REFERENCE COPY C.2

Pre-Tiger Team Self-Assessment Report

January 1991

SAND90-2827

SNLA LIBRARY
* 8 3 3 8 5 5 9 *
SAND90-2827
0002
UNCLASSIFIED
01/91
UP
RPTS
~~RREF~~

Sandia National Laboratories

Albuquerque • Tonopah • Kauai

SAND90-2827
Category UC-600
Unlimited Release
Printed January 1991

Issued by Sandia National Laboratories, operated for by the United States Department of Energy by Sandia Corporation.
NOTICE: This report was prepared as an account of work sponsored by an agency of the United States Government. Neither the United States Government nor any agency thereof, nor any of their employees, nor any of their contractors, subcontractors, or their employees, makes any warranty, express or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. Reference herein to any specific commercial product, process, or service by trade name, trademark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the United States Government, any agency thereof or any of their contractors of subcontractors. The views and opinions expressed herein do not necessarily state or reflect those of the United States Government, any agency thereof or any of their contractors.

Printed in the United States of America. This report has been reproduced directly from the best available copy.

Available to DOE and DOE contractors from
Office of Scientific and Technical Information
PO Box 62
Oak Ridge, TN 37831

Prices available from (615) 576-8401, FTS 626-8401

Available to the public from
National Technical Information Service
US Department of Commerce
5285 Port Royal Rd
Springfield, VA 22161

SANDIA NATIONAL LABORATORIES
Albuquerque, New Mexico

Pre-Tiger Team Self-Assessment

January 1991

TABLE OF CONTENTS

Chapter 1: Introduction **I-1**

1. Introduction I-2

1.1 Purpose and Scope I-2
1.2 Site Descriptions I-3

1.2.1 Site Description, SNL, Albuquerque I-3
1.2.2 Site Description, Kauai Test Facility I-8
1.2.3 Site Description, Tonopah Test Range I-11

1.3 Laboratory Organization I-14
1.4 Methodology I-15

Chapter 2: Root Causes and Key Findings **II-1**

2. Root Causes and Key Findings II-2

2.1 Root Causes and Action Plan Requirements II-2

2.1.1 Overview II-2
2.1.2 Root Cause R1 ..... II-2
2.1.3 Root Cause R2 ..... II-3
2.1.4 Root Cause R3 ..... II-5

2.2 Key Findings and Action Plan Requirements II-6

2.2.1 Overview II-6
2.2.2 Key Findings II-6

Chapter 3: Environmental Protection Assessment **III-1**

3. Environmental Protection Assessment III-2

3.1 Purpose III-2
3.2 Scope III-2
3.3 Methodology III-2
3.4 Significant Findings and Action Plan Requirements III-4

3.4.1 Clean Air Act III-4

3.4.1.1 Overview III-4
3.4.1.2 Significant Findings III-6
3.4.1.3 Action Plan Requirements III-9

3.4.2 Clean Water Act III-10

3.4.2.1 Overview III-10
3.4.2.2 Significant Findings III-11
3.4.2.3 Action Plan Requirements III-12

3.4.3 Comprehensive Environmental Response, Compensation, and Liability Act and the Superfund Amendments and Reauthorization Act III-12

