covered by its contractual terms and conditions. There is no provision in the contract for the Site Contractor to involve itself in any of the other DOE-owned buildings and facilities which exist at SSFL. These other buildings and facilities have the potential for significant current and future ES&H impact. In most instances, their ownership is known, but they were covered by contracts, grants, and leases that have expired without any arrangements made for disposal and cleanup or continuing ES&H responsibility. (Some current contracts address disposal and cleanup, e.g., SSFL Hot Cell and RMDF).

In some instances, ownership is not clear (e.g., DOE, other Federal agencies, Rockwell). Even where ownership of buildings and facilities is clearly in DOE, it is not certain who the "Landlord" is in whom responsibility is placed for planning, directing, and funding for maintenance or disposal and cleanup.

SAN has not maintained a current and accurate Real Property Information System (RPIS) listing of DOE real property assets at the SSFL site. As a result, multiple lists of buildings and facilities at the SSFL site exist. These lists contain inconsistencies, omissions and inaccuracies. Nor has SAN developed a master plan for dealing with these buildings and facilities.

This issue has been known to DOE (both Headquarters and SAN) and the Site Contractor for some time. However, little action has been taken to date.

Self-Assessment

This issue is addressed in the SAN Self-Assessment. Minor treatment is given to this issue in the ETEC Self-Assessment.

5.6 NOTEWORTHY PRACTICES

There were no noteworthy practices identified by the Management Subteam.

5.7 TEAM COMPOSITION AND AREAS OF RESPONSIBILITY

Area of Responsibility	Name/Organization
Management Subteam Leader	Scott Hinschberger U.S. Department of Energy, Idaho Operations Office
Management Assessment	Robert Compton Nuclear Power Consultants, Inc.
Management Assessment	Marvin J. Laster, Esq. Private Consultant
Management Assessment	William J. Musick U.S. Department of Energy, Office of Energy Research
Management Assessment	Louis A. Rancitelli Battelle
Management Assessment	David Schweller DBS Associates, Inc.

EVALUATION OF ETEC AND SAN SELF-ASSESSMENT REPORTS AND PROGRAMS

6.0 EVALUATION OF ETEC AND SAN SELF-ASSESSMENT REPORTS AND PROGRAMS

On January 26, 1990, the Secretary of Energy issued a directive that all line management organizations institute a formalized Self-Assessment program. On July 31, 1990, the Secretary also issued guidance on the conduct of self-assessments. Included in that guidance was direction to Tiger Teams to evaluate and compare findings of facility Self-Assessments with the findings and concerns identified by each Tiger Team.

In addition to comparing findings, the Tiger Team evaluated the methods used by ETEC and SAN to develop their Self-Assessment reports. The methods were evaluated in terms of management involvement and attention, participation of personnel at all levels, extent of use of Site Contractor support, and QA checks employed.

The Secretary's guidance identified the following eleven elements as being necessary to a successful self-assessment program:

1. Formal program charter
2. Comprehensive scope
3. Defined schedules
4. Assessment criteria and procedures
5. Formal tracking systems
6. Root cause analysis
7. Formal system for carrying out corrective actions
8. Formal process to identify trends and mechanisms to communicate root causes and lessons learned
9. Formal training for personnel with assessment responsibilities
10. Cooperation with external oversight and assessment organizations
11. Line management-fostered atmosphere of continual self-evaluation and quality improvement

An institutionalized self-assessment program can be characterized as having systematically addressed these elements as well as having continuing resources and management commitment to support their implementation.

The Tiger Team used these elements, along with the performance objectives and criteria provided in the July 31, 1990, memorandum, as the basis for evaluating the ETEC and SAN Self-Assessment reports and programs.

6.1 SUMMARY OF EVALUATION RESULTS

Summaries of the Tiger Team's evaluation of the ETEC and SAN Self-Assessment reports and programs are contained in this section. Subsequent sections contain more detailed descriptions of the evaluation results.

6.1.1 ETEC Self-Assessment

Performance Objective

DOE facilities are to institute formal self-assessment programs (January 26, 1990, Secretary of Energy Directive and July 31, 1990, implementing guidance).

FINDING SA-1 ETEC Self-Assessment Program

The Site Contractor's self-assessment program is not yet institutionalized, but the process used generally reflects the elements of an effective Self-Assessment program.

Discussion

The Site Contractor's Self-Assessment process is not documented by a standard operating procedure. However, process which Rocketdyne management used to perform the ETEC Self-Assessment is briefly described in Section 2.11.2 of the report as "a review of all activities for compliance with applicable regulations, permit requirements, DOE Orders, and company policies and procedures." The process apparently involved all line management, including the ETEC General Manager, who chaired a Management Committee composed of all middle and staff managers, and other support personnel. The discussion states that the Management Committee met three times a week to assess progress and raise new issues and action items, and maintained a punch list of internal and external assessment issues (i.e., management and organization, environmental, safety and health, Self-Assessment process, independent appraisal, and pre-Tiger Team activities).

Rocketdyne used a "Red Team/Blue Team" concept to quality assure their Self-Assessment activities. The Red Team, composed of Rocketdyne technical specialists independent of ETEC support responsibility, provided peer review of internal "Blue Team" inspections. All results were reported to the Vice President/Division Director, and to the President of Rocketdyne.

As described, the process to track findings and corrective actions appears adequate. The stated intent of the Site Contractor is to continue with correction of punch list items, using a Master Action Item List which indicates whether a corrective action plan is required, shows whether the plan has been prepared, and indicates if the item is open or complete. The reporting and tracking system includes monthly responses from facility managers. ETEC QA is responsible for updating the list, publishing a monthly summary report, and reporting missed milestones to the General Manager for action. The quarterly report to SAN will report status of all open items.

The report states that the Site Contractor intends to continue the self-assessment process as additional audit reports are prepared internally or received from the DOE or other organizations external to the Site Contractor; however, no established schedule is provided. The Site Contractor's commitment to perform "assessments of compliance to requirements ... at a minimum, every three years unless otherwise indicated by performance in a given area", and a statement that "the first assessment will be performed early in 1992" implies that, contrary to the Secretary's guidance, ETEC plans to do a complete Self-Assessment every 3 years. Future self-assessments should not be attempted for the entire facility in all functional areas at one time as was necessary in anticipation of the Tiger Team visit. The self-assessment should not be an entirely new audit process; it more accurately should be characterized as a plan for more effective use of existing DOE internal and external appraisal programs. The significance of the 3-year interval is to provide for evaluation of portions of the facility in all functional disciplines at least once every three years as comprehensive input for the triennial management appraisals under DOE 3790.1A and 5482.1B. A schedule for future internal appraisal activities should therefore be developed around existing DOE requirements.

It is not clear from the report whether any mechanism beyond tracking is anticipated for assuring closure on findings and corrective actions. The procedures prepared to document the self-assessment program at ETEC should include identification of responsibilities and performance appraisal criteria to address the need for ownership of followup in this area. It is also not clear whether the Site Contractor intends to continue the Red Team mechanism for QA of future appraisal activities.

The ETEC Self-Assessment acknowledged the root cause analysis (see Chapter 3.0) as the most critical part of the Self-Assessment process. The root cause analysis went beyond a strict compliance audit, to provide a complete diagnostic assessment. The methodology involved an analysis of 15 most revealing events involving DOE-funded programs within the last 2 years, corroborated by an evaluation of a statistical sampling (37/1000) of findings identified in the Self-Assessment. While the Self-Assessment guidance does not specify the particular analytical approach which should be used to identify causal factors and develop root causes, a system which only takes a close look at 5 percent of the findings is suspect. However, the ETEC Self-Assessment did identify corrective actions to address the root causes, not merely symptoms.

The ETEC Self-Assessment identified some of the deficiencies in their self-assessment program. The SAN assessment of the ETEC self-assessment identified others.

FINDING SA-2 ETEC Self-Assessment Appraisal and Report

The failure of ETEC to follow standard audit practice in conducting the self assessment resulted in identification of less than half of the Tiger Team findings and concerns.

Discussion

The ETEC appraisal was a decent first effort. It included line-management and ES&H/QA support staff at all levels of the contractor organization, from operating levels up to and including the President.

The scope of the ETEC Self-Assessment was fairly comprehensive - addressing most relevant disciplines for all ETEC facilities and operations. The report organization, and therefore the audit, could be improved by following the list of "areas of inquiry" in the Secretary's July 31, 1990, Self-Assessment Guidance. The use of the TSA OA criteria for the Management section is too restrictive, and does not give adequate attention to the environmental aspects of management required for a comprehensive self-assessment report. Omission of areas such as auxiliary systems, technical support, and experimental activities from the TSA section, as well as combination/de-emphasis of several disciplines (personnel protection, medical services, occupational safety and worker safety compliance, and industrial hygiene) should be avoided. While this may be a site-specific adaptation of the guidance based upon a determination by the Site Contractor that some areas were not significant for this facility, this is not apparent from the document.

The ETEC Self-Assessment report is a concise summary discussion of results of pre-Tiger Team inspections and recent internal appraisals, and includes not only deficiencies, but descriptions for every area of inquiry investigated. Conclusions, summaries, and corrective actions are discussed at the end of each section. Copies of surveys, recent routine functional and technical appraisals, and more detailed descriptions of findings and recommendations are referenced and attached in Volume II. For some areas of inquiry, the discussion is limited to a reference to Volume II for the actual appraisal report (deficiencies) and punch list (corrective actions).

The ETEC Self-Assessment report tended to read somewhat defensively, and the Management Subteam noted that it concentrates more on the paper/management aspects of ES&H than the implementation of ES&H. This is evidenced by the greater success the Site Contractor had in identifying management and organization findings reported by the Tiger Team than findings and concerns in the technical areas.

The report concludes that the primary root causes, by frequency of finding occurrence, were: (1) lack of "ownership" (supervision) of the ES&H responsibility by managers (i.e. inadequate supervision), and (2) lack of assessment and oversight of ETEC operations. Inadequate resources, delay in communicating and implementing goals and objectives, and past lack of ES&H policy were also cited less frequently as root causes. Corrective actions proposed include changes to ETEC procedures, increased communication of ES&H priorities, increased ES&H matrix support, strengthening of the independent audit process, changing funding priorities, reassignment of responsibilities, and augmentation of ETEC's performance indicator system. Rocketdyne audit procedures have been revised, and a formal training program for audit personnel proposed. Formal training of personnel involved in root cause analysis is included in ETEC's Plan of Action (Section 2.8.3.6) for compliance with DOE Self-Assessment requirements.

However, the success of the self-assessment process must be based upon the summary of the comparison of Tiger Team findings and concerns vs. those identified by the Site Contractor; this comparison is presented in Table 6.1-1. A more detailed evaluation of the ETEC Self-Assessment and report, from the perspective of each of the three Tiger Team organizational components, is provided in Section 6.2, including a finding-by-finding comparison of ETEC and Tiger Team results.

The ETEC Self-Assessment fully identified this finding. The SAN Self-Assessment of the ETEC Self-Assessment partially identified this finding.

TABLE 6.1-1
Summary of ETEC Finding Comparison

Subteam	No of Findings	Identified		Partially		Not Ident.	
Env.	39	6	(15%)	11	(28%)	22	(56%)
S&H	133	43	(32%)	6	(4%)	84	(63%)
M&O	7	3	(43%)	3	(43%)	1	(14%)
SA	2	1	(50%)	1	(50%)	0	(0%)
Total	181	53	(29%)	21	(12%)	107	(59%)

6.1.2 SAN Self-Assessment

Performance Objective

DOE organizations are to institute comprehensive ES&H/QA self-assessment programs which build upon existing internal appraisals. The self-assessment program is to be a formal process, that clearly defines roles and responsibilities, scope and schedule, and provides for root cause analysis and corrective action identification and implementation. (January 26, 1990, Secretary of Energy Directive and July 31, 1990, implementing guidance).

FINDING SA-3 SAN Self-Assessment Program

The SAN Self-Assessment process is undergoing institutionalization, but at this time does not demonstrate major elements of a comprehensive self-assessment program.

Discussion

Through an iterative process driven by Tiger Team Assessments of SAN government-owned, contractor-operated (GOCO) facilities, the SAN self-sssessment program is approaching compliance with the Secretary's elements of an effective self-assessment program. The "charter" for the self-assessment process is currently a draft SAN Management Directive (MD): ENVIRONMENT, SAFETY, HEALTH AND QUALITY ASSURANCE SELF-ASSESSMENT PROGRAM, which was circulated in October for use in preparation of the SAN Self-Assessment in anticipation of the LBL Tiger Team Assessment. It was revised in January based upon the results of the LBL Self-Assessment, and the revised draft was available during the revision of the SAN Self-Assessment in anticipation of the ETEC Tiger Team. It expected to be issued in final form before the SLAC Tiger Team Assessment. It should, of course, be submitted to the appropriate PSO(s) for review and approval.

The goals, responsibilities, and requirements set forth in the MD are generally consistent with the Secretary's guidance, and the Self-Assessment process envisioned by the draft SAN MD appears to include most of the elements of the Secretary's self-assessment program. However, SAN has yet to implement the majority of them. The draft MD delegates the following eight elements to various SAN organizational units:

1. Self-assessment schedules
2. Performance criteria and procedures
3. Formal tracking systems
4. Root cause and trend analysis
5. Formal system for carrying out corrective actions
6. Incorporation of lessons learned into daily operations and planning
7. Formal training for personnel with assessment responsibilities
8. Cooperation with external oversight and assessment organizations

All but the last two elements are included in the most recent version of the draft MD as the responsibilities of the SAN ES&H/QA Self-Assessment Program Manager. The duties of the Program Manager include development of the self-assessment program; development of a system for tracking, root cause analysis, trending, and incorporation of lessons learned into daily operations and planning; development of formal systems to assure that corrective actions are completed and validated; and issuance of the final SAN MD for the self-assessment program. The Self-Assessment plan which the SA Program Manager is responsible for preparing under his designation by memorandum dated March 14, 1991, is to include "scope, requirements, performance criteria and schedules for Self-Assessments." Interviews with SAN management reveal that the evolving process will ultimately include a roll-up of division Self-Assessments by each Assistant Manager, further rolled-up into the SAN Self-Assessment report by the Self-Assessment Program Manager (and the active involvement of the Assistant Managers, although this "matrix" effort is not yet specified in the draft MD). Furthermore, the SAN process involves: (1) oversight of all self-assessment components by SAN Office of Internal Independent Oversight (OIIO); (2) integration of routine audits and appraisals; and (3) assessment of self-assessment programs of the four GOCO facilities, with spot-checks of contractor findings. This process, when implemented, should satisfy the Secretary's requirement for standard operating procedures for conducting internal appraisals, assessments, and surveillances (including development of lines of inquiry and use of checklists and other resources), and for documenting, integrating, communicating, and tracking results. However, at this time, neither Section 7 of the draft MD (although titled PROCEDURES), nor the attachment to the March 14, 1991, delegation memo (although it contains a heading titled "the SAN SA process"), includes a flowchart or description of such a stepwise integrated process. Therefore, current documentation provides no record of an established, well-defined, comprehensive, and integrated self-assessment process.