3.4.3.1 Overview III-12
3.4.3.2 Significant Findings III-13
3.4.3.3 Action Plan Requirements III-15

3.4.4 Federal Insecticide, Fungicide, and Rodenticide Act III-15

3.4.4.1 Overview III-15
3.4.4.2 Significant Findings III-16
3.4.4.3 Action Plan Requirements III-16

3.4.5 Hazardous Materials Transportation Act III-17

3.4.5.1 Overview III-17
3.4.5.2 Significant Findings III-17

3.4.6 Natural and Cultural Resources, Including the National Environmental Policy Act III-18

3.4.6.1 Overview III-18
3.4.6.2 Significant Findings III-18
3.4.6.3 Action Plan Requirements III-22

3.4.7 Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments III-22

3.4.7.1 Overview III-22
3.4.7.2 Significant Findings III-24
3.4.7.3 Action Plan Requirements III-25

3.4.8 Safe Drinking Water Act III-26

3.4.8.1 Overview III-26
3.4.8.2 Significant Findings III-27
3.4.8.3 Action Plan Requirements III-28

3.4.9 Toxic Substances Control Act III-29

3.4.9.1 Overview III-29
3.4.9.2 Significant Findings III-29
3.4.9.3 Action Plan Requirements III-30

3.4.10 Groundwater III-30

3.4.10.1 Overview III-30
3.4.10.2 Significant Findings III-31
3.4.10.3 Action Plan Requirements III-32

3.4.11 Hazardous Materials Storage III-33

3.4.11.1 Overview III-33
3.4.11.2 Significant Findings III-34
3.4.11.3 Action Plan Requirements III-34

3.4.12 Management Controls III-34

3.4.12.1 Overview III-34
3.4.12.2 Significant Findings III-35
3.4.12.3 Action Plan Requirements III-37

3.4.13 Quality Assurance/Quality Control III-38

3.4.13.1 Overview III-38
3.4.13.2 Significant Findings III-38
3.4.13.3 Action Plan Requirements III-40

3.4.14 Radiation III-40

3.4.14.1 Overview III-40
3.4.14.2 Significant Findings III-41
3.4.14.3 Action Plan Requirements III-42

3.4.15 Soil/Sediment/Biota (Environmental Surveillance Monitoring) III-42

3.4.15.1 Overview III-42
3.4.15.2 Significant Findings III-42
3.4.15.3 Action Plan Requirements III-45

3.4.16 Radioactive and Mixed Waste III-45

3.4.16.1 Overview III-45
3.4.16.2 Significant Findings III-45
3.4.16.3 Action Plan Requirements III-47

Chapter 4: Safety and Health Assessment IV-1

4. Safety and Health Assessment IV-2

4.1 Purpose IV-2
4.2 Scope IV-2
4.3 Methodology IV-2
4.4 Significant Findings and Action Plan Requirements IV-3

4.4.1 Organization and Administration IV-3

4.4.1.1 Overview IV-3
4.4.1.2 Significant Findings IV-4
4.4.1.3 Action Plan Requirements IV-5

4.4.2 Quality Verification IV-6

4.4.2.1 Overview IV-6
4.4.2.2 Significant Findings IV-7
4.4.2.3 Action Plan Requirements IV-9

4.4.3 Operations IV-11

4.4.3.1 Overview IV-11
4.4.3.2 Significant Findings IV-12
4.4.3.3 Action Plan Requirements IV-15

4.4.4 Maintenance IV-16

4.4.4.1 Overview IV-16
4.4.4.2 Significant Findings IV-17
4.4.4.3 Action Plan Requirements IV-20

4.4.5 Training and Certification IV-21

4.4.5.1 Overview IV-21
4.4.5.2 Significant Findings IV-21
4.4.5.3 Action Plan Requirements IV-23

4.4.6 Auxiliary Systems IV-24

4.4.6.1 Overview IV-24
4.4.6.2 Significant Findings IV-24
4.4.6.3 Action Plan Requirements IV-26

4.4.7 Emergency Preparedness IV-26

4.4.7.1 Overview IV-26
4.4.7.2 Significant Findings IV-28
4.4.7.3 Action Plan Requirements IV-29

4.4.8 Technical Support IV-29

4.4.8.1 Overview IV-29
4.4.8.2 Significant Findings IV-30
4.4.8.3 Action Plan Requirements IV-31

4.4.9 Packaging and Transportation IV-31

4.4.9.1 Overview IV-31
4.4.9.2 Significant Findings IV-33
4.4.9.3 Action Plan Requirements IV-37

4.4.10 Nuclear Criticality Safety IV-39

4.4.10.1 Overview IV-39
4.4.10.2 Significant Findings IV-40
4.4.10.3 Action Plan Requirements IV-42

4.4.11 Security/Safety Interface IV-42

4.4.11.1 Overview IV-42
4.4.11.2 Significant Findings IV-43
4.4.11.3 Action Plan Requirements IV-44

4.4.12 Experimental Activities IV-44

4.4.12.1 Overview IV-44
4.4.12.2 Significant Findings IV-45
4.4.12.3 Action Plan Requirements IV-46

4.4.13 Site/Facility Safety Review IV-47

4.4.13.1 Overview IV-47
4.4.13.2 Significant Findings IV-47
4.4.13.3 Action Plan Requirements IV-49

4.4.14 Radiological Protection IV-49

4.4.14.1 Overview IV-49
4.4.14.2 Significant Findings IV-50
4.4.14.3 Action Plan Requirements IV-61

4.4.15 Personnel Protection IV-63

4.4.16 Industrial Hygiene IV-64

4.4.16.1 Overview IV-64
4.4.16.2 Significant Findings IV-64
4.4.16.3 Action Plan Requirements IV-65

4.4.17 Occupational Safety IV-66

4.4.17.1 Overview IV-66
4.4.17.2 Significant Findings IV-67
4.4.17.3 Action Plan Requirements IV-71

4.4.18 Fire Protection IV-72

4.4.18.1 Overview IV-72
4.4.18.2 Significant Findings IV-74
4.4.18.3 Action Plan Requirements IV-81

4.4.19 Aviation Safety IV-82

4.4.19.1 Overview IV-82
4.4.19.2 Significant Findings IV-83
4.4.19.3 Action Plan Requirements IV-84

4.4.20 Medical Services IV-84

4.4.20.1 Overview IV-84
4.4.20.2 Significant Findings IV-85
4.4.20.3 Action Plan Requirements IV-87

4.4.21 Firearms Safety IV-88

4.4.21.1 Overview IV-88
4.4.21.2 Significant Findings IV-89
4.4.21.3 Action Plan Requirements IV-91

4.4.22 Electrical Safety IV-91

4.4.22.1 Overview IV-91
4.4.22.2 Significant Findings IV-92
4.4.22.3 Action Plan Requirements IV-93

4.4.23 Worker Safety and Health Compliance (OSHA) Industrial..... V-94

4.4.23.1 Overview V-94
4.4.23.2 Significant Findings V-95
4.4.23.3 Action Plan Requirements V-109

4.4.24 Worker Safety and Health Compliance (OSHA) Construction V-112

4.4.24.1 Overview V-112
4.4.24.2 Significant Findings V-114
4.4.24.3 Action Plan Requirements V-125

Chapter 5: Management Practices Assessment V-1

5. Management Practices Assessment V-2

5.1 Purpose V-2
5.2 Scope V-2
5.3 Methodology V-2
5.4 Significant Findings and Action Plan Requirements V-3

5.4.1 Organization V-3

5.4.1.1 Overview V-3
5.4.1.2 Significant Findings V-3
5.4.1.3 Action Plan Requirements V-5

5.4.2 Management Qualifications V-5

5.4.2.1 Overview V-5
5.4.2.2 Significant Findings V-6
5.4.2.3 Action Plan Requirements V-7

5.4.3 Personnel V-7

5.4.3.1 Overview V-7
5.4.3.2 Significant Findings V-7
5.4.3.3 Action Plan Requirements V-9

5.4.4 Management Systems V-9

5.4.4.1 Overview V-9
5.4.4.2 Significant Findings V-10
5.4.4.3 Action Plan Requirements V-11

Appendix A: SNL Site Maps

Appendix B: Self-Assessment Working Group (SAWG) Project Plan

Appendix C: Abbreviations and Acronyms

Appendix D: List of Program Areas and Performance Objectives

Appendix E: AMO Self-Assessment

LIST OF FIGURES

Figure 1. SNL, Albuquerque I-18
Figure 2. Kauai Test Facility I-19
Figure 3. Tonopah Test Range I-20
Figure 4. SNL Organization Chart I-21
Figure 5. ES&H Structure (July 1990) I-22

SANDIA NATIONAL LABORATORIES
Albuquerque, New Mexico

Pre-Tiger Team Self-Assessment
Executive Summary

This report documents the results of the Pre-Tiger Team Self-Assessment (PTTSA) review performed at Sandia National Laboratories (SNL -- Albuquerque, New Mexico; Tonopah, Nevada; and Kauai, Hawaii) from October through December 1990. Areas covered by the assessment included Environment, Safety, and Health (including OSHA), and Management Practices. The review was conducted by 19 Department Managers with support from ES&H professionals. The assessment focused on the identification of ES&H requirements and determination of the degree of Sandia compliance with those requirements as of July 1990.

Initial data were gathered from corporate-wide responses to over 3,000 performance objective-based surveys called findings input sheets (FIS) that were widely circulated. These questionnaires primarily restated DOE Technical Safety Appraisal, DOE Environmental Audit Manual, and DOE Management Appraisal program performance criteria as questions to which Laboratories personnel were to respond regarding activities in their area. Because the questionnaires covered all aspects of Sandia activities, the Self-Assessment Working Group screened the questionnaires and directed them to representative Sandia managers and executives with work activities or facilities relevant to the questionnaires. Responses were obtained from SNL, Albuquerque, Tonopah, and Kauai organizations as well as members of management at all levels.

Analysis of these responses, in conjunction with interviews and field observations, produced approximately 300 significant findings that describe areas in which SNL either does not comply with ES&H requirements or is not using best management practices. These significant findings exhibited a number of commonalities that allowed their consolidation into the 17 key findings listed below. An analysis of the key findings led the self-assessment working group to identify the following root causes:

ROOT CAUSES:

RC-01 A general belief exists that "there is no problem."

Before the SNL, Livermore, Tiger Team assessment, SNL management and most employees did not perceive the Laboratories as having an ES&H problem. This perception forms the basis for all past ES&H operational practices.

RC-02 Management and staff lack understanding of ES&H rules and regulations and their applicability to SNL.

SNL management and staff have minimal training in and understanding of the various ES&H rules and regulations and of DOE orders. In addition, they do

not understand if or how to apply these regulations to make SNL a safer, healthier, and more environmentally sound operation.

RC-03 Management and staff believe the ES&H compliance requirements and implementation process are incompatible with the current SNL culture.

SNL management has a philosophy of hiring good people and trusting them to perform their work safely and without insult to the environment. This "hands-off" management style is not compatible with the formality of operations required for ES&H compliance. To ensure ES&H compliance, this management style must be augmented by procedures with characteristics of greater formality and better definition of responsibilities.

KEY FINDINGS

KF-01 The present SNL ES&H program is incomplete and does not ensure that all ES&H requirements are properly interpreted and implemented in a consistent and auditable manner.

KF-02 The current self-assessment process, which is based on VP SHEACs (Safety, Health, and Environmental Appraisal Committees) and specialized safety committees (e.g., reactors, explosives), has not been effective in measuring the status of ES&H compliance nor in identifying and eliminating deficiencies and associated root causes.

KF-03 SNL has not implemented DOE Order 5480.19, Guidelines for the Conduct of Operations at DOE Facilities.

KF-04 Facilities engineering at SNL, Albuquerque, is not accomplishing correction of deficiencies or modifications in a timely manner to support line organizations trying to come into compliance with DOE requirements.

KF-05 SNL, Albuquerque, TTR, and KTF are generally not in compliance with the requirements of 29 CFR 1910, Occupational Safety and Health Standards, as implemented through DOE Order 5483.1A, Occupational Safety and Health Requirements for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities.

KF-06 Construction activities at SNL, Albuquerque, TTR, and KTF are not in full compliance with 29 CFR 1926, Safety and Health Regulations for Construction, as required by DOE Order 5480.9, Construction Safety and Health Program.

KF-07 SNL does not have an ES&H quality assurance (QA) program as required by DOE Order 5480.1B and DOE/AL Order 5700.1B. The SNL Quality Plan dated April 1986 is not effectively implemented and has little impact on the operational success of ES&H activities.

KF-08 There is insufficient communication of requirements between line organizations, who are familiar with operations being conducted, and ES&H professionals, who understand environmental laws and safety and health regulations.

KF-09 SNL does not have a lessons-learned program to profit from incidents at SNL and other facilities.

KF-10 SNL does not have an ES&H issues-management program.

KF-11 ES&H training is largely informal and undocumented. The present system does not ensure that management and staff have all the knowledge they need to carry out their ES&H responsibilities.

KF-12 SNL personnel, in general, treat waste, excess material, and pollutants with less concern and attention than they do their project's products and new materials.

KF-13 There is a lack of management understanding of the workload involved in meeting ENV requirements and internal and external customer needs and demands.

KF-14 The ES&H-related records management program is inadequate.

KF-15 SNL lacks an ES&H-based performance assessment system by which management can provide feedback to individuals on their ES&H-related performance.

KF-16 DOE, EPA, and state regulatory agencies want to provide SNL with timely responses to reports, permit applications, and information requests. However, the current response times from these agencies are not conducive to efficient implementation of SNL requirements for environmental protection.

KF-17 There is a need to improve the commitment and resources devoted to NEPA compliance and the minimization of hazardous materials use, waste generation, and pollution creation.

This self-assessment specifies corrective action requirements for each of the above issues as well as action plan requirements for other significant findings identified in this report. In the companion volume to this report, action plan requirements have been grouped and prioritized into action plans for implementation. As applicable, these action plans are directed toward the 17 Sandia ES&H programs that are being developed by Directorate 3200. These action plans are an intermediate step between the identification of a problem or a finding in the self-assessment report and the execution of the solution. These action plans contain the requirements and an estimate of the resources required to implement that solution.

This self-assessment, its findings, and root causes analysis present a challenge to everyone at Sandia. This report identifies pervasive practices in the conduct of ES&H activities that must be corrected and improved to permit Sandia to become a model of ES&H excellence. All personnel from executive to individual employee will have to develop ES&H practices as second nature before we can move to a level of excellence and leadership. The root causes included in this report must be faced squarely. The key findings must be thoughtfully reviewed by the Sandia ES&H Council as they direct the commitment of resources specified in the action plans.

Chapter 1
Introduction

Chapter 1

Introduction

1. Introduction

Sandia National Laboratories (SNL) is operated on a no-profit, no-fee basis for the United States Department of Energy by Sandia Corporation, a wholly owned subsidiary of the American Telephone and Telegraph Company.

SNL is one of the nation's largest research and development (R&D) facilities. Its headquarters and main laboratory are located at Kirtland Air Force Base (KAFB), on the southeast edge of Albuquerque, New Mexico. Additional facilities are located at the Tonopah Test Range (TTR) near Tonopah, Nevada, and at the Kauai Test Facility (KTF) in Hawaii. In addition, a facility is maintained in Livermore, California, which was the subject of a Department of Energy (DOE) Environment, Safety, and Health (ES&H) Tiger Team Assessment in May 1990.

On June 27, 1989, Secretary of Energy Admiral James D. Watkins announced a ten-point initiative to strengthen environmental protection and waste management activities in the DOE. One initiative established Tiger Team Assessments of the DOE's Management and Operating (M&O) contractor-operated facilities, such as SNL. Beginning in spring 1990, each facility was required to submit a Pre-Tiger Team Self-Assessment to the reviewing Tiger Team no later than 30 days before the Tiger Team assessment of that facility.

This document presents the Pre-Tiger Team Self-Assessment for SNL, Albuquerque, which includes TTR and KTF. Because the SNL facilities in Livermore were the subject of a previous Tiger Team assessment, they are excluded from this report.

1.1 Purpose and Scope

This self-assessment is intended to inform the DOE of SNL's evaluation of deficiencies in its ES&H activities as well as corresponding plans for corrective action. The self-assessment addresses:

* Compliance with applicable federal, state, and local regulations, requirements, permits, agreements, orders, and consent decrees relating to ES&H

* Compliance with DOE order requirements for SNL's ES&H activities

* The adequacy of SNL's ES&H management programs, including planning, organization, resources, training, and relationships with regulatory agencies and the public

* Conformance with applicable "best" or "accepted industry practices"

* Compliance with the performance objectives and criteria for technical safety appraisals (TSAs) at DOE facilities and sites

* Compliance with performance objectives and criteria for environmental appraisals at DOE facilities and sites

* Identification of root causes of noncompliance and nonconformance

The self-assessment focuses on three functional areas: (1) awareness of and compliance with environmental regulations, (2) safety and health assurance, including compliance with Occupational Safety and Health Administration (OSHA) regulations, and (3) management practices. Where deficiencies are identified, corrective action plans are developed to address them.

1.2 Site Descriptions

1.2.1 Site Description, SNL, Albuquerque

SNL, Albuquerque (Figure 1), is located on the southeast edge of Albuquerque, New Mexico, within the boundaries of Kirtland Air Force Base (KAFB), in Bernalillo County. It consists of five technical areas and remote test areas situated in the eastern half of the 190 km^2 KAFB military reservation. KAFB is located on two broad mesas that are bisected by Tijeras Arroyo, an east-west canyon. These mesas are bounded by the Manzano mountains (Cibola National Forest) to the east and the Rio Grande to the west. Elevations in the Albuquerque area range from a low of 1,500 m at the Rio Grande to a high of 3,300 m at the crest of the Sandia mountains adjacent to Albuquerque. KAFB is at a mean elevation of 1,630 m.

The largest population center in Bernalillo County, and also the closest population center to KAFB, is Albuquerque, which bounds the base on the north, west, and east. The 1980 census lists Albuquerque's population as 331,767. The Isleta Indian Pueblo, which borders KAFB on the south, is the next nearest population center, with a 1980 population of 1,872. An estimated total population of 450,000 people live within an 80 km radius of KAFB. This includes permanent residents of KAFB living in the KAFB housing areas.

Climate and Meteorology

Albuquerque temperatures are characteristic of high-altitude, dry continental climates. Daily temperature ranges are wide, although temperature extremes beyond -18°C and +38°C occur infrequently. Daytime temperatures during the winter average less than +5°C. In July, the maximum temperature may reach +34°C.

Average annual precipitation, as measured over the past 30 years, is 21 cm; half of this occurs from July through September in the form of brief thunder showers. Winter months are typically dry, with less than 5 cm of precipitation normally recorded.

The average annual relative humidity is about 43%, although the humidity drops to less than 20% in April, May, and June. Strong winds, often accompanied by blowing dust, occur mostly in late winter and early spring. Maximum wind speeds exceed 13 m/s for less than 48 days each year. Prevailing surface winds on KAFB are from the east. Rapid nighttime ground cooling typically produces strong temperature inversions as well as strong drainage winds down Tijeras Canyon.