Section II.C of the report (author unknown) acknowledges that SAN self-assessment process deficiencies include inadequate integration of contractor, SAN and Headquarter elements in the process. The role of

NE, partially defined by the SAN/NE Management Agreement, provides for NE performance of TSAs, trending of appraisal and audit results and corrective actions, and conduct of periodic management reviews. The trending is to be supported by SAN safety, QA, and environmental compliance reporting to NE. This lack of integration should be corrected by actions taken to remedy another acknowledged deficiency in the SAN self-assessment process: the lack of a feedback loop to SAN management for tracking action items. Formal training and cooperation with external overseers must also be addressed.

The SAN Self-Assessment partially identified the deficiencies in their program.

FINDING SA-4 SAN Self-Assessment Appraisal and Report

The uneven content, non-uniform structure, and lack of integration in the SAN Self-Assessment report limit its effectiveness as a management instrument.

Discussion

SAN performed a Self-Assessment in December 1990, in anticipation of the LBL Tiger Team Assessment. The Self-Assessment was "modified" and expanded in March 1991, in preparation for the ETEC Tiger Team Assessment, and will undergo further revision in July 1991, prior to the initiation of the Tiger Team Assessment for SLAC. The Self-Assessment is expressly "intended to be the basis for SAN's ongoing, institutional Self-Assessment process."

The Self-Assessment report was reviewed as the indication of whether the Self-Assessment program, as implemented meets the Secretary's requirements. The review focussed on those components of the report which related to line management of ETEC:

- Two functional Self-Assessments (NEPA and QA)
- Three support division Self-Assessments (ESS, EFM, OIIO)
- The line management Self-Assessment of the Nuclear Energy Division
- The Self-Assessment of SAN EM activities at ETEC
- The root cause analysis.

The report did not include a self-assessment of the ETEC Site Office, which was not in existence, nor of the Assistant Manager for Energy Programs (which will not be prepared until all self-assessments for his division have been completed).

The report as it exists at this time does not clarify how the SAN Self-Assessment program will ensure that ES&H deficiencies are identified, reported, and corrected, and how such information will be tracked. In addition to the Self-Assessments listed above, the report includes:

- a SAN <u>assessment</u> of ETEC

- a SAN <u>assessment</u> of the ETEC Self-Assessment.

However, the SAN assessment of ETEC is admittedly a "spot check", based upon "SAN oversight activities, audits, appraisals, award fee evaluations, and site walk-throughs", and not based upon comprehensive inspections. There is also no evidence that the ETEC Self-Assessment findings and concerns were integrated into the SAN reporting and corrective action system. The comprehensiveness of ongoing SAN oversight activities, therefore, can be inferred from the finding comparisons in Table 6.1-2, below. Also, SAN's validation review of the ETEC Self-Assessment only uncovered a minimal number of ES&H/QA deficiencies that ETEC did not identify.

The format set forth in Section 7.b. of the draft MD envisions a much more integrated document, with primary organization based on management, safety and health/QA, and environment areas, with the corresponding hierarchy of disciplines. The SAN report does not follow this format, although the draft MD has been in existence through the LBL and ETEC revisions. Because SAN intends ultimately to include <u>all</u> SAN Self-Assessment documentation for all four M&O contractors in one report, for tracking and trending purposes, the SAN Self-Assessment report will remain a fragmented compilation of individual organizational and functional Self-Assessments until the completion and integration of the full range of organizational Self-Assessments. This also means that individual Self-Assessment reports will not be prepared for each GOCO site. It is intended that the final assimilation by the Assistant Manager for Self-Assessment into the report format specified in the draft MD will transform this document into a comprehensive analysis of SAN ES&H/QA activities. Integration and cross-walking of Self-Assessment activities by the involved SAN management units is needed to convert the report into an effective management instrument.

The lack of integration apparent in the SAN Self-Assessment report was identified by the LBL Tiger Team. Although a section which identifies and discusses key findings and root causes was added to the ETEC portion of the SAN self-assessment in response to the LBL Tiger Team Assessment report, this attempt at a rollup was a temporary, superficial effort to accommodate the Tiger Team schedule, and amounts to little more than an executive summary. The failure of this document as a cohesive summary that permits the reader to see the logic trail leading to the key findings and root causes forces the reader to look at all sections of the report or accept the analysis given in the Root Cause Analysis Section I.C.

With respect to the content of the individual self-assessment components of the current "interim" report, each is complete to the extent that it contains findings, root causes, and corrective actions; but each follows a non-standard format, and few identify performance objectives criteria and causal factors or provide <u>analyses</u> of key findings and root causes. While the analysis of individual inspectors are provided in the dated memos included in Section VI of the self-assessment report, the organizational self-assessments do not reference them, or demonstrate that they were conducted by "qualified personnel not directly responsible for performance of the activity being assessed" (See S-1 Guidance on ES&H Self-Assessment, July 31, 1990).

The schedule of annual management and functional assessments in the OIIO Policy and Procedure indicates that OIIO will provide independent oversight of the process. However, at this time, the report includes only OIIO assessment of line management (AMEP). There has been no assessment of support organizations such as ESS and EFM, and no quality verification check of the effectiveness of the Self-Assessment process. A line management assessment of ERWM by OIIO was also absent.

With respect to the effectiveness of the process and the report in identifying deficiencies, a summary of the comparison of Tiger Team findings and concerns versus the findings of SAN are presented in Tables 6.1-2 and 6.1-3.

The SAN self-assessment identified deficiencies in the process as it has been implemented to date.

TABLE 6.1-2
Summary of SAN Finding Comparison
(Total Findings*)

Subteam	No of Findings	Identified		Partially		Not Ident.	
Env.	39	6	(15%)	8	(20%)	25	(64%)
S&H	138	4	(3%)	31	(22%)	103	(75%)
M&O	12	6	(46%)	5	(42%)	1	(8%)
SA	4	0	(0%)	4	(100%)	0	(0%)
Total	193	16	(8%)	48	(25%)	129	(67%)

* Since the SAN Self-Assessment included a SAN assessment of ETEC, based on two dozen SAN appraisal reports, performed during 1991 the depth of that review.

TABLE 6.1-3
Summary of SAN Finding Comparison
(Findings Attributed to SAN*)

Subteam	No of Findings	Identified		Partially		Not Ident.	
Env.	10	3	(30%)	3	(30%)	4	(40%)
S&H	8	2	(25%)	0	(0%)	6	(75%)
M&O	6	4	(67%)	2	(33%)	0	(0%)
SA	2	0	(0%)	2	(100%)	0	(%)
Total	26	9	(35%)	7	(27%)	10	(38%)

* Does not include findings and concerns which indicate ETEC noncompliance with mandatory requirements, policies and standards, and therefore implicate SAN oversight and enforcement deficiencies.

6.2 COMPARISON OF TIGER TEAM AND SELF-ASSESSMENT FINDINGS

The following discussion provides a rough indication of the success of the SAN and ETEC self-assessment reports in identifying deficiencies which Subteams later identified as findings or concerns. The comparisons of findings for the SAN self-assessment are provided in two ways: the first is based upon a review of the "SAN Assessment of ETEC" included in the self-assessment report and provides an indication of the effectiveness of SAN technical and functional appraisals in identifying M&O, Environmental and S&H deficiencies; the second way is based upon a review of the self-assessments performed by individual SAN organizations, and provides an indication of the success of those organizations in identifying these findings which indicated a SAN deficiency <u>other</u> <u>than</u> lack of oversight (which arguably is a causal factor for any finding levied against ETEC.

6.2.1 <u>Environmental Subteam Comparison of Findings</u>

The Environmental Subteam reviewed the ETEC Self-Assessment report and the SAN Self-Assessment report. A summary of the comparison of Subteam findings with ETEC Self-Assessment results is provided in Table 6.1-1, and a comparison with SAN Self-Assessment results is provided in Tables 6.1-2 and 6.1-3. Table 6.2-1 presents a finding-by-finding comparison of the Environmental Subteam findings with the self-assessment results.

6.2.1.1 ETEC Finding Comparison

The Environmental Subteam identified a total of 39 findings: 22 compliance findings, and 17 best management findings. Of these findings, 6 were fully identified in the ETEC Self-Assessment report and an additional 11 findings were partially identified, for a total of 17. This indicates that ETEC's Self-Assessment identified, to some degree, 44 percent of the findings. A total of 22 environment findings were not identified during the course of the ETEC Self-Assessment.

The ETEC Self-Assessment was judged by the Subteam as not particularly effective in anticipating Tiger Team findings in any of the 10 technical disciplines the Subteam reviewed, although it did partially identify all 3 air findings, and at least partially identified both toxic materials findings. No more than 50 percent success was noted in the other areas.

6.2.1.2 SAN Finding Comparison

The Environmental Subteam identified a total of 39 findings: 22 compliance findings, and 17 best management findings. Of these findings, 6 were fully identified in the SAN Self-Assessment report and an additional 8 findings were partially identified, for a total of 14. This indicates that SAN's Self-Assessment identified, to some degree, 36 percent of the findings. A total of 25 environmental findings were not identified during the course of the SAN Self-Assessment.

Ten of the 39 findings addressed inadequate SAN resource allotment, or deficiencies in plans or programs required by DOE Orders, and can be attributed specifically to SAN. Of the 10, the SAN Self-Assessment fully addressed 5 (50%), and partially addressed 2 (20%), for a total of 7 (70%).

The SAN Self-Assessment was judged by the Subteam as not particularly effective in anticipating Tiger Team findings in any of the ten general areas this Subteam reviewed, although it demonstrated some success in each of the areas.

6.2.2 Safety and Health Subteam Comparison of Findings

The Safety and Health Subteam reviewed the ETEC Self-Assessment report and the SAN Self-Assessment report. A summary of the comparison of Subteam concerns with ETEC Self-Assessment results is provided in Table 6.1-1, and a comparison with SAN Self-Assessment results is provided in

Tables 6.1-2 and 6.1-3. Table 6.2-2 presents a concern-by-concern comparison of the Safety and Health Subteam concerns with the Self-Assessment results.

6.2.2.1 ETEC Concern Comparison

Of the 138 concerns identified by the Safety and Health Subteam, 133 (96%) were assigned to ETEC or jointly to ETEC and SAN. A total of 43 concerns (32%) were fully identified in the ETEC Self-Assessment report and an additional 6 (4%) concerns were partially identified, for a total of 49. One of the SAN concerns was also identified. This indicates that ETEC's Self-Assessment identified, to some degree, almost 37 percent of the concerns.

Of the 133 concerns assigned to ETEC, 3 were assigned a Category II seriousness level; none were assigned a Category I level. The Safety and Health Subteam found that ETEC fully identified both of the electrical Category II concerns but not the Category II concern.

Seventy-seven (58%) of the 133 concerns assigned to ETEC or jointly to SAN and ETEC were assigned a C1 compliance level indicating noncompliance with mandatory DOE requirements, prescribed policies and standards, or documented accepted practice. The remainder of the concerns assigned to ETEC or jointly to SAN and ETEC, were at the C2 compliance level, indicating noncompliance with recommended DOE references, standards, guidance, or good practice. No concerns were given a C3 compliance rating, indicating little or no compliance considerations. The ETEC Self-Assessment identified fully identified 25 (32%) and partially identified 3 (4%) of the concerns which the Subteam identified at the C1 compliance level, or 36 percent, virtually the same level of success demonstrated by their overall identification record.

Of the concerns assessed against ETEC, 22 (17%) were assigned a H1 hazard level, indicating a potential for causing a severe injury or fatality, potentially fatal occupational illness, or loss of facility. A total of concerns 87 (65%) were at the H2 level, indicating the concern has the potential for causing minor injury, minor occupational illness, major property damage, or has the potential for resulting in or contributing to unnecessary exposure to radiation or toxic substance. Twenty-four concerns (18%) were judged to be H3 hazard level which has little potential for threatening safety, health, or property. The ETEC Self-Assessment fully identified 9 and partially identified none of the H1 concerns, for a better than overall 45 percent. The ETEC Self-Assessment fully identified 27 (29%) and partially identified 5 (4%), or, again, a little more than one-third of the H2 concerns.

As indicated above, the ETEC Self-Assessment identified, on average, 33 percent of the Tiger Teams concerns. Of the 17 general areas this Subteam reviewed, the ETEC Self-Assessment was particularly effective in fire protection (100 percent of concerns identified), Site/Facility Safety Review, (100%), and, to a lesser extent, Radiological Protection (50%).

The general areas where the self-assessment compared least favorably to the Subteam concerns are:

- Auxiliary Systems , where none of the three compliance concerns was identified;

- Security/Safety Interface, where none of the two concerns was identified.

(See Table 4-1 for additional information.)

6.2.2.2 . SAN Concern Comparison

Of the 138 concerns identified by the Safety and Health Subteam, 5 were assigned to SAN alone, all addressing inadequate SAN guidance and oversight, and three were assessed jointly against SAN and ETEC. The SAN Self-Assessment fully identified 2 of these, or 25 percent.

The portion of the SAN Self-Assessment addressing functional and technical appraisals of ETEC was confined to 8 concerns on two pages of summary. A total of 4 concerns (3%) were fully identified in the SAN Self-Assessment report and an additional 31 concerns were partially identified, for a total of 35. This indicates that SAN's Self-Assessment identified, to some degree, 25 percent of the concerns.

Of the 138 concerns identified by the Tiger Team, 3 were assigned a Category II seriousness level; none were assigned a Category I level. The Safety and Health Subteam found that SAN partially identified two of the Category II concerns. The 8 concerns attributed solely or jointly to SAN were all Category III level concerns.

Eighty-two (59%) of the concerns were assigned a C1 compliance level indicating noncompliance with mandatory DOE requirements, prescribed policies and standards, or documented accepted practice. The remainder of the concerns were at the C2 compliance level, indicating noncompliance with recommended DOE references, standards, guidance, or good practice. None of the concerns were given a C3 compliance rating, indicating little or no compliance considerations. The SAN Self-Assessment fully identified 3 (4%) and partially identified 23 (28%) of the concerns which the Subteam identified at the C1 compliance level, as well as 10 (18%) of the concerns identified as C2.

Of the concerns identified by the Tiger Team, 23 (17%) were assigned a H1 hazard level, indicating a potential for causing a severe injury or fatality, potentially fatal occupational illness, or loss of facility. A total of 91 (66%) concerns were at the H2 level, indicating the concern has the potential for causing minor injury, minor occupational illness, major property damage, or has the potential for resulting in or contributing to unnecessary exposure to radiation or toxic substance. Twenty-four concerns (17%) were judged to be H3 hazard level which has little potential for threatening safety, health, or property. The SAN Self-Assessment fully identified none, but partially identified 6 (26%) of the H1 concerns. SAN fully or partially identified 23 (25%) of the H2 concerns.