Geology

The SNL facilities in Albuquerque are located within the Albuquerque basin, which is bounded by the Sandia, Manzanita, and Manzano mountains on the east and the Lucero and Jemez uplifts (or mesas) to the west. The Albuquerque basin consists of up to 3,660 m of Miocene-Pliocene-Santa Fe alluvial and colluvial sediments, which were formed by a complex mixture of aeolian, channel, debris flow, levee, and floodplain mechanisms.

The general stratigraphy of sediments consists primarily of deposits of sands and gravels interbedded with silt- and clay-rich zones. The presence of fine-grained to coarse-grained sequences in the stratigraphy is important in that typically these deposits have lenticular shapes in cross section. The nature of the cross sections observed in drilling activities has confirmed the sedimentary deposits and the presence of silt- and clay-rich zones that are discontinuous across the site.

Hydrology

The major hydrologic surface feature in central New Mexico is the Rio Grande, which runs north-south through Albuquerque and is approximately 8 km west of KAFB. Rio Grande water is primarily used for irrigation of crops. There are no continuously running streams on KAFB. Tijeras Arroyo has intermittent flow during heavy thundershowers.

The uppermost aquifer underlying the site is approximately 146 m below the ground surface. No perched aquifers have been detected in the zone between the main aquifer and the ground surface. Although drilling has not been performed to the entire depth of the aquifer, it is possible that the entire 3,660 m of the Santa Fe formation contains groundwater.

The groundwater underlying SNL facilities is separated into two systems by major faulting. The Hubble Springs, Tijeras, and Sandia faults separate the hydrogeology into a somewhat deep region west of the faults and a much more

shallow region east of the faults. Many of the SNL facilities are located west of the fault systems in the area of deeper groundwater.

West of the fault systems, the groundwater flows in a northwesterly direction. Before the growth of the city of Albuquerque, the flow was reported to be more westerly. The municipal and domestic water needs of the Albuquerque vicinity are obtained from the groundwater. Wells range from 148 m to 365 m in depth, with an average depth of 305 m. Pumping from municipal supply wells has significantly altered the groundwater flow direction.

The hydrology east of the fault systems is poorly understood because the number of water supply wells is limited, no monitoring wells exist, and the geology between the fault systems and the mountains is very complex. The SNL facilities located in this area are generally in the canyons on the Manzanita mountains. The groundwater flow would typically be out the canyons and toward the fault systems.

Biology

New Mexico has low precipitation, wide temperature extremes, frequent drying winds, heavy showers with erosive effects, and erratic seasonal distribution of precipitation. The semidesert, southwest climate combines with the low availability of water to produce many species of drought-resistant flora such as cacti.

The mesa vegetation of KAFB consists of grasses and shrubs. Juniper and cacti are present at the higher elevations bordering the mountains east of KAFB. Russian thistle (tumbleweeds) proliferate in mechanically disturbed areas. The city of Albuquerque has flora typically found in urban environments.

Occupancy

SNL, Albuquerque, consists of five technical areas and several additional test areas. Each area has its own distinctive operations. A brief description of the activities in each area follows. Maps of SNL, Albuquerque, TTR, and KTF are provided in Appendix A.

Area I has the largest employee population (approximately 5,000). This area is dedicated primarily to research, development, and design of weapons systems, limited production of weapon system components, and energy programs. It also includes laboratories and shops used by administrative and technical staff. Potential sources for nonradioactive effluents include the paint shops, toxic machine shop, process development lab, emergency diesel generator plant, solvent spray booth, foundry, and steam plant. There is the potential for radioactive tritium (H-3) release from two laboratory sources. In addition, other sources of radiation exist in locations such as Buildings 828 and 867.

Area II is a small facility used for explosive testing. Microcurie amounts of tritium may be released each year from component testing. Techniques for measuring fractures in geologic strata are developed at this facility. A stabilized, low-level radioactive waste disposal site, which has not been used for over 20 years, and a small radioactive material decontamination and storage facility are located in Area II. A storage facility designed to hold PCB-contaminated material temporarily until it can be transported to an EPA-licensed disposal facility is also located in Area II. A new explosive components facility (ECF) planned for Area II will integrate many of the existing Area II activities as well as some remote testing activities currently done in other test areas.

Area III, located 8 km south of Area I, is composed of 20 test facilities, which include extensive environmental test facilities (such as sled tracks, centrifuges, and a radiant heat facility). Other facilities in Area III include an inactive paper incinerator, an inactive low-level radioactive waste disposal site, and an inactive chemical waste landfill.

Management of radioactive wastes at SNL, Albuquerque, underwent a major change in December 1988, at which time the radioactive disposal site in Area III was closed. The site is a shallow land burial site that consists of two adjoining fenced areas. Since termination of disposal operations, the site has been used for above-ground interim storage of small volumes of radioactive wastes: low-level, mixed, classified, and unclassified.

The unclassified low-level waste disposal area consists of seven trenches. Approximately one-third of the seventh (last) trench volume was filled before disposal operations ceased and it, too, was covered. The classified disposal area consists of pits that, as they were filled, were capped with cement. Thirty-five pits have been filled and capped. Two pits have been used but not capped, and two more pits were never used. Separate pits inside the classified waste disposal area were used for disposal of uranium. Two uranium pits have been filled and capped. One more pit has been used for uranium disposal, but has not been capped.

The Radioactive and Mixed Waste Management Facility (RMWMF) in Area III will serve as a central processing facility for packaging and storage of low-level and mixed wastes that may also be classified or contain accountable nuclear material. The RMWMF is expected to be operational in FY91.

The inactive chemical waste landfill is located near the southern boundary of Area III. Chemical wastes have not been disposed of here since November 7, 1985. From 1985 to 1988, the landfill location was used to temporarily store containers of chemical waste until they were shipped to offsite, EPA-permitted treatment and disposal facilities. A closure plan and post-closure permit application were submitted to the State of New Mexico in May 1988 for the no-longer-used chemical waste disposal site. A new hazardous

waste repackaging and storage complex (located south of Area I) was completed and put into operation in 1988. Currently, all SNL chemical wastes are managed in these facilities prior to offsite shipment to EPA-permitted treatment and disposal facilities.

Area IV consists of several inertial confinement fusion research and pulsed power research facilities. A large accelerator, the Particle Beam Fusion Accelerator II (PBFA-II), was completed in 1985. Gaseous tritium effluents (primarily HT) will be released in the fusion research starting in 1991. A large accelerator facility (STL) completed in 1986 houses seven pulsed power accelerators: HERMES III, RLA, TROLL, STF, SPEED, HYDRAMITE, and PROTO II. Several of these accelerators have been transferred from Area V. HERMES III was operational in 1988. Another new accelerator facility, SATURN, was completed in 1987. Minimal radioactivity was released from these facilities in 1989. A major new research facility (SDF) is under construction. During 1989, radioactive emissions from this facility were short-lived radionuclides, primarily N-13 and O-15.

Area V houses several electron beam accelerators, three research reactors in two reactor facilities, an intense gamma irradiation facility (using Co-60 and Cs-137), and a hot cell facility.

The two research reactor facilities in Area V are quite dissimilar: the Sandia Pulsed Reactor (SPR) is an unreflected, unmoderated assembly of enriched uranium; the Annular Core Research Reactor (ACRR) has an annular core of 226 fuel elements in an open water tank. Both the SPR and the ACRR air exhaust systems are equipped with particulate effluent samplers. The ACRR also has a continuous gaseous effluent monitor. The primary air activation products released from reactor operations consist of Ar-41. The reported amount of Ar-41 (which is released from both reactor areas) was computed from reactor operating parameters. The reported releases from both reactors from 1988 were very small and were not significantly different from 1987 releases. Neither the ACRR nor the SPR releases cooling water routinely.