Of the 17 general areas this Subteam reviewed, the SAN Self-Assessment was particularly effective in anticipating the deficiencies the Tiger Team reported in the areas of emergency preparedness, site/facility safety review, and personnel protection. The general areas where the Self-Assessment compared least favorably to the Subteam concerns are:

- Organization and Administration, where only 1 of 14 concerns was identified
- Operations, where none of the five concerns was identified
- Training and Certification, where only 1 of 10 concerns was identified
- Technical Support, where only 1 of 10 concerns was identified
- Radiological Protection, where of the 11 concerns, none was identified, including the 1 addressing the SAN audit function
- Fire Protection, where none of the 10 compliance concerns was identified.

6.2.3 Management Subteam Comparison of Findings

The Management Subteam reviewed the ETEC Self-Assessment report and the SAN Self-Assessment report. A summary of the comparison of Subteam findings with ETEC Self-Assessment results is provided in Table 6.1-1, and a comparison with SAN Self-Assessment results is provided in Tables 6.1-2 and 6.1-3. Table 6.2-3 presents a finding-by-finding comparison of the Management Subteam findings with the Self-Assessment results. There was also a NEPA finding which identified partial NE responsibility.

6.2.3.1 ETEC Finding Comparison

The Management Subteam identified a total of six findings which applied to the Site Contractor, and MF-7 (Work for Others) which applied to both the Site Contractor and SAN. Of these findings, three were fully identified in the ETEC Self-Assessment report and an additional three findings were partially identified, for a total of six. This indicates that ETEC's Self-Assessment identified, to some degree, 86 percent of the Management Subteam findings attributed to it. The Site Contractor also identified two of the DOE findings: MF-11 (Directives System) and MF-13 (Management of non-ETEC DOE-owned Buildings).

6.2.3.2 SAN Finding Comparison

The Management Subteam identified a total of 12 findings. Of these findings, 6 were fully identified in the SAN Self-Assessment report and an additional 5 findings were partially identified, for a total of 11. This indicates that SAN's Self-Assessment identified, to some degree, all but one of the Management Subteam's findings. However, the omitted finding is very significant. This omitted finding was that ETEC does not have an effective independent oversight system, which is a significant omission considering SAN's oversight of ETEC.

Six findings, or half, were attributed to SAN, including one attributed jointly to SAN and the Site Contractor. Of these, the SAN Self-Assessment fully identified four, and partially identified two.

TABLE 6.2-1
Self-Assessment Summary
Environmental Finding Comparison

Finding Number	Short Title	SAN	ETEC
A/CF-1	Inadequate Stack Emissions Monitoring Methods for Radioactive Particulates	N	P
A/CF-2	Inadequate Meteorological Data	N	P
A/BMPF-1	Inadequate Characterization of Radioactive Particulates	P	P
SSB/BMPF-1	Inadequate Physical Control of the Former Sodium Disposal	N	N
SSB/BMFPF-2	Inadequate Soil and Sediment Monitoring From the Northwest Area	N	N
SW/BMPF-1	Spill Control Practices and Procedures	N	F
SW/BMPF-2	Inadequacies in the Rockwell SPCC and FSCP	N	N
SW/BMPF-3	Program For Monitoring Drinking Water	N	N
W/BMPF-4	Maintenance of Sanitary Sewers	N	N
GW/CF-1	Lack of a Groundwater Protection Management Plan and a Groundwater Monitoring Plan	F	F

TABLE 6.2-1

Environmental Finding Comparison

Finding Number	Short Title	SAN	ETEC
GW/CF-2	Incomplete Hydrogeologic Assessment Report (HAR) for B-886	N	N
GW/BMPF-1	Inadequate Characterization of Hydrogeologic Regime	P	P
GW/BMPF-2	Inadequate Monitoring Well Security, Maintenance, Labeling, Inventory, Abandonment, and Construction	N	P
GW/BMPF-3	Incomplete Decontamination of Groundwater Sampling Equipment	N	N
GW/BMPF-4	No Organic Vapor Monitoring During Groundwater Sampling	N	N
WM/CF-1	Inadequate Waste Minimization Program	F	F
WM/CF-2	Storage of Land Disposal Restricted (LDR) Mixed Waste	N	N
WM/BMPF-1	Lack of Verification of Hazardous Waste Characterization	P	P
WM/BMPF-2	Lack of Characterization of Sanitary Wastewater Treatment Plant Sludge	N	N

TABLE 6.2-1

Environmental Finding Comparison

Finding Number	Short Title	SAN	ETEC
TCM/CF-1	Incomplete Hazard Identification	P	P
TCM/BMPF-1	Storage of Incompatible Chemicals	F	F
QA/CF-1	Deficient Quality Control Of Vendor Analytical Laboratories	N	N
QA/CF-2	Conflict of Interest Between Site Contractor QA/QC Coordinator and Environmental Analytical Lab Manager	N	N
QA/CF-3	Handling of Corrections to Data and Records Archiving	N	N
QA/CF-4	Lack of a Pollution Prevention Awareness Plan	P	P
QA/BMPF-1	Inadequate Environmental Monitoring Program	F	F
QA/BMPF-2	Lack of an Approved Environmental Protection Implementation Plan	F	F
RAD/CF-1	AIRDOS-PC Modeling Deficiencies	N	N
RAD/CF-2	Lack of Supporting Data to Eliminate Routine Environmental Surveillance	N	N
RAD/CF-3	No Contingency Plan for Transuranic Waste Storage	N	N

TABLE 6.2-1

Environmental Finding Comparison

Finding Number	Short Title	SAN	ETEC
RAD/BMPF-1	No Consistent Contamination Surveys on Packages	N	N
IWS/CF-1	Inadequate Waste Site Program	P	N
IWS/CF-2	Hazardous Materials Business Plan Reporting Inadequacies	P	P
IWS/CF-3	Inadequate Waste Site Program	N	N
NEPA/CF-1	Lack of Adequate and Integrated NEPA Procedures	N	N
NEPA/CF-2	Inadequate NEPA reviews and Milestones for the Budget Review Process	N	N
NEPA/CF-3	Lacking and Inappropriate NEPA Determinations	P	P
NEPA/CF-4	Incomplete NEPA Recordkeeping and Tracking	F	P
NEPA/CF-5	Inadequate NEPA Review of Proposed Actions	N	N

F = Fully Covered
P = Partially Covered
N = Not Covered
N* = Not covered but aware

TABLE 6.2-2
Self-Assessment Summary
Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
OA 1-1	Job Desc/Safety Resp	N	F
OA 1-2	Safety Mtgs	N	N
OA 1-3	ETEC Not Proactive	N	N
OA 2-1	Line Safety vs Overv	N	N
OA 3-1	Safety Goals	N	N
OA 4-1	Interface of Respon	N	N
OA 5-1	Perform Indicators	N	F
OA 5-2	Lack of SAN Oversight	F	N
OA 6-1	Annual Perf Eval	N	F
OA 7-1	Docs Uncontroled	N	N
OA 7-2	Updating of ETEC Proc	N	F
OA 7-3	Mgmt not enforc Proced	N	N
OA 8-1	Trng/Substance Abuse	N	N
OA 8-2	Drug Screen Inconsis	N	N
QV 1-1	Need QA Plan	P	N
QV 1-2	Stop Work Auth	N	F
QV 1-3	ID Long/Sht Term Trnds	N	F
QV 1-4	Need Specific Proced	N	F
QV 1-5	Quality Audits	N	F

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N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
QV 1-6	Corrective Action	P	F
QV 1-7	Procedure Detail	N	F
QV 1-8	Mgmt to Req Conform	P	F
QV 1-9	Maint of Record Stor	N	N
QV 1-10	Insufficient QV Prog	N	N
QV 2-1	Unapproved Matl Source	P	N
QV 3-1	Receipt Inspections	N	N
QV 4-1	Calibration Verif	N	N
QV 5-1	Material Control	N	F
QV 5-2	Knowledge Rptg Def	N	N
QV 5-3	Stor & Control of Matl	N	N
QV 5-4	Preven of Degridation	N	N
QV 6-1	Limited Insp Prog	N	N
QV 6-2	Untrained Inspectors	N	F
QV 7-1	Personnel Certifica	N	N
QV 7-2	Process Mat'l Not Cont	N	N
OP 1-1	Safety Aware Program	N	N
OP 2	See TS 2-1	N	F
OP 3-1	Review of Oper Proc	N	N

F = Fully Covered
P = Partially Covered
N = Not Covered
N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
OP 4-1	Imple Lock & Tag Prog	N	P
OP 5-1	Coord ETEC & Rocketdyn	N	N
OP 6-1	Shift Ldr/Opr Training	N	F
MA 1-1	Doc Maint Plan	P	F
MA 1-2	Maint Org Structure	N	F
MA 1-3	Prev Maint Effective	N	F
MA 1-4	Deferred Maint/OPNS	N	N
MA 2-1	Maint Deficiencies	N	N
MA 3-1	SCTI Maint Sub Std	N	N
MA 4-1	No Guid/Input from DOE	F	N
MA 4-2	Planning & Scheduling	N	N
MA 5-1	Not Success/Reduce Hzd	N	F
MA 5-2	Ineffective/Upkeep	N	N
MA 6-1	Inproper Test Proced	P	F
MA 6-2	Prevt. Maint	N	N
MA 6-3	Tagout Lockout Proced	P	N
MA 7-1	Predictive Maint	N	N
MA 8-1	Maint Proc/Control	N	N
		N	N

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N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
TC 1-1	No Trng & Qualif Prog	P	N
TC 3-1	Effective Training	N	F
TC 4-1	Trng Cert/No Exams	N	N
TC 4-2	Trng to Recog. Hazards	N	N
TC 5-1	No Maint Trng & Qualif	N	N
TC 7-1	No Trng Supt FAC	N	N
TC 8-1	No Trng for Inspectors	N	F
TC 9-1	No RAD Protect Trng	N	F
TC 10-1	Mgmt Trng on Safety	N	F
AX 1-1	No ID for SCTI AX	N	N
AX 3	See MA 5-1	N	N
AX 5-1	Control/Haz Air Efflu	N	N
AX 6	See MA 6-2	N	N
AX	See MA 6-2 & TS 2-1	N	N
EP 1-1	No Formal EP Organ	P	N
EP 1-2	No SAN Oversight EP1-1	N	N

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N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
EP 2-1	Emerg Plan Proc	P	F
EP 2-2	No Guidance from SAN	N	N
EP 3-1	Doc EP Trng Program	P	N
EP 4-1	No EP/Drill Program	P	N
EP 5-1	Resources for Emer Res	P	N
EP 6-1	No EP for Notifica	P	N
EP 7-1	Pers Prot On/Off Site	P	F
TS 1	See OA 1-1 Def Respon	N	F
TS 2-1	OSRs not in place	N	F
TS 2-2	Determine Safety Doc	N	N
TS 2-3	SARs & SADs not compl	N	F
TS 2-4	Address Sig Safe Iss	N	N
TS 3-1	Val of Safety Calc	N	N
TS 3-2	ETEC Dir/Codes & Stand	N	N
TS 3-3	ETEC using Unapp Devia	N	N
TS 4-1	No Trend of Perf Data	F	F
TS 5-1	Contam Air Filtering	N	N
TS 5-2	Sampling Practices	N	N
SS 2-1	Emer Ingress/Egress	N	N

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N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
SS 4-1	Firearm Safety Control	N	N
EA	See TS 2-1 No OSRs	N	F
FR 1-1	Safety Rev Committee	F	F
FR 4-1	No Periodic ES&H Row	P	F
FR 5-1	Triennial Mgmt Appra	P	F
RP 1-1	Mgmt Oversight/Aware	N	N
RP 2-1	Int Audit/Ind Oversite	N	N
RP 2-2	No SAN Audit	N	N
RP 3-1	No Proced for Rad Prot	N	P
RP 4-1	Exter Exposure Proc	N	N
RP 5-1	Conduct/Ext Rad Dos	N	F
RP 5-2	Policy/Dir Read Dos	N	N
RP 6-1	Air Sampling Perfm	N	F
RP 7-1	Internal Exposure Doc	N	F
RP 10-1	Contamination Control	N	F
RP 11-1	ALARA Mgmt Support	N	N

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N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
PP 1-1	O&A/Line Mgmt Control	P	N
PP 1-2	No Oversight by HS&E	P	P
PP 2-1	QC of ES&H Monitoring	P	N
PP 2-2	S&H Procedures not Acc	P	N
XRef PP1-2,	PP3-3, PP4-2 & PP5-2	N	N
PP 3-1	Coord/Mgmt & S&H	P	P
PP 3-2	Mgmt of Asbestos Contr	P	N
PP 3-3	Dsgn/Hzd Areas/No Cont	N	N
PP 4-1	QV2-1 Impl Enf Saf Com	P	P
PP 4-2	No ID of Hzd/Monitor	P	P
PP 5-1	Hazard Communication	P	N
PP 5-2	Hazard Info Syst	P	N
PP:/TC	Training for PP TC1-1/4-2	N	N
WS 3	See PP 5-1	N	N
WS 3-1	PP 4-2/Warning of Hzd	N	N
WS 4-1	Means of Egress	P	F
WS 4-2	Safety Equip Inoper	N	N
WS 4-3	Machine Guards	N	N

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N* = Not Covered but Aware

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
WS 4-4 *	Electrical Hazards	P	F
WS 4-5 *	(See WS 4-4) Elec Com	N	F
WS 4-6	Load Ratings not Post	N	N
WS 4-7	PP 4-2 Slings & Rigg	P	F
WS 4-8	Compressed Gas Use	N	N
WS 4-9	Hand Tool Use/Repair	N	F
WS 4-10	OSHA Violations App F	N	N
WS 5-1	Contof Subcont Safety	N	N
WS 5-2	Subcont Elec Comp	N	N
WS 5-3	Welding & Cutting	N	N
FP 2-1	NFPA 101 Compliance	N	F
FP 6-1	Physical Fitness/F.F.	N	F
FP 6-2	San Distr DOE Order	N	N
FP 6-3	STAFF Level NFPA 1500	N	F
FP 6-4	Training Program	N	F
FP 6-5	F.D. No Safety Officer	N	F
MS 1-1	O&A Involvement	N	N
MS 2-1	Documentation Incomp	N	N
MS 3-1	Med Fac. Inappro	N	N
MS 3-2	Med Staff Insufficient	N	F

F = Fully Covered
P = Partially Covered
N = Not Covered
N* = Not Covered but Aware
* = Cat. II

TABLE 6.2-2

Health and Safety Concern Comparison

Finding Number	Short Title	SAN	ETEC
MS 3-3	No Physical Exam	N	F
MS 4-1	No Audit Program	N	N

F = Fully Covered
P = Partially Covered
N = Not Covered
N* = Not Covered but Aware

TABLE 6.2-3
Self-Assessment Summary
Management and Organization Finding Comparison

Finding Number	Short Title	SAN	ETEC
MF-1	Strategic Planning	F	F
MF-2	Organizational Roles	F	F
MF-3	Individual Roles & Training	P	F
MF-4	Contractor Indep. Oversight	N	P
MF-5	Perf. Monit. & Asst.	P	P
MF-6	Conduct of Operation	P	P
MF-7	Work-For-Others	P	N
MF-8	DOE Oversight	F	N
MF-9	CPAF Process	F	N
MF-10	NEPA Oversight	SAN-F NE-N	N
MF-11	Directive System	P	F
MF-12	SSFL Bldg. & Fac.	F	F

F = Fully Covered
P = Partially Covered
N = Not Covered

SPECIAL ISSUES

7.0 SPECIAL ISSUES

In addition to the Tiger Team Assessment of ETEC as directed by the Secretary and as defined in Section 1.0 of this report, the Tiger Team took this opportunity to conduct an investigation to identify and evaluate DOE activities associated with historic and current activities performed by Rockwell, under other contracts or grants to DOE, or its predecessor agencies, at Rockwell's Downey, Canoga Park, and DeSoto facilities. These three facilities, which are owned by Rockwell, are all located outside the boundaries of the SSFL site; thus they are being treated as special issues, rather than included in the main body of this report.

The Environmental Subteam reviewed all three facilities. The Safety and Health Subteam reviewed the only facility that houses current activities for DOE, the DeSoto Bldg. T104 Mass Spectrometer Laboratory.

Special Issues focus on broad environmental issues that cross DOE program and site lines and effect overall environmental compliance and environmental management effectiveness. Special Issues are not findings, but are topics or situations requiring further evaluation based on the matter or set of circumstances surrounding the issue.

7.1 SPECIAL ISSUES - ENVIRONMENT

7.1.1 Downey

DOE-funded activities were performed by Rockwell's Atomics International Division in a small portion of a large building at the Downey, California facility between 1948 and 1955. DOE activities included mainly paper studies, research and development, and engineering studies. However, DOE activities also involved the use of a 2 MeV Van de Graff generator, a small scale radiochemical laboratory, a neutron counting room, and a construction area where a small (1/2-watt) teaching reactor was constructed. The reactor fuel was uranyl sulfate which used a sealed polonium and beryllium neutron source; only very small quantities of radioactive material were ever present at the facility. This small teaching reactor operated until it was moved to the SSFL in 1955. A total of three curies of radioactive material was present when the reactor was at full power.

Because the small radionuclide sources were sealed, radionuclide contamination associated with the facility is very unlikely. However, the chemical laboratory, which discharged wastewater into a common sanitary sewer line, may have discharged small quantities of organic solvents into the sanitary drainlines, although there are no records of this occurring. Sewer lines used for disposal of wastewaters were, and may still be, connected to the public municipal system. No records are available on any D&D activities associated with the drain lines; however, a radiological survey was conducted within the facility after the reactor was moved to the SSFL, and no radioactive contamination from the DOE operations was detected.

There are no current DOE activities associated with the Downey facility.

7.1.2 Canoga Park

DOE-funded activities at Rockwell's Canoga Park, California facility were conducted by Rockwell personnel in the Vanowen Building from approximately 1954 through 1960. The activities involved the construction of 10-watt aqueous homogeneous reactors for use in training institutions. Reactor fueling occurred only after the reactors were installed at the training institutions. A few fuel elements for the organic moderated reactor were also fabricated at this facility.

Facilities where DOE-funded work took place within the Vanowen Building included the machine shop (where some beryllium machining took place), a radio-chemical laboratory, and office space. The waste water from all facilities, except the laboratory, discharged into a common sanitary sewer line which went to the municipal sewage treatment plant. The waste water from the radio-chemical laboratory went to a clarifier, where it was tested for radioactivity before being released to the sanitary sewer if it was found to be below established standards. The sludge from the clarifier, which was considered low-level radioactively contaminated, was disposed of in a government repository, or at an Atomic Energy Commission disposal site for low-level waste.

Once the DOE work was completed, the clarifier 1) was surveyed for radioactivity, 2) determined to be within acceptable standards, and 3) backfilled. The transfer lines from the clarifier to the sewer main may still exist, although, if so, they are not in use. There have never been any chemical analyses conducted on the soils surrounding the clarifier or the sewerlines connecting the clarifier to the sanitary sewer.

There are no currently DOE-funded production, manufacturing, or laboratory activities associated with the Canoga Park facility.

7.1.3 DeSoto

DOE and its predecessor agency activities were conducted at the DeSoto facility under Atomics International and its predecessor organization, Rockwell International. The activities included engineering design, construction, nuclear fuel fabrication, and a radiochemistry laboratory. The facilities were used for DOE activities until 1988. Chemical releases from facilities operations, if any, would have been discharged through the sanitary sewer lines. With the exception of the transfer lines used to discharge very low levels of radioactive effluents (less than one percent of the maximum permissible concentration (MPC)) to the sewer, as discussed below, there has been no chemical characterization of the soils underlying the sewer lines to determine whether areas of chemical contamination exist.

The DOE DeSoto facilities which contained radioactive material were the nuclear fuel fabrication facility (Bldg. 101) and a radiochemistry laboratory (Bldg. 104). The fuel fabrication facility, which used about twenty percent of the space within Bldg. 101, was made up of offices, manufacturing and supply areas, and a quality assurance laboratory. The facility was used to produce uranium/aluminum fuel elements for test reactors. Some of the work involved developing uranium/aluminum alloys which, because of the uranium, was done in sealed gloveboxes.

Former sewage lines connecting sinks and showers at Bldg. T101 were plumbed into a network that discharged into a pair of 1,500-gallon steel "hold-up" tanks. The purpose of these tanks was to allow sufficient time for sampling and analysis of the sanitary water prior to discharge to the main municipal sewer line. If the concentration of radionuclides was below the MPC, the water was released to the municipal sewer, and if above, was transported to the RMDF facility on the SSFL for evaporation. However, no water collected in the hold-up tanks was ever above the MPC. During decommissioning of the facility in the 1980's, radioactive contamination of the small areas of soils adjacent to some of the drain lines was determined to be slightly above acceptable limits. Approximately 10 of a total of 140 soil samples had activities in the range of 50 to 80 pCi/gm, compared to the NRC established limit of 48 Pci/gm. Decommissioning and decontamination of the facility included the removal of the hold-up tanks and excavation of contaminated soil. The outflow lines, which extend from the hold-up tanks to the main sewer line between Bldgs. 101 and 104, remain in place.

Building 104 of the Desoto facility, which was used for DOE activities, housed the radio-chemistry laboratory, offices, and a small operating training reactor. Wastewater from the laboratory was discharged into the municipal sewer lines. During discharge, samples were proportionally collected and analyzed for radioactivity. The results were reportedly always below regulatory limits. The facilities have been decontaminated and decommissioned, and the facility is now used for other Rockwell purposes.

Within Bldg. 104 there is a Mass Spectrometer Laboratory, which is currently funded under Grant No. DE-FG03-89ER52163 from DOE. This grant is a standard DOE grant and contains no safety and health clause. The mass spectrometer equipment is government-owned, but the Laboratory building is owned by and under the control of Rockwell. As a result of the ongoing DOE activity, the Laboratory was inspected by the Environmental Subteam for potential deficiencies with respect to Federal, State of California, or DOE environmental regulations and requirements.

The Mass Spectrometer Laboratory is used for the analysis of miniature specimens of nonfissile metals irradiated in DOE and international reactors. Operations of the DeSoto Mass Spectrometer Laboratory generate very small quantities of radioactive, hazardous, and mixed waste, including radioactive solvents, solvent wipes, and acids. Observed deficiencies include:

- Small quantities of acids contaminated with low-levels of radioactivity were being improperly treated through evaporation in a chemical exhaust hood. The Mass Spectrometer Laboratory does not have the necessary hazardous waste treatment permit under Federal and State of California regulations. The Site Contractor has now reported that this evaporation has been halted.

- Small quantities of radioactive waste containing hazardous solvent wipes were being placed into a metal container and managed as a radioactive waste, which is not in accordance with DOE orders and the Resource Conservation and Recovery Act (RCRA). The practice has reportedly been stopped.

- Since the Laboratory mixed wastes were unknowingly being considered as only radioactively-contaminated wastes, the wastes were not being inspected as required by Federal and State of California hazardous waste regulations.

7.2 SPECIAL ISSUES - SAFETY AND HEALTH

On March 25, 1991, the Worker Safety appraisers from the Safety and Health Subteam conducted a safety review of the Mass Spectrometer Laboratory, located at the Rocketdyne DeSoto Facility Bldg. 104. The purpose of the review was to evaluate whether the Laboratory was providing a safe and healthy workplace for Rockwell employees. The Subteam walked through the workplace, examined equipment, spoke with employees, and assessed the infrastructure. Each Subteam member was accompanied by a contractor representative. Where a violation of OSHA regulations was observed, it was immediately pointed out to the contractor representative, who, in many cases, was able to initiate corrective action.

There were approximately 25 to 30 violations of OSHA and DOE workplace safety and health standards and regulations identified during the review. None of the violations could be classified as an "imminent danger", defined as a situation in which there was a high probability that death or serious harm would occur to an employee. Many of the violations, however, did meet the OSHA criteria for the "serious" category, in that there existed a possibility, although unlikely, of death or serious harm.

By far, the most common violations related to Subpart S of 29 CFR 1910 (electrical safety regulations). Such violations included inadequate ground fault circuit interrupter (GFCI) protection next to sinks, lack of dead fronts for plugs on extension and electrical power tool cords, and blocked electrical circuit breaker control boxes.

The second most common violation concerned the standards in Subpart Z of 29 CFR 1910 (toxic and hazardous substances), and chiefly involved deficiencies in the hazards communication program. Particularly, material safety data sheets (MSDS) containing descriptions of the properties of substances were not always freely available to employees exposed to those substances, and some chemicals were improperly labeled as to their reactivity, health risk, and flammability. Also, the Laboratory had no Chemical Hygiene Plan.

Further violations were noted for Subpart O of 29 CFR 1910 (machinery and machine guarding), related to hazards to employees such as those created by point of operations, ingoing nip points, rotating points, and flying chips. There was also a lack of guarding for horizontal and vertical belts and a lack of guarding to preclude employee exposure to rotating points/belts.

These hazards should have been recognized by the employees and supervisors in the affected workplace. That they were not suggests inadequate training in hazard recognition and awareness. The Mass Spectrometer Laboratory needs to take a hard look at its operation from the standpoint of compliance with 29 CFR 1910, so that the safety and health of its employees can be ensured.

Corrective action should be taken on each of the identified deficiencies.

APPENDICES

APPENDIX A

ASSESSMENT TEAM PERSONNEL AND BIOGRAPHICAL SKETCHES

APPENDIX A-1

Biographical Sketches of
Tiger Team Assessment Leader
and Team Leader Staff
Energy Technology Engineering Center

Team Leader and Staff

Paul K. Kearns
Vicki L. Prouty
Christine J. Grady
Mary Meadows
Robert F. McCallum

ETEC TIGER TEAM ORGANIZATION

Paul Kearns
Tiger Team Leader
Vicki Prouty
Deputy Team Leader
Christine Grady
Assistant

George Detsis
OSP Coordinator
Angela Foster
Legal Advisor
Mary Meadows
Administrator

Richard Serbu
EH Senior Manager

Joseph Boda
Environmental Subteam Leader
William Eckroade
Assistant Subteam Leader
Emile Boulos
Assistant Subteam Leader

Scott Hinschberger
Management Subteam Leader

Al Morrongiello
Safety & Health Subteam Leader
Doug Abramson
Assistant Subteam Leader

<u>SAN SUPPORT</u>

Robert Le Chevalier
Charles Simkins
Gary Lavagnino
Walt Von Flue
Susan Brechbill

<u>ETEC SUPPORT</u>

Clark Gibbs	Don Zweng
Steve Lafflam	Majelle Jensen
Paul Olson	Bruce Pilling
Bill DeBear	Manny Tessier
Dave Darley	Carol Wayment

<u>NE SUPPORT</u>

John Semko

Energy Technology Engineering Center

Figure A-1

NAME: Paul K. Kearns

AREA OF RESP: Tiger Team Leader

ASSOCIATION: U.S. Department of Energy, Solar Energy Research Institute Site Office, Area Manager

EXPERIENCE: 12 years

- Area Manager, SERI Area Office. Administers the prime contract for the management and operation on the Solar Energy Research Institute, Provides on-site DOE management and oversight of all contractor operations, including institutional planning and management, research and development, technology transfer, environmental protection, health and safety, security, and engineering and construction activities.

- Senior Program Manager for Repository Technology Transportation Division, High-Level Nuclear Waste Program. Responsible for state and public interactions, risk assessment, economic analysis, program integration, systems analysis, and providing direction and oversight of contractor activities.

- Deputy Manager, Crystalline Repository Project. Responsible for management of all project activities including repository siting and licensing, technology development institutional relations, contractor oversight, and planning and budget development.

- Site Evaluation Branch Chief, Crystalline Repository Project. Responsible for repository siting and regulatory activities, strategic planning, public interactions, and contractor oversight.

- Health Protection Specialist, Operational and Environmental Safety Division. Responsible for implementing environmental and radiological safety requirements on DOE research programs and at several government facilities, conducting of appraisals of government-owned contractor-operated National Labortories, and obtaining environmental permits and licenses for DOE facilities.

EDUCATION: Ph.D., Health Sciences, Purdue University
M.S., Bionucleonics, Purdue University
B.S., Environmental Sciences, Purdue University

NAME: Vicki L. Prouty

AREA OF RESP: Deputy Tiger Team Leader

ASSOCIATION: U.S. Department of Energy, Chicago Operations Office, Office of Chief Counsel, Argonne, Illinois

EXPERIENCE: 11 years

- Provides general environmental legal support to the U-AVLIS Project, the Solar Energy Research Institute Office, the Batavia (Fermilab) Area Office, and to CH matrix organizations in the areas of air, water, toxics, OSHA, and NEPA compliance.

- Participated in development of Siting Guidelines for high-level waste geologic repositories.

- Assisted in preparation of Environmental Assessments for the Salt Repository Project, and the Regulatory Compliance Plan for the proposed Texas nuclear waste repository site.

- Participated in development of Screening Methodology Document and the Regulatory Compliance Plan for the Crystalline Repository Project.

- Assisted in revision of the SSC Draft Environmental Impact Statement, and in preparation of the Comment Response Document.

- Participated in the negotiation of the Rocky Flats CERCLA Interagency Agreement.