SNL, Albuquerque, also has test areas outside the five technical areas. These areas are located south of Area III and in the canyon on the west side of the Manzano mountains. Coyote Canyon is such an area. Depleted uranium is infrequently spread over limited areas during explosive testing in these remote test areas. The areas are surveyed following each test, and contaminated materials are collected and disposed of in accordance with DOE requirements. Environmental monitoring is done as necessary. Operations in these areas are, in addition, administratively controlled to avoid uranium contamination in public areas beyond the confines of KAFB.

1.2.2 Site Description, Kauai Test Facility

The DOE/SNL Kauai Test Facility (KTF, Figure 2), is located within the US Navy Pacific Missile Range Facility (PMRF) at Barking Sands, Hawaii. The island of Kauai is a single shield volcano, with approximately 1600 km^2 total land area.

The total population of Kauai Island is 38,856 (1980 census). The largest towns are Kapaa (4,467), Lihue (4,000), Kekaha (3,260), Hanamaulu (3,227), Kalaheo (2,500), Wailua (1,587), Waimea (1,569), Koloa (1,457), and Hanapepe (1,417).

Approximately 200 military personnel are stationed at PMRF, excluding National Guard units. SNL staffing at KTF ranges from 10 to 70 persons, depending on mission schedules.

The nearest populated community is the town of Kekaha (3,260 persons), 12 km to the south. An extension of State Highway 50 skirts PMRF on the mountain side leading to Polihale State Park, which extends 5,180 m north of the PMRF boundary.

PMRF occupies the western coastal edge of the Mana plain, within the Royal Ahu Pua'a of Waimea in the District of Kona. The installation is on state-owned land that has been conditionally transferred to the federal government under Hawaii Governors' Executive Orders 887 and 945. It extends for about 13 km along the ocean, with KTF at its north end. The US Navy administers all land within PMRF. The KTF area is currently assigned to DOE for SNL occupancy pursuant to the Interservice Support Agreement, Pacific Missile Range Facility/Department of Energy, dated October 13, 1987.

Climate and Meteorology

The PMRF lies in the rain shadow of Mount Kawaikini and Mount Waialeale. This part of the island is sheltered from the predominant northeast tradewinds, making it the driest portion of Kauai. Average rainfall, most of which occurs between October and April, is 51 cm per year. Under normal conditions, winds are generally light and variable. Abnormal conditions can result in gusty winds in excess of 15 m/s from any direction. The average temperature is +28°C, with a minimum average of +18°C and a high average of +30°C.

Geology

The entire PMRF lies within a sand dune and beach area along the coastal margin of the Mana plain, a former marshland of the west-southwest coast of Kauai. Very small remnants of the original Mana marsh still exist. The US Navy facility is situated on the peripheral extension of the Mana plain. The Mana plain begins, along its eastern edge, at the base of old sea cliffs

approximately 3 km inland. Elevation at the base of the cliff is approximately 15 m above sea level (ASL). The plain is flat, with elevations that range from 3 m to 5 m ASL. The coastal sand area encounters the terrestrial alluvium deposition approximately 1 km inland. Dunes within the facility are usually less than 6 m ASL. However, dunes in the northern portion of the Barking Sands range from 16 m to 30 m ASL.

On the coastal side of the plain, the PMRF stretches along the beach for approximately 12 km, from Kokole Point in the south, northward to Polihale State Park. Maximum width of the facility is approximately 1 km in the Nohili and Kokole areas, shrinking to a minimum of 0.3 km toward the central portion of the base. The total area of the PMRF is about 8 km^2, which constitutes approximately 20 percent of the surface area of the Mana plain.

KTF also occupies a small area directly south-southwest of the Barking Sands dunes. It is situated in a relatively flat, open, park-like setting with a northeast to southwest orientation. Elevations within this area range from 3 m to 6 m ASL.

The lower inland slopes of the dunes located north-northeast of the KTF are stabilized by dense kiawe vegetation. This growth marks the northern and the southwestern boundaries of the installation. North Nohili Road forms the eastern and northeastern boundaries of the property.

An additional launch facility is located on the southern end of PMRF, north of Kokole Point. This facility is situated on an open flat directly above a bench ledge. Ground cover in both areas is composed of a mixture of Bermuda grass; Portulaca pilosa, a plant with fleshy stems and leaves; and buffelgrass.

Hydrology

The site has no integrated surface drainage. The sand is so permeable and its moisture-holding capacity so low that no drainage pattern has become established on the surface; precipitation simply sinks into the sand and disappears.

The three geological formations (bedrock, alluvium, and dunes) constitute hydraulically connected aquifers. The basement volcanics are highly permeable, containing brackish water floating in seawater. The overlying sediments act as a caprock because of their low permeability; they are saturated, but are nonexploitable as an aquifer because of unfavorable hydraulic characteristics.

The dune sand aquifer, on which the PMRF lies, has a moderate hydraulic conductivity and a reasonable porosity. It consists of a lens of brackish groundwater floating on seawater and is recharged by storm and rainfall and by seepage from the underlying sediments. The only recorded attempt to exploit this groundwater is that of a well drilled for the Navy in 1974, approximately

8 km south of KTF. It was dug to a total depth of 13 m, encountering only fine sand and coral gravel. Tested at 20 L/s, it initially yielded water having 2,800 mg/L chloride, which is too brackish for plants. This well is not used.

Biology

Much of the vegetation at PMRF is nonnative, having been introduced to Kauai by recent (post-Cook exploration) settlers. Vegetation at the installation is characterized by sparse groundcover and semi-arid conditions. The predominant groundcover is a mixture of kiawe and koa haole scrub. These two plant species are present in equal number; however, they are also known to occur as pure stands. In addition, various herb and grass species are plentiful, including Guinea grass, lantana, and wild basil. In 1985, a potential candidate for endangered-species designation, Ophioglossum concinnum, was discovered at PMRF. This small perennial fern was known to exist on the islands of Maui, Lanai, Molokai, and Hawaii, but had not been reported in Kauai. Colonies of this plant species were observed by the archaeological survey team in the southwestern portion of KTF during the course of their studies.

Occupancy

KTF is a rocket preparation and launch facility. Activities include:

* Launching of experimental rockets for observation by the Air Force Maui Optical Station located on Mount Haleakala

* Researching and developing technology relating to high velocity exit and reentry vehicles

* Conducting suborbital coexperiments with launches from Vandenberg Air Force Base in California

* Performing ICBM-type launch simulations targeted to areas in the Kwajalein Atoll region

* Conducting scientific experiments on phenomena occurring in the upper atmosphere over the mid-Pacific

* Implementing high-velocity water impact and underwater trajectory experiments in conjunction with US Navy instrumentation capabilities.

KTF also features extensive instrumentation, control, and telemetry receiving and recording capabilities, as well as communication system access to worldwide facilities of the United States Department of Defense (DoD). The facility provides a high-quality, integrated environment for conducting a wide range of test operations that support R&D testing of materials, components, and advanced reentry vehicle technologies. Experiments are conducted in the upper atmosphere, the ionosphere, and in space.