EDUCATION: J.D., University of Cincinnati College of Law, 1980
Master's level courses in Zoology, University of Miami, 1974-1975
B.S., Biology, University of Cincinnati, 1973

NAME: Christine J. Grady

AREA OF RESP: Administrative Assistant to Tiger Team Leader and Deputy

ASSOCIATION: U. S. Department of Energy, Chicago Operations Office

EXPERIENCE: 9 years

- Personnel Staffing Specialist/ Training and Development Coordinator, Federal Personnel Branch
- Personnel Assistant, Federal Personnel Branch
- Secretary, Federal Personnel Branch
- Area Manager's Secretary, Argonne Area Office

EDUCATION: Pursuing A.A., Business Management, Joliet Junior College, to be completed in December 1991

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, Office of Safety Appraisals: Participates in the overall planning and conducting Tiger Team Assessments, Technical Safety Appraisals, Management Appraisals, Nuclear Safety Program Appraisals, Design Reviews, and Comprehensive Appraisals since 1981. Responsible for the overall production of draft reports in the field and final publication of reports at DOE Headquarters. Responsible for providing coordination and editorial support on all DOE Appraisals.

  - Staff Assistant, Office of Environmental Compliance and Overview. Recommended specific changes in administrative procedures for the purpose of increasing efficiency, elimination unnecessary details, or providing needed management control.

  - Staff Assistant, Office of Bio-Medical and Environmental Research, USAEC, ERDA. Obtained and conveyed information with organizations and individuals outside/inside the Agency which required knowledge in 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 included Administrative and conference planning responsibilities within the USAEC, ERDA, and DOE.

EDUCATION: Numerous work-related courses and workshops at various colleges, training centers, and American Management Association

OTHER: Member, U.S. Delegation of Disarmament Conference, Geneva, Switzerland. Recipient of Federal Government Awards for superior performance.

NAME: Robert F. McCallum

AREA OF RESP: Report Technical Manager

ASSOCIATION: Packer Engineering, Inc.

EXPERIENCE: 13 years

- 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.
- Battelle Memorial Institute
  - Responsible for coordinating site selection, institutional, and regulatory compliance support to DOE as part of basic technology development 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.
  - Coordinated development of responses to public comments on multidisciplinary Environmental Impact Statement for Management of Commercially Generated Radioactive Waste.
  - 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

APPENDIX A-2

Biographical Sketches of Environmental Subteam Members
Energy Technology Engineering Center

Environmental Subteam Leader and Members

Joseph Boda
Emile I. Boulos
William A. Eckroade
John Thomas Fitch
Scot A. Foster
Richard D. Hall
Gregory T. Haugan, Jr.
Cynthia G. Heckman
Richard B. Lynch
Christopher B. Martel
John J. Pulliam, III
Raeann Reid
Lorene L. Sigal
James I. Stevens
Joseph Swiniarski
Alex Teimouri
John A. Wood

NAME: Joseph Boda

AREA OF RESP: Environmental Subteam Leader

ASSOCIATION: U.S. Department Energy, Office of Environmental Audit

EXPERIENCE: 21 years

- Environmental Engineer. Principal responsibilities include leading multi-disciplinary teams of professionals in performing environmental surveys, assessments, and audits. Acted as Assistant Team Leader for three Environmental Surveys (Mound Plant, Pantex Plant, Los Alamos National Laboratory) and Team Leader for seven Environmental Surveys (Argonne National Laboratory, Idaho National Engineering Laboratory, Component Development and Integration Facility, Solar Energy Research Institute). Also served as the Environmental Subteam Leader for the Pantex Plant, Brookhaven National Laboratory, and the Oak Ridge National Laboratory Tiger Team Assessments, and Team Leader of the Bonneville Power Administration, Lower Columbia Area, Environmental Audit.

- Prior experience in the environmental field includes environmental research, development of environmental assessments and impact statements, and management of hazardous and toxic materials and waste under RCRA and TSCA. Also managed operations for a U.S. Air Force installation and major U.S. waterways and reservoirs for environmental issues, including endangered species, cultural and natural resources preservation, surface water, groundwater protection, and waste management.

EDUCATION: M.S., Sanitary Engineering, Oregon State University
B.S.,Soil and Water Science, University of California, Davis

NAME: Emile I. Boulos

AREA OF RESP: Assistant Environmental Subteam Leader

ASSOCIATION: U.S. Department of Energy, Office of Special Projects

EXPERIENCE: 20 years

- Physical Scientist, Tiger Team Assessment Program
- Participated in Tiger Team Assessment of ETEC, Canoga Park, CA. Key areas of responsibility include: Air, Radiation, QA/QC, and Self-Assessment
- Prepared Environmental Performance Objectives for Air and Quality Assurance.

• U.S. Environmental Protection Agency (USEPA), Office of Emergency and Remedial Response

- Project Manager, Superfund, Contract Laboratory Program Managed contracts concerning the development, implementation, and operation of Contract Laboratory Program in support of Superfund Enforcement and other EPA Programs. (30 Laboratories, $45 million dollar contracts).
- Planned, directed, and managed a major national project for characterization of air toxics at Superfund Sites.

• State Medical Examiner, New Jersey.

• Chase Pharmaceutical Co., New Jersey. Analytical Chemist.

EDUCATION: M.S., Chemistry, New Jersey Institute of Technology.
B.S., Chemistry and Physics, Cairo University, Egypt.

NAME: William A. Eckroade

AREA OF RESP: Assistant Environmental Subteam Leader

ASSOCIATION: U.S. Department of Energy, Office of Environmental Audit

EXPERIENCE: 4 years

- Environmental Engineer under the direction of the Audit Team Leader/Environmental Subteam Leader, provides guidance, direction and assistance to a multidisciplined group of professionals performing Environmental Audits and Tiger Team Assessments at DOE facilities.
- Served as the Assistant Team Leader for the Maywood, New Jersey Environmental Audit, and ETEC Tiger Team Assessment.

- U.S. Department of Energy, Office of Environmental Compliance
  - Environmental Engineer responsible for conducting independent oversight of Environmental Compliance activities at the Savannah River Site.
- U.S. Environmental Protection Agency, Office of Waste Programs Enforcement
  - Environmental Engineer responsible for providing assistance in technical case development to assigned EPA regional offices. Additionally, responsible for conducting oversight of regional activities involving all Superfund activities at enforcement lead sites.

EDUCATION: M.S., Civil Engineering, University of Maryland
B.S., Geophysics, Virginia Polytechnic Institute

NAME: John Thomas Fitch

AREA OF RESP: Inactive Waste Sites

ASSOCIATION: Arthur D. Little

EXPERIENCE: 14 years

- Actively involved in Arthur D. Little's environmental risk assessment services, including the evaluation of environmental/financial liabilities associated with active and inactive operating facilities. The activities include remedial investigation/feasibility studies.

- Environmental auditing activities while supervising the Waste Management, Inc., Corporate Auditing Program involving the review and assessment of compliance activities at active and inactive hazardous waste sites. Compliance reviews included CERCLA, RCRA, and other environmental programs.

- Investigation and enforcement activities related to hazardous waste management facilities while working for the Indiana RCRA program. Involved in RCRA and CERCLA litigation involving hazardous waste management sites.

EDUCATION: B.S., Environmental Health Sciences, Indiana University

NAME: Scot A. Foster

AREA OF RESP: Groundwater

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 12 years

- Served as technical specialist for auditing and assessment of groundwater issues at numerous industrial facilities including petrochemical processing plants, refineries, and mines.
- Served as project manager for a U.S. Environmental Protection Agency Superfund site with responsibilities for groundwater investigation program design, technical evaluation of data, and report preparation.
- Conducted studies for the U.S. Environmental Protection Agency, Office of Radiation Programs focusing on performance assessment of proposed DOE geologic repositories for radioactive waste in Yucca Mountain and WIPP. Groundwater modeling of radionuclide release and transport was conducted for multiple release scenarios. Carbon-14 transport in unsaturated tuff at Yucca MT. was investigated and modeled in detail with projections of population and dose exposures.

EDUCATION: M.S., Geology, University of Idaho
B.S., Geology, University of Maine

NAME: Richard D. Hall

AREA OF RESP: Waste Management

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 10 years

- Developed and implemented environmental management programs at over 20 operating locations. Programs encompass all regulatory requirements including air, water, spills, CERCLA, and hazardous waste management.

- Developed and implemented annual audits at each operating location to determine environmental compliance and conformance with best management practice.

- Performed site assessments at operating locations for preparing for acquisition and divestment activities. In addition, Mr. Hall has participated in activities at CERCLA sites negotiating settlement terms and remedial investigations and onsite activities.

EDUCATION: B.S., Electrical Engineering, Massachusetts Institute of Technology

NAME: Gregory T. Haugan, Jr.

AREA OF RESP: Environment Report Administration

ASSOCIATION: META

EXPERIENCE: 8 Years

- Information Management Specialist. Manages a team responsible for onsite administrative support for the Environmental Subteam during Tiger Team Assessments. Efforts to date include Brookhaven, Sandia National Laboratory - Livermore, Hanford Site, Argonne Illinois Site, Oak Ridge National Laboratory, Lawrence Berkeley Laboratory, and Princeton Plasma Physics Laboratory.

- UDI Contractors, Inc.
  - Project Manager and Administrator. Supervised field operations and managed office administration for a construction management firm.

- GLH, Inc.
  - Program Analyst. Specialized in research, report writing, and project management software for an information resources management consulting firm.

EDUCATION: B.A., General Studies, University of Maryland

NAME: Cynthia G. Heckman

AREA OF RESP: National Environmental Policy Act (NEPA)

ASSOCIATION: Oak Ridge National Laboratory (ORNL)/Martin Marietta Energy Systems, Inc.

EXPERIENCE: 6 years

- Participated in Tiger Team Assessments of the Rocky Flats, FMPC/Fernald, Pantex, Kansas City, Savannah River, Lawrence Livermore, Hanford Site, and Argonne National Laboratory facilities to evaluate the adequacy of existing NEPA documentation. Assisted in the development of the NEPA Compliance Audit Protocol used on Tiger Team assessments.

- Technical Information Analyst maintaining and updating the Department of Energy NEPA Memoranda-to-File database and Environmental Guidance Program Reference Books on 14 major environmental statutes including the Resource Conservation and Recovery Act (RCRA); the Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); and the Toxic Substances Control Act (TSCA).

• MAXIMA Corporation

  - Staff Scientist in the Environmental Technology Division providing technical support to Oak Ridge National Laboratory programs by reviewing applicable environmental laws and regulations. Reviewed spill cleanup technologies using foams and other retardants on floating hazardous chemicals for the U.S. Coast Guard.

EDUCATION: M.S., Biology, University of Kentucky
B.A., Biology, Thomas More College

NAME: Richard B. Lynch

AREA OF RESP: Environment Subteam Report Quality

ASSOCIATION: META

EXPERIENCE: 4 years

- Technical Editor/Graphics Specialist. Provides editorial support for the Environmental Subteam during Tiger Team Assessments including text editing, formatting, and graphics production. Efforts to date include Sandia National Laboratory, Livermore, Paducah Gaseous Diffusion Plant, Argonne Illinois Site, Princeton Plasma Physics Laboratory, and the Energy Technology Engineering Center. Also, finalizes draft Tiger Team Assessment reports to provide DOE's Office of Special Projects with the final camera-ready copy..

• 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. Also, wrote press releases and participated in other media outreach activities.

EDUCATION: B.A., General Studies, Louisiana State University

NAME: Christopher B. Martel

AREA OF RESP: Radiation

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 8 years

- Corporate Radiation Safety Officer for Arthur D. Little. Manages all radiation safety activities for the company's Type A Broad Scope License issued by the Nuclear Regulatory Commission. Developed and implemented all programs, training, environmental surveillance, dosimetry, and licensing aspects of the program.

- Project manager for a quantitative radiological hazard assessment for a major phosphate mining operation to evaluate worker exposures from, and environmental releases of, naturally occurring radioactive materials (NORM). Conducted extensive surveys, material sampling, and air sampling. Evaluated handling and disposal procedures of wastes containing high activity concentrations of NORM.

- Performed remedial investigations to quantify environmental levels of a variety of radionuclides on several sites that included research reactors, accelerators, depleted uranium working facilities, and research laboratories.

EDUCATION: M.S., Radiological Physics, University of Lowell
B.S., Environmental Science, University of Lowell

NAME: John J. Pulliam, III

AREA OF RESP: National Environmental Policy Act Subteam Leader

ASSOCIATION: U.S. Department of Energy, Office of NEPA Oversight

EXPERIENCE: 23 years

- Environmental Protection Specialist. Project Review Division and Waste Management Division. Determines required NEPA documentation for DOE projects. Review environmental impact statements and environmental assessments for accuracy and adequacy. Develop NEPA compliance polices 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.

  - Wildlife Biologist. Reviewed and recommended approval of recovery plans for endangered and threatened species in the Office of Endangered Species, Washington, DC. Revised recovery planning procedures. Also, managed the nationwide endangered species land acquisition program.

  - Fishery Biologist/Fish and Wildlife Biologist. Analyzed water resource development projects to determine recommended mitigation for related 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 fish and trout, included disease diagnosis and control. Prepared reports and performed various administrative functions.

EDUCATION: M.S., Biology, University of Southwestern Louisiana
B.S., General Agriculture, New Mexico State University

NAME: Raeann Reid

AREA OF RESP: Environmental Subteam Contractor Coordinator

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 20 years

- Experience participating in leading environmental audits, including multi-disciplinary audits while working at a major petrochemical company where the facilities audited included toll manufacturers, bulk terminals repackaging plants recycles, and commercial disposal facilities, and leading audits and risk assessments for several Arthur D. Little clients, primarily in the refining and petrochemical industries.

- Ten years of experience in hazardous waste management, including 6 years for a major petrochemical manufacturer with responsibility for RCRA training, offsite disposal arrangements, RCRA permitting, and implementation of internal solid and hazardous waste management procedures, groundwater assessments, and RCRA compliance assurance.

- Twenty years of professional experience including industrial and commercial laboratory management, environmental operations, environmental regulatory affairs, industrial and commercial hazardous waste management including site evaluation and remediation and offsite disposal.

EDUCATION: B.S., Mathematics, Minor Chemistry, Texas Technological University

NAME: Lorene L. Sigal

AREA OF RESP: National Environmental Policy Act

ASSOCIATION: Oak Ridge National Laboratory, Martin-Marietta Energy Systems, Inc., Oak Ridge, Tennessee

EXPERIENCE: 11 years

- Provide technical assistance to the U.S. Department of Energy, Office of NEPA Oversight. Developed the draft DOE NEPA Compliance Audit Protocol, and assisted in the development of the DOE NEPA Compliance Guide. Participated as a NEPA specialist at ten Tiger Team Assessments.

- Team Leader. Oak Ridge National Laboratory environmental compliance assessments for the U.S. Air Force under their Environmental Compliance and Management Program.

- Preparation of the DOE Regulatory Compliance Guide for Prevention of Significant Deterioration Under the Clean Air Act.

- Basic research in the effects of air pollutants on vegetation.

- Preparation of terrestrial ecology sections of environmental impact statements (EISs) 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.

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: James I. Stevens

AREA OF RESP: Surface Water

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 48 years

- Served as contractor coordinator for a DOE contract with Savannah River Operations Office to assess the technical and program management aspects of the high level radioactive waste management program.

- Has performed approximately 100 Environmental Assessments over a period of 14 years in a wide variety of industries, concentrating on the technical/regulatory aspects of air, surface water, drinking water, RCRA, CERCLA, and PCBs.

- Has been team leader of environmental assessment teams in the process industries such as prepared paper, chemicals, aerospace, and automotive.

EDUCATION: M.Ch.E., University of Louisville
B.Ch.E., University of Louisville

NAME: Joseph Swiniarski

AREA OF RESP: Quality Assurance

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 29 years

- Evaluated quality assurance capabilities and good laboratory practice compliance for testing laboratories of a major cosmetics company.

- Managed Arthur D. Little's animal laboratories (1984-1989). Responsibilities included assurance of compliance with National Institute Health guidelines and Food and Drug Administration and Commonwealth of Massachusetts regulations; assuring that Arthur D. Little animal facilities meet NTP requirements for a barrier toxicology testing laboratory.

- Experimental Therapeutic and Toxicological scientist with broad experience in laboratory management, radiation biology, and quality assurance monitoring for Arthur D. Little's Chemical and Life Science Section.

EDUCATION: M.A., Biology, Minor in Chemistry, Northeastern University,
B.S., Biology, Minor in Radiation, Boston University

OTHER: AAAS, NY Academy of Science, ALAS, LAMA

NAME: Alex Teimouri

AREA OF RESP: National Environmental Policy Act

ASSOCIATION: U.S. Department of Energy, Office of NEPA Oversight

EXPERIENCE: 5 years

- Environmental Protection Specialist. Review environmental documents for accuracy and adequacy of waste activities projects and responsible for proper integration of RCRA/CERCLA - NEPA processes.

- Federal Highway Administration

  - Community Planner. Analyzed a wide variety of planning and programming issues concerning Federal Highway Administration Projects.

- U.S. Air Force, Edwards AFB, California

  - Long-Range Planner. Coordinated the environmental planning/land use concerns and long range plans with the jurisdictions and regional authorities in the vicinity of the installation and identified mission encroaching impacts.

- U.S. Air Force Systems Command, Andrews AFB, Maryland

  - Community Planner. Assured timely development of long range/comprehensive plans for all command installations. Reviewed and approved facility siting projects for consistency with the environmental factors and plans.

EDUCATION: M.S., Urban and Regional Planning, Eastern Washington University

NAME: John A. Wood

AREA OF RESP: Air

ASSOCIATION: Arthur D. Little, Inc.

EXPERIENCE: 20 years

- Sixteen years experience at the California South Coast Air Quality Management District (SCAQMD) as Principal Chemist. Represented SCAQMD on interagency committees, including Operating Industries and McCall Superfund sites. Developed multiple GC and GC/MS analytical methods. Instructed enforcement personnel in sampling methods.

- Extensive experience dealing with air permitting and compliance issues in California, including part of a Part B permit at a major RCRA hazardous waste facility.

- Served as air expert at a major environmental audit at a 7,000,000 sq. ft. manufacturing facility which included plating, metal working, and coating operations.

EDUCATION: M.A., Physical Chemistry, University of California, Santa Barbara
B.S., Chemistry, University of Southern California

APPENDIX A-3

Biographical Sketches of
Safety and Health Subteam Members
Energy Technology Engineering Center

Safety and Health Subteam Leader and Members

Albert D. Morrongiello
Douglass S. Abramson
J. Kenneth Anderson
George P. Bailey
Rite Bierri
Jimmy E. Biggs
Lorin C. Brinkerhoff
Patricia L. Davidson
Gary J. Gottfried
Pamela L. Gurwell
Jack J. Janda
John H. Johnson
John A. Leonowich
Lewis S. Masson
Leon H. Meyer
William R. Murphy
Anthony Weadock
Bernard S. Zager

NAME: Albert D. Morrongiello

AREA OF RESP: Safety and Health Subteam Leader

ASSOCIATION: DOE Headquarters - Office of Safety Appraisals

EXPERIENCE: 21 years

- U.S. DOE - Team Leader/Assistant Team Leader in Safety Inspection Division
  - Participated in 8 TSAs associated with Tiger Team Appraisals.
- Nuclear Regulatory Commission - Resident Inspector at Quad Cities Power Station
  - Participated on Inspection Teams at various sites.
  - Manned phone station in Emergency Operations Center.
- Environmental Protection Agency - Health Physicist
  - Conducted radium surveys in New York City; responded to public inquiries.
- Research Assistant, Rutgers University, Departments of Zoology and Radiation Science
  - Performed assays, managed animal colony.
- Virginia Institute for Scientific Research
  - Conducted chemical assays of environmental water samples.

EDUCATION: M.S., Biology, University of Richmond
M.S., Professional Management, Florida Institute of Technology
B.A., Chemistry, University of Rhode Island

Additional studies at Rutgers University - Department of Radiation Science
ROTC - Army Reserve
NRC - Boiling Water Reactor School, Pressurized Water Reactor School, Technical Writing, Pre-Supervisory Training

NAME: Douglass S. Abramson

AREA OF RESP: Assistant Safety and Health Subteam Leader

ASSOCIATION: DOE Headquarters - Office of Safety Appraisals

EXPERIENCE: 17 years

- U.S. Department of Energy, Germantown, Maryland
  - Assistant Subteam Leader for Technical Safety Appraisals at DOE facilities.
- U.S. Department of Energy, Washington, D.C.
  - Program Manager and Mechanical Engineer for Test Procedures and Energy Conservation Standards for central air conditioners, room air conditioners, refrigerator/ freezers, humidifiers and dehumidifiers, fluorescent lamp ballasts, and television sets.
- National Institutes of Health, Bethesda, Maryland
  - Team Leader for the design and construction of multi-million dollar renovation and new construction of medical facilities, research facilities, and animal facilities. Project Manager for the construction of the nuclear medicine cyclotron facility.
- U.S. Army Corps of Engineers, United States and Europe
  - Captain, Commander of Engineering Company responsible for all activities including training, maintenance, and safety.

EDUCATION: B.S., Mechanical Engineering, Drexel University
Engineer Office Basic Course and Engineer Officer Advance Course, Fort Belvoir, Virginia
U.S. Army Command and General Staff College, Fort Leavenworth

NAME: J. Kenneth Anderson

AREAS OF RESP: Technical Support/Experimental Activities

ASSOCIATION: Private Consultant

EXPERIENCE: 39 years

- Manager, Safety Assessment Office, Westinghouse Hanford
- Manager, Nuclear Safety, Westinghouse Hanford
- Executive Secretary and Member, Westinghouse, Hanford - Safeguards (Nuclear Facility Safety Review) Council
- Nuclear Facility (reactor and nonreactor) design analysis, operations analysis, and safety analysis at Hanford
- Member of eight DOE-HQ Technical Safety Appraisal Teams
- Member of DOE-NE Reactor Review Team appraising DOE reactor safety following TMI-2 Accident
- Six years of experimental and analytical thermo-hydraulics experience, including primary responsibility for Hanford N Reactor boiling burnout and two-phase pressure drop experimental programs
- Classification Officer, Westinghouse Hanford

EDUCATION: B.A., Physics, University of Utah
Graduate courses in physics, mathematics,and reactor design analysis, University of Idaho

NAME: George P. Bailey

AREA OF RESP: Emergency Preparedness

ASSOCIATION: Advanced Systems Technology, Inc.

EXPERIENCE: 30 years

- Advanced Systems Technology, Inc.
  - Manager, Emergency Preparedness
- Stone & Webster Engineering Corp.
  - Senior Emergency Planning Analyst
- Public Service of Indiana, Marble Hill NGS
  - Senior Emergency Preparedness Licensing Engineer
- Louisiana Power & Light, Waterford 3 SES
  - Site Emergency Planning Coordinator
- Nuclear Energy Services, Inc.
  - Manager, Protective Services

EDUCATION:
University of Philippines
Tunxis Community College
Hartford State Vocational College
NET Course, Sandia Base, New Mexico
Disaster Preparedness Instructor Course
CBR Warfare Instructor Courses
Nuclear Weapons Basic Course
Nuclear Weapons Advance Recertification

OTHER:
AIF - Subcommittee on Siting, Licensing and Emergency Preparedness
AIF - Subcommittee on Safeguards
Society of Fire Protection Engineers

NAME: Jimmy E. Biggs

AREA OF RESP: Fire Protection and Industrial Safety

ASSOCIATION: Biggs Associates

EXPERIENCE: 33 years

- Tarrant County Water Control and Improvement District
    - District Safety Director
- Biggs Associates
    - Private Consultant in fire protection, industrial safety, and accident investigation.
- International Columbia Resources Corporation
    - 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
    - Corporate Technical Advisor, Fire Protection Fire and Fire Prevention
    - Technical Advisor, Fire Protection
- Half Moon Bay Fire Protection District
    - Fire Chief of California Fire Protection District
- Redwood City
    - Fire Inspection and Arson Investigation: Performed safety construction inspections, investigated fires and made recommendations for prevention.

- Naval Supply Center Fire Department
  - Performed building and fire 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
Post Graduate work for Fire Science Program
Advanced Certificate of Fire Service Training
Standard Certificate of Fire Service Training
California State Department of Education Bureau of Industrial Education "Techniques of Teaching"
Standard Design Teaching Credential in Vocational Trade and Technical Teaching in Fire Science - Lifetime Certificate No. VPL 1254 - State of California
City College of San Francisco - Business Administration and Premedical studies

OTHER:

Member, International Association of Fire Chiefs (IAFC)
Member, National Fire Protection Association (NFPSA) - Industrial Section
Member, Veterans of Safety (VOS)
Member, National Safety Council (NSC)
Member, American Society of Industrial Security (ASIS)
Member, World Safety Organization (WSO)
Member, Texan Safety Association (TSA)
Certifications from WSO-CSE, WSO-CSM, WSO-CSS

NAME: Lorin C. Brinkerhoff

AREA OF RESP: Organization and Administration

ASSOCIATION: Private Consultant

EXPERIENCE: 37 years

- Private Consultant associated with Scientech, Inc., ORAU, and EG&G Idaho
- Technical Safety Appraisal Team Leader, DOE Office of Safety Appraisals
- Acting Reactor Safety Branch Chief, DOE Headquarters
- Senior Nuclear Facility Safety Specialist, AEC/ERDA/DOE
- Senior Nuclear Engineer, Aerojet General Corporation, Nerva Program, Nuclear Rocket Development Center, Nevada Test Site
- Manager, Nuclear Critical Facility, Lawrence Livermore National Laboratory
- Reactor Foreman, Phillips Petroleum Co., Idaho Test Site
- Graphite Research Analyst, Hanford, Washington

EDUCATION: B.S., Chemical Engineering, University of Utah

OTHER: Member of ANS-15 Standards Committee on Research Reactor Safety (1980-1989)
Member of ANSI N-16 Standards Committee on Nuclear Criticality Safety (1978-1984)
Listed in: Who's Who in the East and Who's Who in the World

NAME; Patricia L. Davidson

AREA OF RESP: Coordinator/Co-Tiger Team Administrator

ASSOCIATION: U. S. Department of Energy, Headquarters

EXPERIENCE: 18 years

- U. S. Department of Energy
  - Appraisal Specialist, Office of Safety Appraisals. Responsible for Assisting the Tiger Team Administrator with planning and coordination as senior coordinator on DOE Tiger Teams. Responsible for planning, rescheduling, organizing, conducting, and participating in management appraisals, quality assurance appraisals, and Technical Safety Appraisals of DOE Field Offices and operating facilities. Assist with the final production of the technical report following appraisals.
- Oak Ridge Associated Universities
  - Appraisal Coordinator. Provided coordination activities for DOE in Design Reviews, special appraisals, and Technical Safety Appraisals of DOE Field Offices and individual operating contractor facilities. Coordinated pre-appraisal arrangements, such as assistance to TAPSHQA Project Manager in communicating with roster members regarding assignments, schedules, clearances, and reservations with respect to upcoming appraisals. Conducting bibliographic searches for relevant technical material, relevant reports, regulations, and orders.
- AiResearch Manufacturing Company
  - Administrative Engineering Assistant. Coordinated processing of important engineering documents exercising personal responsibility for their accuracy.
- Union Carbide Corporation
  - Data Processor and Reprint/Page Charge Clerk, Oak Ridge National Laboratory.

EDUCATION: Numerous work-related courses. Knoxville Business College. Roane State Community College.

NAME: Gary J. Gottfried

AREA OF RESP: Personnel Protection

ASSOCIATION: Apex Environmental, Inc.

EXPERIENCE: 16 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, occupational exposure assessment and control, health and safety program development/implementation and industrial hygiene surveys; concentration in the petroleum industry, utility, laboratory, and manufacturing sectors.

- Biospherics Incorporated

  - Vice President, Laboratory and Industrial Hygiene Services
    responsible for operations of the Industrial Hygiene and Laboratory Divisions, including program management, business development, protocol development, 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 and managed major hazard and environmental assessments, industrial hygiene surveys, laboratory studies, and health and safety programs; concentration in the petroleum industry, utilities, laboratories, and manufacturing facilities.

EDUCATION: B.S., Chemistry, Purdue University

OTHER:

Certified Industrial Hygienist - Certified in the Comprehensive Practice and Chemical Aspects of Industrial Hygiene by the American Board of Industrial Hygiene, 1982 and 1983
EPA Accredited Asbestos Inspector and Management Planner
Past President, Past Vice President, and Past Treasurer, Potomac Section, AIHA

NAME: Pamela L. Gurwell

AREA OF RESP: Technical Editor

ASSOCIATION: Battelle-Pacific Northwest Laboratories

EXPERIENCE: 8 years

- Supervisor, Technical Communications, manages 16 editors, publications assistants, and text processor
- Editor-in-residence, Materials and Chemical Sciences Center
- Technical editor for DOE Restart Readiness Review of High-Flux Isotope Reactor, Oak Ridge National Laboratory
- Technical editor for DOE Safety Evaluations of N Reactor, PUREX, and Savannah River Reactors
- Lead editor, public comment volume, Hanford Defense Waste Environmental Impact Statement
- Technical editor on Technical Safety Appraisals for Brookhaven National Laboratory, Lawrence Livermore National Laboratory, and Oak Ridge National Laboratory

EDUCATION: M.A., English, University of Virginia
B.A., English, University of Rochester

NAME: Jack J. Janda

AREA OF RESP: Worker Safety

ASSOCIATION: National BioSystems, Inc.

EXPERIENCE: 18 years

- Comprehensive Environmental Health Services, Inc.
    - Safety and health training
    - Asbestos analysis
    - Onsite OSHA-type compliance inspections
    - Safety and industrial hygiene surveys
    - Technical Safety Appraisals
- Occupational Safety and Health Administration (OSHA)
    - Established regional enforcement goals, policies, and procedures
    - Directed industrial hygiene and safety compliance
    - Managed agency programs from enforcement to outreach activities
    - Supervised staff of industrial hygienists and safety specialists
    - Expert witness, Team Leader on major inspections
- Accident Prevention Laboratory, Institute of Agricultural Medicine
    - Accident investigations involving consumer products, flammable clothing and products, etc.