The majority of the construction at KTF occurred in 1962. The administrative area is located in a fenced compound near the north Nohili access road from the PMRF. Within the fenced compound, a number of trailers and vans are interconnected, with a network of concrete docks and covered walkways. The majority of these temporary facilities are used during operational periods to support field staff at KTF. In the nonoperational periods, they are in standby condition, with only dehumidifiers in operation. In addition, a small number of permanent buildings are in use year-round to support and maintain KTF operations.

During rocket operations at KTF, four instrumentation trailers are used for office/lab and payload support functions. They provide ground power switching, fireset arming, and control and monitoring of in-flight payload operations.

A number of other trailers are used for administrative support and storage of radio equipment, supplies, drawing files, etc. Most of these trailers are scheduled to be replaced in the future with an administration building. The remainder of the trailers in the compound are used primarily as office areas for personnel temporarily assigned.

The KTF launcher field was originally designed to accommodate 40 launch pads, but only 15 were constructed. Of these, 12 are currently inactive, with the launchers removed to simplify facility maintenance. Since the original plan, two additional launch pads have been constructed: Pad 41 at Kokole Point and Pad 42 for vertically launched STARS (Strategic Target System) missions. The launcher field has a number of permanent facilities used to support the rocket operations.

1.2.3 Site Description, Tonopah Test Range

The Tonopah Test Range (TTR, Figure 3) is located about 225 km northwest of Las Vegas, Nevada, and covers 1,600 km^2 within the boundaries of the Nellis Air Force Base Range Complex. It is bordered on the east, south, and west by the Range Complex and on the north by sparsely populated public land administered by the Bureau of Land Management and the US Forest Service. The nearest population center is Goldfield (population 402), about 40 km west of TTR. The next closest populated area, 48 km to the northwest, is Tonopah, with a population of 4,500. Land at the site is owned by the Bureau of Land Management and withdrawn from public use by the Air Force. DOE maintains a use agreement with the Air Force that is concurrent with the terms of withdrawal.

Climate and Meterology

TTR lies within the basin-and-range province, which as a whole is the driest in the US. In many parts, annual precipitation is less than 25 cm. Perennial streams are scarce, and evaporation rates are high.

TTR itself is a region of low precipitation and moderate winds. Daily average temperatures range from -2°C in January to +23°C in July; extremes during the representative period 1961 through 1967 were -31°C and +39°C. The bulk of precipitation comes in the late spring and summer in thunderstorms and averages 13 cm a year (including 48 cm of snow). On average, measurable precipitation occurs 37 days a year, and fog, seven days. Winds are bimodal, from the west-northwest and from the south-southeast. Dust storms are common in spring and dust devils in summer.

Geology

TTR lies east of a zone of transcurrent faulting and shear, called the Walker Lane, to the northwest and the Las Vegas Valley shear zone to the southeast. The exact nature and location of the shear zone near TTR are problematical.

Rocks of Precambrian age with an aggregate thickness of over 2,440 m are overlain by about 6,100 m of Paleozoic sedimentary and carbonate rocks. A thrust fault system of Mesozoic age causes Mesozoic rocks to be missing in the section, except for small exposures of granite in the Cactus Range and in the southern Kawich Range south-southeast of TTR. Above the resultant unconformity lie about 6,100 m of Tertiary rocks, consisting mostly of widespread ash-flow tuffs that range in age from 7 to 27 million years, thick piles of variegated lavas, and several sequences of interbedded tuffs and sedimentary rocks. Above this, over half of TTR is blanketed by alluvium and colluvium of Quaternary and Tertiary age. The alluvial material is thickest in the major basins, such as Cactus Flat, but the actual thicknesses there are unknown.

The western US is a seismically active region. The Nevada seismic zone has experienced some of the largest earthquakes on record near where the zone crosses the well-known San Andreas fault in California. Shocks along the Nevada portion of the zone have been smaller.

Hydrology

All of the streams in and near TTR are intermittent and end in closed basins. TTR is almost coincident with the Cactus Flat drainage area, although in the northwest it laps over into the Stone Cabin Valley drainage area, in the west into the Stonewall Flat drainage area, and in the southeast into the Gold Flat drainage area.

The working areas of TTR cover about 1,000 km^2. Along the axis of the valley, at elevations of a little under 1,650 m, lie a string of playas (dry lake beds), conspicuous by their light-colored surface sediments, high content of soluble minerals, and lack of vegetation. Except for a few days each year after rain in the nearby mountains, these playas are dry; during the Pleistocene glacial period a lake was here, the shorelines of which can still be faintly seen.

Three springs lie within TTR: Cactus and Antelope Springs in the central and southern Cactus Range and Silverbow Springs in the northeastern corner of TTR, in the northern Kawich Range. Water from these springs does not travel far; it disappears rapidly through evaporation and infiltration, and its effect on the landscape is purely local. Water used in TTR facilities comes from wells tapping the underlying groundwater in alluvium derived from the surrounding mountains. Depth to water varies from 27 to 46 m.

Biology

Generally, the vegetational communities within TTR may be characterized as salt desert shrub, northern desert shrub, and pinon-juniper woodland. With each vegetational community is associated a characteristic faunal assemblage. Only a few species, such as the coyote and the rattlesnake, occur in all local vegetational communities.

In the salt desert shrub community are many rodents, kit foxes, coyotes, badgers, jackrabbits, lizards, and rattlesnakes. Common birds are the horned lark, mourning dove, sage thrasher, and Brewer's and vesper sparrows.

In the northern desert shrub is a somewhat different set of rodents than in the salt desert shrub: lizards, snakes, and some different species of birds, including the golden eagle, safe grouse, and raven.

In the pinon-juniper woodland of the Kawich Range, in the northeast corner of TTR, are also cottontail and mule deer. This woodland has the greatest variety of wildlife of any vegetational associations to be found on TTR.

Between 4,000 and 6,000 feral horses, which have escaped the close domestic management of man, roam freely throughout TTR. Throughout much of Nevada and the western US, these animals are still escaping into the wild; thus their populations are a mixture of animals that have been long removed from man's management and those that are essentially domestic but free grazing. The horses on TTR are confined by fences, which were installed in 1978 to prevent cattle from entering the range. Their exposure to range activities has apparently had little effect on their population or grazing habits, but their increasing population may be of future concern. Because TTR employees frequently drive on the range at night, the danger of vehicle collisions with the horses is significant.

Occupancy

The prime mission of TTR is to provide R&D test support for DOE nuclear ordnance programs. Test support for other government agencies is also provided on a reimbursable, noninterference basis. SNL activity at TTR includes air drops, artillery projectile firings, ground-launched rockets (both high- and low-altitude), air-launched rockets, explosion effects tests, earth penetrator tests, cruise missile flights, and many miscellaneous activities

requiring a remote range for safety or security reasons. TTR instrumentation includes tracking radars, optical tracking and recording instruments, telemetry receiving and recording equipment, and extensive radio and hardwire communications systems.

SNL began operation at TTR in 1957 after similar facilities at Salton Sea, California, and Yucca Flats, Nevada, became inadequate. TTR was previously used as a bombing range by the US Air Force. Several DoD agencies have also established operations at TTR. Personnel in support of SNL operations usually number about 200. SNL personnel are primarily located at the Control Point (Area Three), which is the center of operations for range and test activities.

The environmental effects of operating TTR are mainly modification of existing desert terrain to allow operations such as road and runway construction, preparation of instrumentation sites, and technical support areas. Environmental effects of testing activities there are usually noise (from aircraft, rockets, or guns) and scars in the terrain resulting from impact and recovery of test units.