EDUCATION: M.S., Preventative Medicine and Environmental Health - emphasis on Industrial Hygiene, University of Iowa College of Medicine
B.S., General Science, University of Iowa

OTHER: Member, American Industrial Hygiene Association
Member, American Conference of Governmental Industrial Hygienists
Certified by EPA under Asbestos Hazard Emergency Act, Building Inspector and Management Planner
Certified Industrial Hygiene and Safety Instructor by the U.S. Department of Labor (OSHA)

NAME: John H. Johnson

AREA OF RESP: Quality Verification

ASSOCIATION: Private Consultant

EXPERIENCE: 15 years

- President, J-E-T-S (Nuclear Consulting Company)
  - Provides consulting services to commercial and government clients related to quality programs, training, procedure development, and productivity improvement. Clients include DOE, USNRC, and over 20 nuclear utilities.
- BARTECH, Inc. (Nuclear Consulting/Technical Services)
  - Provided state-of-the-art consultant services to commercial clients and the U.S. Government in the areas of nuclear quality assurance and personnel training.
- Quality/Training Administrator, Newberg Corporation Nuclear Design/Construction Company.
  - Responsible for management of corporate training and qualification program for 4,000 employee nuclear design/construction company. Trained, tested, and certified over 350 QA/QC audit and inspection personnel.
- Area QC Engineer, Fruin-Colnon Engineers Nuclear Design/Build Company
  - Responsible for coordination and verification of construction quality in Fuel and Auxiliary Buildings at Clinton Nuclear Station.
- QA Technician, Carolina Power and Light Company
  - QA Technician for startup for Brunswick Nuclear Project and audits throughout system; Shearon Harris Project inspector.
- Technical Qualifications
  - Level III per ANSI N45.2.6 - all disciplines
  - American Welding Society - Certified Welding Inspector (CWI) Registration #84070131

EDUCATION: B.S., (w/Honors) Civil Engineering, Wake College

Additional coursework, Mechanical
Engineering, N.C. State University
Metallurgy/Welding, Illinois State
University

NAME: John A. Leonowich

AREAS OF RESP: Radiation Protection/Packaging and Transportation

ASSOCIATION: Battelle-Pacific Northwest Laboratories

EXPERIENCE: 15 years

- Technical Group Leader, Radiation Measurement and Modeling Group at PNL
  - Actively engaged in ionizing and non-ionizing radiation research at PNL.
- Senior radiological engineer at Hope Creek Nuclear Generating Station, New Jersey
- Radiation Protection Officer/Alternate Industrial Hygienist, Eastern Space and Missile Center, Cape Canaveral, Florida

EDUCATION: Ph.D., Radiological Engineering, Rensselaer Polytechnic Institute

OTHER: Member, ANSI Committees on Radio Frequency/Microwave and Laser Safety
Member, DOE Select Committee on External Dosimetry

NAME: Lewis S. Masson

AREAS OF RESP: Maintenance/Auxiliary Systems

ASSOCIATION: Scientech, INC.

EXPERIENCE: 34 years

- Scientech, INC.
  - Senior Associate: Provides technical assistance to U.S. DOE and U.S. Nuclear Regulatory Commission in the fields of mechanical and nuclear engineering. Participated in 4 Technical Safety Appraisals at Hanford Tank Farm, Hanford Site, Lawrence Livermore National Laboratory, and Oak Ridge National Laboratory.
- EG&G Idaho, Inc.
  - Technical support to Office of Defense Energy Projects
  - Program Manager for the Fusion Engineering Program
  - Division Manager for the Loss-of-Fluids (LOFT) Engineering Support Division
- Aerojet Nuclear Company
  - Design Engineering Manager, Special Reactor Projects
- General Electric Company
  - Manager, engineering activities for advanced nuclear propulsion systems
  - Project engineer during recovery of the damaged SL-1 reactor at INEL
  - Manager of test facilities and activities for Aircraft Nuclear Propulsion Program

EDUCATION: M.S., Nuclear Engineering, University of Idaho
B.S., Mechanical Engineering, University of California, Berkeley

OTHER: Member of American Nuclear Society and Fusion Energy Division
Executive Committee

NAME: Leon H. Meyer

AREAS OF RESP: Operations; Site/Facility Safety Review; Security/Safety Interface

ASSOCIATION: The LHM Corporation - President

EXPERIENCE: 38 years

- Technical Expert under contract to Oak Ridge Associated Universities and EG&G Idaho. Served on 30 Technical Safety Appraisals for DOE/EH.

- Savannah River Plant, E.I. du Pont de Nemours & Company, Aiken, SC

  - 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. du Pont de Nemours & Company

  - Program Manager, Technical Division: Responsible for the Defense Waste Processing Facility and the LWR Fuel Reprocessing Design Project.

- Savannah River Laboratory, E.I. du Pont de Nemours & Company, Aiken, SC

  - Assistant Director

  - Director, Separations Chemistry and Engineering Section

  - Research Manager, Separations Chemistry Division

  - Research Supervisor, Separations Engineering Division: Responsibilities in 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

NAME: William R. Murphy

AREA OF RESP: Worker Safety

ASSOCIATION: National BioSystems, Inc.

EXPERIENCE: 20 years

- Lurgi Corporation
  - Director of Safety for corporate and field operations
- Exxon - Special Assignment
  - Senior Safety Engineer responsible to the president for all matters pertaining to safety, health and environment.
- Exxon
  - Site safety responsibilities responsible for all research/laboratory/pilot plant and construction projects.
- ESSO - Venezuela
  - Monitor, inspect and implement the project Safety/Health fire protection

EDUCATION: B.S., Safety Engineering/Management, Emory-Riddle University

OTHER: Executive Secretary, National Safety Council Member, Systems Safety Society
Member, American Society of Safety Engineers

NAME: Anthony Weadock

AREA OF RESP: Radiation Protection

ASSOCIATION: DOE Headquarters - Environmental Health Division

EXPERIENCE: 13 years

- U.S. Department of Energy
  - Worked for past two years as Health Physicist in Division of Environmental Health.
- Nuclear Regulatory Commission
  - Served for five years as Radiation Specialist.
- Department of Defense
  - Worked as Health Physics Technician in the Mare Island Shipyard, Vallejo, California.
- Information Management Systems -Information Specialist
- National Institutes of Health - Biologist

EDUCATION: M.S., Zoology, University of Maryland
B.S., Biology, MacMurray College

NAME: Bernard S. Zager, M.D.

AREA OF RESP: Medical Services

ASSOCIATION: Private Consultant

EXPERIENCE: 36 years

- Consultant, Occupational Medical Programs
- Medical Director and Manager, Health and Safety Operation, General Electric Company, Nuclear Energy Operation
- Chief Physician, Automotive Assembly Division, Ford Motor Company
- Staff Physician, Michigan Bell Telephone Company
- Private practice, medicine, and surgery
- Medical Officer, Mobile Army Surgical Hospital (MASH), Korea

EDUCATION: M.D., Northwestern University
Intern and Resident, Detroit Grace Hospital
B.A., Wayne State University

OTHER: Certified Occupational Medicine, American Board Preventive Medicine
Fellow American College, Occupational Medicine
Fellow American College, Preventive Medicine

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APPENDIX A-4

Biographical Sketches of
Management Subteam Members
Energy Technology Engineering Center

Management Subteam Leader and Members

Scott T. Hinchberger
Robert Compton
Marvin J. Laster
William J. Musick
Louis A. Rancitelli
David Schweller

NAME: Scott T. Hinschberger

AREA OF RESP: Management Subteam Leader

ASSOCIATION: U.S. Department of Energy, Idaho Operations Office, Idaho Falls, Idaho

EXPERIENCE: 13 years

- U.S. Department of Energy
  - Currently Director of the Waste Management Operations Division at Idaho Operations responsible for all programs involving the storage, treatment, and disposal of low-level and transuranic radioactive, hazardous, mixed, municipal, and sanitary waste generated at the Idaho National Engineering Laboratory.
  - Served two years as Chief of the Civilian Radioactive Waste Management Branch at the Idaho Operations Office responsible for spent fuel transportation and related technology development programs.
  - Served two years as Manager of the National Low-Level Waste Program at the Idaho Operations Office responsible for developing DOE Orders and guidance documents as well as assisting States and Compact Regions in meeting the requirements of the Low-Level Waste Policy Act.
  - Served two years as an Engineering Geologist in the Crystalline Repository Program in Chicago Operations coordinating development of geotechnical, environmental, and socioeconomic plans for field investigations of potential host locations for a high-level waste repository.
- WASTREN, Inc.
  - General Manager of Idaho Falls Office responsible for office operations, financial status, business development, and overall quality and technical adequacy of client deliverables.
- EG&G Idaho, Inc.
  - Responsible for conduct of geologic and hydrologic investigations at the Idaho National Engineering Laboratory and at various DOE geothermal sites.

EDUCATION: B.A., Geology, California State University, Fullerton
Graduate courses in Hydrogeology at California State University, Fullerton and at University of Idaho

NAME: Robert Compton

AREA OF RESP: Management Assessment

ASSOCIATION: Nuclear Power Consultants, Inc.

EXPERIENCE: 22 years

- Nuclear Power Consultants, Inc.
  - Eleven years performing assessments of management, QA/QC, maintenance, operations and construction activities for governmental agencies and utilities.
  - Participated in Department of Energy Tiger Team Assessments of the Savannah River Site and the Hanford Reservation as a member of the Management Subteam.
  - Participated in 16 NRC Construction Appraisal Team inspections, two utility Safety System Functional Inspections, six ASME Inservice Testing assessments for NRC, six NRC Safety System Outage/Modification Inspections, NRC restart readiness reviews,, allegation/employee concerns resolutions, instrumentation and Motor Operated Valve program assessments, regulatory compliance program reviews and assistance.
- U.S. Nuclear Regulatory Commission
  - Four years as Senior Engineer in Regional Office. Performed inspections of civil and mechanical activities during construction, maintenance, and operations phases at commercial nuclear power plants.
- Department of Defense
  - Seven years as an Engineer and Supervisory Nuclear Engineer at a naval shipyard. Responsible for structures and fluid systems construction, modification, and testing for nuclear submarines and surface ships.

EDUCATION: B.S., Civil Engineering, California State University, Chico

NAME: Marvin J. Laster, Esq.

AREA OF RESP: Management Assessment

ASSOCIATION: Private Consultant

EXPERIENCE: 32 years

- Private consulting in environmental and safety law, management and organization
  - Participated in Tiger Team assessments of the Lawrence Livermore National Laboratory, the Paducah Gaseous Diffusion Plant, the Oak Ridge National Laboratory, and the Lawrence Berkeley Laboratory as a member of the Management Subteam.
  - Participated in DOE Headquarters Task Force to develop Management Performance Objectives and Criteria for use in Tiger Team assessments.
- U.S. Government Service
  - U.S. Atomic Energy Commission, U.S. Energy Research and Development Administration, U.S. Department of Energy, 1958-1989 - Office of General Counsel - Assistant Chief Counsel: Chicago Operations Office, Brookhaven Area Office, Princeton Area Office, New York Support Office, and Environmental Measurements Laboratory; Member, Accident Investigation Boards; Participant in annual laboratory institutional appraisal programs; Represented U.S. Government in litigation, claims, disputes.

EDUCATION: LL.B., New York University School of Law
Princeton Fellow, Public and International Affairs, Princeton University
B.A., Political Science, Brooklyn College

OTHER: Recipient, numerous Federal Government superior performance awards

NAME: William J. Musick

AREA OF RESP: Management Assessment

ASSOCIATION: Department of Energy - Headquarters, Office of Energy Research

EXPERIENCE: 21 years

- U.S. Department of Energy

  - Senior Budget Officer for the Basic Energy Sciences Program responsible for the review and defense of the Department's request for funds, ensuring that funds appropriated to the Department are used economically and efficiently, and that all funds are used in a manner consistent with Statute, Regulations, and Rules of the Department.

  - Director of the Division for Program Integration and Control in the Office of Assistant secretary for Fossil Energy responsible for accounting, auditing, budgeting planning, and project cost and schedule control related to the construction and operation of the major fossil energy synthetic fuels demonstration and pilot plant projects.

  - Chief, Budget Control Branch in the Office of Uranium Resources and Enrichment serving as chief financial officer for an annual $2 billion program with responsibility for planning, budget, and accounting of the program's operation and construction budgets.

  - Senior Budget Examiner in the Controllers Office reviewing Special Nuclear Materials Production program, Waste Management program, and the Uranium Enrichment program.

- NASA

  - Staff Accountant/Auditor working on such projects as the Delta Launch Vehicle and the NIMBUS

EDUCATION: M.B.A., Finance, University of Maryland
B.A., Accounting, University of Maryland
B.A., Business Administration, University of Maryland

OTHER: Certified Public Accountant

NAME: Louis A. Rancitelli

AREA OF RESP: Management Assessment

ASSOCIATION: Battelle, Energy Systems Group

EXPERIENCE: 24 years

- Participated in Tiger Team Assessments of the Lawrence Livermore National Laboratory, the Paducah Gaseous Diffusion Plant and the Lawrence Berkeley Laboratory as a member of the Management Subteam.

- Participated in Task Force for DOE-HQ to develop Management Performance Objectives and Criteria for use in Tiger Team management assessments, June 1990.

- Managed the Battelle West Jefferson, Ohio, Nuclear Facility. Responsible for compliance with DOE Nuclear Regulatory Commission (NRC) regulations related to nuclear materials storage, handling and transportation, waste characterization and disposal, criticality safety, and health physics.

- Conducted and managed studies related to the environmental impact of radionuclides resulting from commercial and defense reactor operations and nuclear weapons fallout.

- Conducted and managed programs to define the environmental impact of toxic trace metals resulting from fossil fuel combustion and industrial operations.

- Conducted and managed systems studies of fuel cycle wastes and disposal in various geological media.

- Managed for the NRC a uranium mine tailing study focused at defining the environmental impact.

- Managed an NRC program to define the emission, transport and deposition of radionuclides from a low-level radioactive waste site.

EDUCATION: Ph.D., Nuclear Science and Engineering, Cornell University
B.S., Chemical Engineering, Drexel Institute of Technology

NAME: David Schweller

AREA OF RESP: Management Assessment

ASSOCIATION: DBS Associates, Inc. - Private Consultant

EXPERIENCE: 36 years

- 4 years President, DBS Associates, Inc., Private Consultants in organization, management, safety, and security
- Participated in 12 TSAs
- Member of the Assistant Secretary for Environment, Health and Safety Working Group to review the TSA program
- Member of the Management Subteam for 8 previous Tiger Teams including the first Tiger Team
- Safety Advisor for DOE Security Inspection and Evaluation Teams
- Evaluator for FEMA Nuclear Utility Emergency Drills
- 10 years - Manager and Contracting Officer, U.S. DOE, Brookhaven Area Office, Upton, NY
- 14 years - Director, Safety Division, U.S. DOE, Brookhaven Area Office, Upton, NY
- 1 year - Reactor Safety Specialist, U.S. AEC, Washington, D.C.
- 2 years - Chief, Experimental Physics, Martin Nuclear Division, Middle River, MD. Designed, built, and operated three zero-powered experimental reactors
- 5 years - Reactor Physicist, Combustion Engineering Nuclear Division, Windsor, CT. Designed, built, and operated three zero-powered experimental reactor facilities

EDUCATION: B.S., Engineering Physics, N.Y.U. College of Engineering

APPENDIX B

ENVIRONMENTAL SUBTEAM DAILY AGENDAS

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE FIELD ACTIVITIES 3/18/91 - 3/22/91

DATE WEEK 1		AIR John Wood	WATER/SPCC Jim Stevens	GROUNDWATER Scot Foster	CERCLA Tom Fitch
MONDAY	AM	Introductory Talks	Orientation	Orientation	Orientation
3/18/91	PM	Site Tour; Interview with B. Melvold	Site Tour; Records review and personnel contacts	Site Tour	Site Tour
TUESDAY	AM	Reviewed all air permits with B. Melvold	Reviewed stripping tower sampling; inspected sample stations on N.W. Ditch and perimeter pond; reviewed water monitoring at SCTI; met with Plant Services	Review of SWMU's	Review of SWMUs
3/19/91	PM	Visited sites to inspect permitted units		Review of groundwater monitoring program Interview K. Schwinn - EPA	Review of SARA Title III Program
WEDNESDAY	AM	Met with VCAPCD in Ventura to review permits and AB2588 requirements	Began SPCC review; observed surface run off sampling; inspected water handling at B-463, B-013, B-356, B-228, and RMDF	Review of SWMU's	Review of SWMUs Interview with S. Lafflam; review of CERCLA/SARA Program
3/20/91	PM	Visit met site in Area IV; meet with DOE & Rocketdyne staff re: ozonator; review siting documents		Groundwater sampling review; interview D. Jasenski - GRC	Interview with J. Sherman - CERCLA/SARA reporting
THURSDAY	AM	see Radiation	Arrange to continue SPCC review; inspection of Building 065; site topography review	Document review, revisits B-59 review	Interview M. Lavesque - SARA Title III
3/21/91	PM	Meet with ABB re: ambient monitoring; observe sample collection; review siting decisions		Canoga/DeSoto/Downey review Interview P. Rutheford	Interview Facility Manager regarding CERCLA/SARA issues Bldg. 38, SCTI
FRIDAY	AM	Bldg. 59 emissions control Plummer - AB2588 review	Begin preventative maintenance record review for Env. Review NPDES, potable water system	DeSoto site visit; interview water quality control board	Interview G. Lavagnino, DOE-SAN; interview P. Horton, RMDF
3/22/91	PM	Document review	SABER visit	Interview A. Nelson - B-59 records review	Interview S. Lafflam Records review

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE FIELD ACTIVITIES 3/18/91 - 3/22/91

DATE WEEK 1		WASTE/UST Dick Hall	RADIATION Chris Martel	QUALITY ASSURANCE Joe Swiniarski	TSCA/FIFRA Raeann Reid
MONDAY	AM	Orientation	Orientation	Orientation	Orientation
3/18/91	PM	Facility tour; interview P. Olson	Review of documents	Interview M. Tessier, QA training	Records review; interview w/ J. Taggart
TUESDAY	AM	Tour Waste Generation Bldg. SCTI, SCTL, TTF	Interview w/ P. Rutherford, some input from J. Moore, B. Tuttle	Water sampling	
3/19/91	PM	Same as AM	Interview w/ P. Horton, B. Basset, M. Sujata; tour of RMDF	Analytical lab site visit and procedures review begin SOP review.	Meetings w/ C. Gibbs, L. Miccolis, B. Graham; meeting w/ community work groups
WEDNESDAY	AM	Tour Waste Generation Bldgs., LLTR, LLDL	Interview P. Horton, B. Basset; visit 900 Tar Building, 059, 067	Air sampling with A. Nelson - Rocketdyne; groundwater sampling with Foster, Crippen	Interview with N. Fodor - asbestos; tour chemical storage areas with A. Walters; interview with T. Barbian - DeSoto Transformer; interview with J. Grizzel - Chemical Purchasing; Emergency Drill Meeting
3/20/91	PM	Record Review	Interview J. Moore on Airdos PC input parameters; review air sample collection procedures	Document review	
THURSDAY	AM	Records review	Rad air sampling procedures; finish AIRDOS PC with J. Mare; meet with D. Hickman	Air sampling; revisit Analytical Lab; data tracking	Emergency Drill
3/21/91	PM	Visit RMDF (B-022)	Review lab protocols, procedures, QA/QC	Radiation Lab Q/QC Interview	Interview with H. Zweig, S. Klee, Chemist
FRIDAY	AM	DeSoto site visit	Interview G. Watson - RMDF pond and sewer plant radiation detectors	Rocketdyne QA Manager interview Analytical Lab revisit	Interview A. Walter, HAZMAT storage, tour Interview N. Fodor, asbestos, tours
3/22/91	PM	Visit Bldg. 923 Records review	Interview V. SABA - soil and surface water sampling Bldg. 064 tour with P. Horton	Document review	Interview J. Grizzell, HAZMAT purchasing practices; records review

ENVIRONMENTAL SUBTEAM
SCHEDULE OF ONSITE FIELD ACTIVITIES 3/18/91 - 3/22/91

DATE WEEK 1		NEPA I Lorene Sigal	NEPA II Cynthia Heckman	NEPA III John Pulliam	NEPA IV Alex Teimouri
MONDAY	AM	Orientation, site tour	Orientation; site tour	Orientation; site tour	Orientation; site tour
3/18/91	PM	Initial meeting with DOE & ETEC	Document review	Initial meeting with DOE and ETEC	Initial meeting with DOE and ETEC
TUESDAY	AM	Interviews with B. Le Chevalier (Site Office, DOE); C. Simkins (SAN); J. Wood (Site Office); P. Olson (ETEC)	Document Review	Reviewed NEPA Guidance	Interview with R. Liddle (EM) and C. Simkins on NEPA/CERCLA
3/19/91	PM	Same as Above	Same as Above	Same as Above	
WEDNESDAY	AM	Interview D. Zweng (ETEC), R. Liddle (SAN), J. Hartman (SAN), G. Gaylord (ETEC), F. Poucher (ETEC)	Document review	Interview w/ P. Olson, ETEC QA & Training, G. Gaylord, Facility Programs and R. Liddle, DOE/EM Program Manager	Interview w/ P. Olson, ETEC QA & Training, G. Gaylord, Facility Programs and R. Liddle, DOE/EM Program Manager
3/20/91	PM			Review procedures	Reviewed 5-Yr Restoration Plan
THURSDAY	AM	Interview J. Chavez	Document review	Document review	Document review
3/21/91	PM	Meeting with ETEC, SAN & HQ NEPA personnel			
FRIDAY	AM	Interview with M. Tessier	Document review; develop findings	Meet with C. Simkins, J. Wood, R. Sharma/Semko	Develop findings
3/22/91	PM	Develop findings		Develop findings	

APPENDIX C

ENVIRONMENTAL AND MANAGEMENT SUBTEAMS CONTACTS AND INTERVIEWS

(ATTACHED ON MICROFICHE)

APPENDIX D

LIST OF SITE DOCUMENTS REVIEWED BY THE ENVIRONMENTAL SUBTEAM

(ATTACHED ON MICROFICHE)

APPENDIX E

ENVIRONMENT, SAFETY, AND HEALTH HOTLINE REPORTS AND RESPONSES

Environment, Safety, and Health Hotline
Reports and Responses
Energy Technology Engineering Center

An onsite Tiger Team Assessment hotline for collecting information was established for the ETEC assessment and operated between March 18 and April 5, 1991. The hotline was established to enable ETEC personnel and the general public to report specific environment, safety and health concerns. Notices of the hotline were made through site newsletters distributed to each ETEC organizational entity as well as through local newspapers. Notices also informed ETEC employees 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, 202-586-4073, or (FTS) 896-4073.

This appendix summarizes the telephone calls and letters received on the hotline and the subsequent responses or actions taken.

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ENERGY TECHNOLOGY ENGINEERING CENTER HOTLINE CALLS

CONTROL #ENV-1

DATE:	March 19, 1991
NATURE OF CONCERN:	The caller has read of high incidences of bladder cancer in the area and wishes to find out more information. The caller had previously requested such information of Rocketdyne.
RESPONSE:	The Tiger Team Leader identified 3 contacts within the California Department of Health Services: Dr. Robert Holtzer at (916) 324-2829, Ms. Eleanor Blake at (415) 540-3657, and Dr. Lynn Goldman at (415) 540-3657. He provided these contacts to the caller who expressed her appreciation for the information and stated she was glad the Tiger Team was on site. Subsequently, an additional contact was identified - Mr. Phillip Jacobs on (213) 744-3235.

CONTROL #ENV-2

DATE:	March 20, 1991
NATURE OF CONCERN:	The caller spoke to Don McCann, a retired ground water geologist, (213) 680-3801), about the disposal of an old nuclear reactor in the late 1950's. It was supposedly placed in concrete and dropped into the Catalina Channel.
RESPONSE:	A historical unclassified document was reviewed by Chris Martel of the Environmental Subteam. This document detailed the type of waste disposal by Rockwell in the Catalina Channel. The waste that was disposed of included solidified liquid radioactive waste and solid radioactive waste. The disposal site was approved by the Atomic Energy Commission and all disposal was conducted in accordance with the requirements of the time period. A nuclear reactor was not among the wastes disposed of in this manner.

CONTROL #ENV-3

DATE: March 20, 1991

NATURE OF CONCERN: The caller is concerned with the high rate of women diagnosed with breast cancer in her area. The caller mentioned that 3 out of 4 women within the area have been diagnosed, and one of these women died from breast cancer. The caller is interested in information relating to any investigations which may have been completed or are in the process regarding these incidences.

RESPONSE: The Tiger Team Leader identified that the California Department of Health Services had responsibility for studying cancer rates in the area and the following individuals may be called for information: Mr. Phillip Jacobs (213) 744-3235; Dr. Bob Holtzer (916) 324-2829; or Ms. Eleanor Blake (415) 540-3657.

CONTROL #SH-4

DATE: March 21, 1991

NATURE OF CONCERN: The caller is concerned with the large number of people within the area being diagnosed with cancer. The caller would like to know if there is any way to get her yard or water tested, and also offered her yard or water to be used as possible test samples.

RESPONSE: Three names of the California Health Services Department were given to the caller to find out about checking the water.

CONTROL #SH-5

DATE: March 22, 1991

NATURE OF CONCERN: The caller worked at Rocketdyne between 1962 - 1971 and noticed many safety factors which were not enforced, and also was witness to improper waste disposal. He would like to discuss the above with someone, because now he has health concerns. The caller was diagnosed with skin cancer.

RESPONSE: The Health and Safety Subteam responded to the caller and explained if the radiation dose records from 1962 - 1971 are available, that information would be provided to him.

CONTROL #ENV-6

DATE: March 25, 1991

NATURE OF CONCERN: The caller owns property around the Brandies area and wants to know how the facility may affect the property.

RESPONSE: A member of the Environmental Subteam responded and explained the scope of the Tiger Team process and that information regarding contamination releases will be featured in the report. The caller was referred to the 1989 Preliminary Survey Report for ETEC for information on historical releases.

CONTROL #ENV-7

DATE: March 26, 1991

NATURE OF CONCERN: The caller would like to know if the water in the wells in the Dayton Canyon area is safe.

RESPONSE: Scot Foster of the Environmental Subteam contacted the caller's wife and explained to her the nature of Rockwell's offsite monitoring program. It was also explained that based on the groundwater data from that area, there were no indications of groundwater contamination originating from the SSFL.

CONTROL #SH-8

DATE: March 29, 1991

NATURE OF CONCERN: The caller has knowledge of several grievances regarding handling of beryllium at the Canoga Facility. There has not been any notification to employees about proper handling procedures and the hazards of beryllium, and there are no material safety data sheets being kept. Also, the caller knows of a large amount of fluorescent tubes being improperly disposed.

RESPONSE: Gary Gottfried of the Safety and Health Subteam spoke to the caller on April 4, 1991. As the operations referred to are NASA-sponsored, the caller was provided with the name, address, and phone number of the NASA Inspector General, Mr. Frank Rippetoe. The caller stated he was satisfied and that he would follow-up.

CONTROL #SH-9

DATE: April 3, 1991

NATURE OF CONCERN: The caller wanted to know if we were reviewing the DeSoto Plant and what we the intentions of the review were. He notified us that there may be some concern of hot areas in Bldgs. 101 and 104.

RESPONSE: Doug Abramson of the Health and Safety Subteam contacted the caller and discussed the limits of the Tiger Team activities at the DeSoto Facility. The caller had no inquiries, he only stated that he had performed some radiation surveys in Bldg. 101 and that the levels did not appear to be dangerous.

APPENDIX F

OSHA NONCOMPLIANCE

(ATTACHED ON MICROFICHE)

APPENDIX G

DEFINITION OF ENVIRONMENTAL SUBTEAM FINDING ROOT CAUSES AND CONTRIBUTING CAUSAL FACTORS

DEFINITION OF ENVIRONMENTAL SUBTEAM FINDING ROOT CAUSES AND CONTRIBUTING CAUSAL FACTORS

ROOT CAUSES

Policy

Evaluate if ineffective, outdated, or nonexistent policies contributed to the finding.

Policy Implementation

Ascertain if written policies reflecting Federal, State, and local laws and regulations, codes, and standards were appropriately disseminated, implemented, and updated.

CAUSAL FACTORS

Procedures

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, the procedures contributed to the finding.

Personnel

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.

Resources

Ascertain if the allocation of resources was a contributing factor to the finding.

Training

Identify if inadequate personnel training on implementing site policy, DOE Orders, and applicable Federal, State, and local laws and regulations was a contributing factor to the finding.

Change

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.

Appraisals/Reviews

Determine if ineffective or insufficient appraisals/reviews were contributing factors to the finding.

Human Factors

Ascertain if human factors, such as fatigue or deliberate circumvention of a safety system, were contributing factors to the finding.

Barriers and Controls

Determine if inadequacies in established barriers and controls, both administrative and physical, including operational readiness, routine inspections, and preventative maintenance, and/or a lack of these controls contributed to the finding.

Quality Assurance/Quality Control

Identify if inadequacies in the quality assurance/control program were causal factors in the identified findings. This includes inadequate follow up to previously identified findings.