Area Three sewage waste consists primarily of sanitary waste disposal through a sanitary sewer system terminating in the Air Force lagoon. Some of the remote locations' sewage waste is still disposed of in septic tanks and associated drain fields.

Some test units contain material potentially hazardous to humans and the environment, such as beryllium, uranium, or plutonium. Test procedures are designed to minimize the potential of materials being released to the atmosphere. Trained personnel with the required safety equipment are available to monitor and mitigate any unintentional release.

A series of tests called Roller Coaster were conducted on TTR in 1963 to study plutonium (principally Pu-239) dispersal from accidental nonnuclear explosions of plutonium-bearing weapons. These tests resulted in three contaminated areas on TTR (Clean Slate 1, 2, and 3) and a contaminated area on the Nellis Range Complex (Double Track). These areas are fenced and posted to restrict access.

1.3 Laboratory Organization

The organizational structure for SNL, as depicted in Figure 4, is typical of that found in many high technology industrial companies, and resembles the structure of AT&T Bell Laboratories. The ES&H Directorate, Organization 3200, reports functionally to the Executive Vice President for Administration. The temporary management structure set in place for SNL's ES&H Improvement and Compliance initiative is as shown in Figure 5; transition to a permanent structure is anticipated in late 1991.

1.4 Methodology

The Pre-Tiger Team Self-Assessment (PTTSA) of SNL was conducted using the guidance provided by the Tiger Team Guidance Manual, February 1990; the July 31, 1990, memorandum from Admiral Watkins, "Guidance on Environment, Safety, and Health (ES&H) Self-Assessment"; and DOE Order 5482.1B, Environment, Safety, and Health Appraisal Program.

The self-assessment process was performed by a working group of 19 middle managers (Department Managers) constituting an organizational cross section of SNL, Albuquerque, with responsibilities in TTR and KTF, as well. The project plan developed by this Self-Assessment Working Group (SAWG) addressed seven major tasks, including training, project organization, data gathering, identification of findings, determination of key findings, determination of root causes, and preparation of action plans.

SAWG members participated in a one-week self-assessment training course based upon the Institute of Nuclear Power Operations (INPO) approach applied to nuclear power generating facilities. Consultants who had supported the SNL, Livermore, PTTSA provided information and documentation on recommended procedures. The SNL, Livermore, PTTSA project manager provided the SAWG with valuable lessons-learned feedback and suggested self-assessment procedural improvements based upon the May 1990 Tiger Team appraisal of Livermore. As further preparation for undertaking the ES&H self-assessment process (since few members of the group had any specific ES&H experience or expertise), the SAWG reviewed a variety of applicable source material (such as the Performance Objectives and Criteria for Technical Safety Appraisals (April 1990); Environmental Audit Manuals Volume I, II, III (January 1990); ES&H and QA Management Appraisal Program Development, Attachment 1 (September 1989); and specific DOE orders and OSHA standards.

The self-assessment process that SNL, Albuquerque, was to follow had largely been established prior to the formation of the SAWG. The ES&H Program Manager had already approved the survey approach (described later) based upon performance objectives/criteria and had created a working group to prepare forms and associated databases. After reviewing this process, the SAWG prepared a project plan (Appendix B) to more specifically define roles and responsibilities, tasks, and schedule; this plan was approved by the ES&H Program Manager.

The principal mechanism used by the SAWG to gather data relevant to the SNL (including Albuquerque, TTR, and KTF) ES&H state of compliance employed survey questionnaires based on performance objectives extracted from the previously cited source material. A survey form, called a findings input sheet (FIS), was developed for each performance objective in the safety and health, environmental, and management appraisal program areas. (Appendix C lists all abbreviations and acronyms; Appendix D lists all performance objectives.) As an aid to better understand the performance objectives, each FIS also included a listing of the applicable performance criteria. Based on their knowledge of

activities within each SNL organizational vice presidency, SAWG members generated an FIS distribution intended to sample relevant organizations, programs, and facilities for compliance. A total of 3,258 FIS responses were collected and entered into a database. Self-assessment data were also gathered through interviews with personnel selected from all management levels, selected reviews of operating procedures and documentation, and walk-throughs of selected facilities. More information on these activities is presented later in this report.

As the first step in evaluating this collection of self-assessment data, information was sorted according to ES&H program areas, 43 in total; functional groups of SAWG members were established to concentrate on specific program areas in order to derive significant findings (roughly commensurate with "Concerns" as used in Tiger Team documentation). These significant findings are presented in Chapters 3, 4, and 5 of this report.

Following the definition of significant findings, a SAWG subcommittee distilled these findings into a comprehensive set of key findings that encompasses all programs and program areas, summarizing the state of compliance throughout the corporation. These key findings are presented in Chapter 2 of this report.

With key findings in hand, another SAWG subcommittee pursued a root cause analysis of this collection of findings. This process entailed a structured, exhaustive questioning of "why?" aimed at each key finding until the most basic, fundamental cause was determined. The structure addressed the programmatic (physical) root cause, the management action, the management motivation, and finally the philosophical issue. Once the root cause list was determined, it was compared to those from previous assessments at SNL, Albuquerque, SNL, Livermore, and other DOE facilities. Finally, each key finding and significant finding was reviewed to ensure that, if the root causes were corrected, the significant findings and key findings would not recur.

At every step in this methodology, the SAWG checked its results against the SNL, Livermore, Tiger Team process and conclusions to assure that lessons learned were not overlooked or ignored. For the same reason, Tiger Team results from appraisals of other DOE facilities were also analyzed regarding their applicability to the SNL self-assessment.

The final, and most important, task pursued by the SAWG was defining and implementing an Action Plan methodology. The first step resulted in identifying those actions which could, and should, be defined and executed by specific line organizations. (These, in fact, had already been proposed by the line as part of the FIS response process.)

In order to address significant findings, key findings, and root causes, it is necessary to define a process by which they can be resolved; the characteristics of such a process should include:

* Identification of the issues or problems requiring resolution
* Statement of the general requirements of the solution
* Consolidation of proposed action plans into logical groupings for solution
* Categorization according to severity
* Prioritization within category
* Provision of a basis for long-range planning and issues management
* Documentation of status of the proposed action
* Maintenance of traceability of action to the original problem or issue

The process adopted by the SAWG partitions the action plan activity into three separate documents: (1) the PTTSA Report, (2) the Action Plan Report, and (3) the Development and Implementation Plans.

The PTTSA report assesses the status of compliance with DOE orders and state and federal laws using the TSA performance objectives and criteria, the Environmental Audit Manual, and the Management Appraisal Procedures for ES&H and QA Activities. This report documents a one-time assessment for which findings are generated, and when pertinent, required actions are identified as Action Plan Requirements (APRs). The requirement is numbered to refer to the finding(s). The PTTSA report is a one-time document that will not be updated as progress is made.

The Action Plan Report is a living document that facilitates management of the corrective actions necessary to achieve a given level of performance. It will be used to rank by priority the tasks as an aid in determining which tasks will be performed in a given year. As other assessments are performed and other required actions are identified, they will be factors for modification of the Action Plan Report. As new DOE orders are issued and laws are changed, they too can be used as input to this Action Plan Report.

When an action plan is approved for development and implementation, a project manager is selected. He or she selects an appropriate team and they develop a detailed Development and Implementation Plan. The plan describes the strategy for resolution of the issue and begins the process of developing the program (or whatever is required for the resolution) in accordance with the SNL project management process.

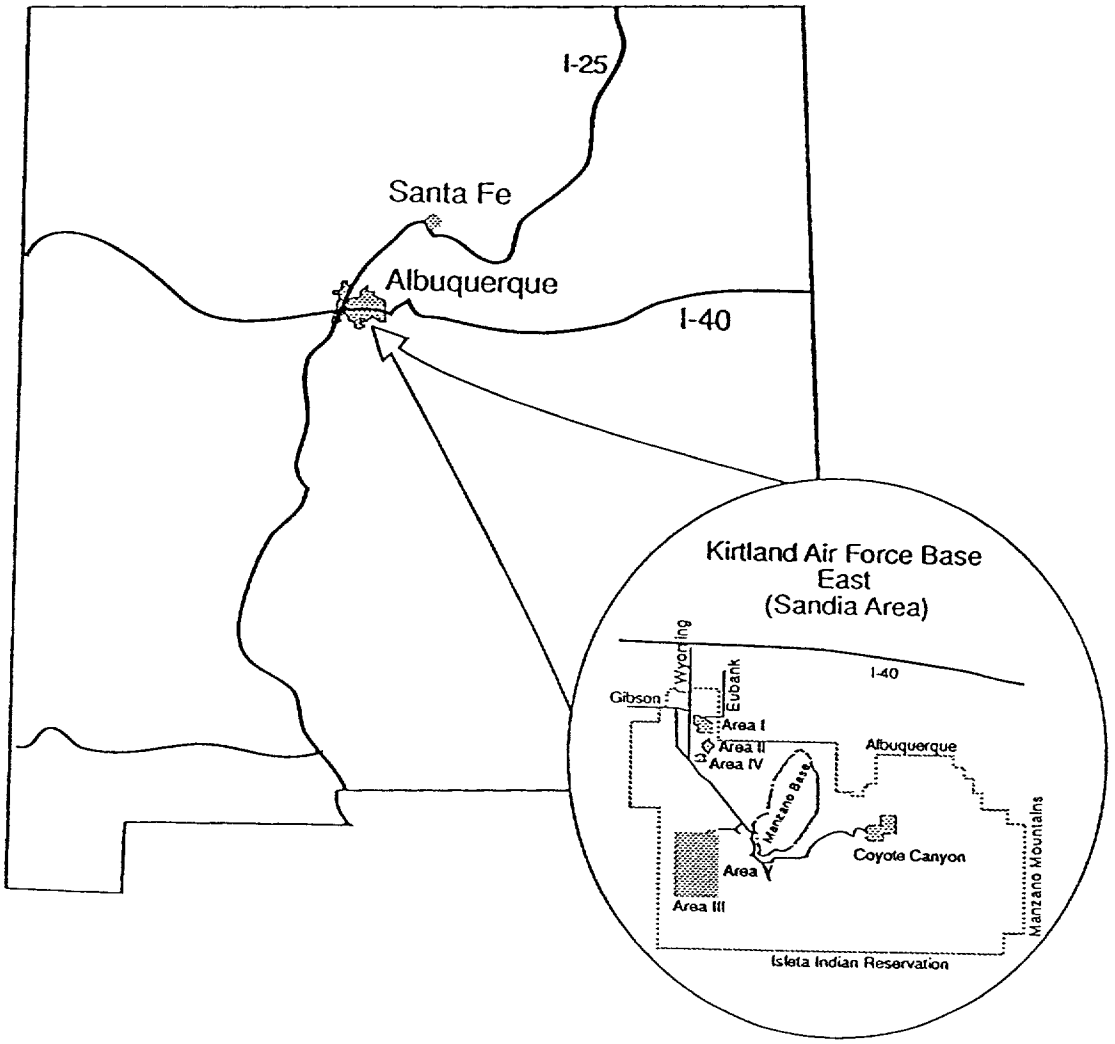


Figure 1. SNL, Albuquerque

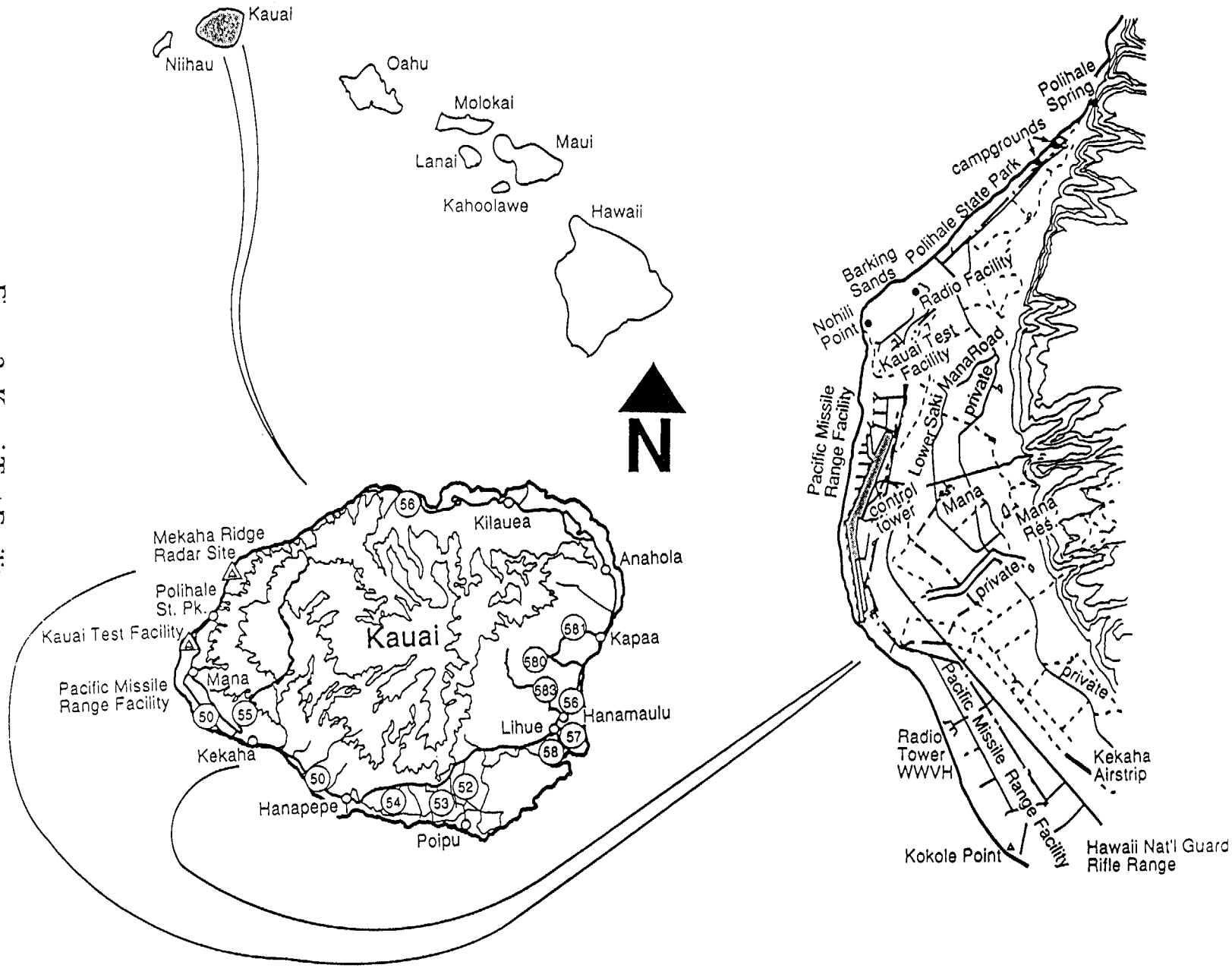


Figure 2. Kauai Test Facility

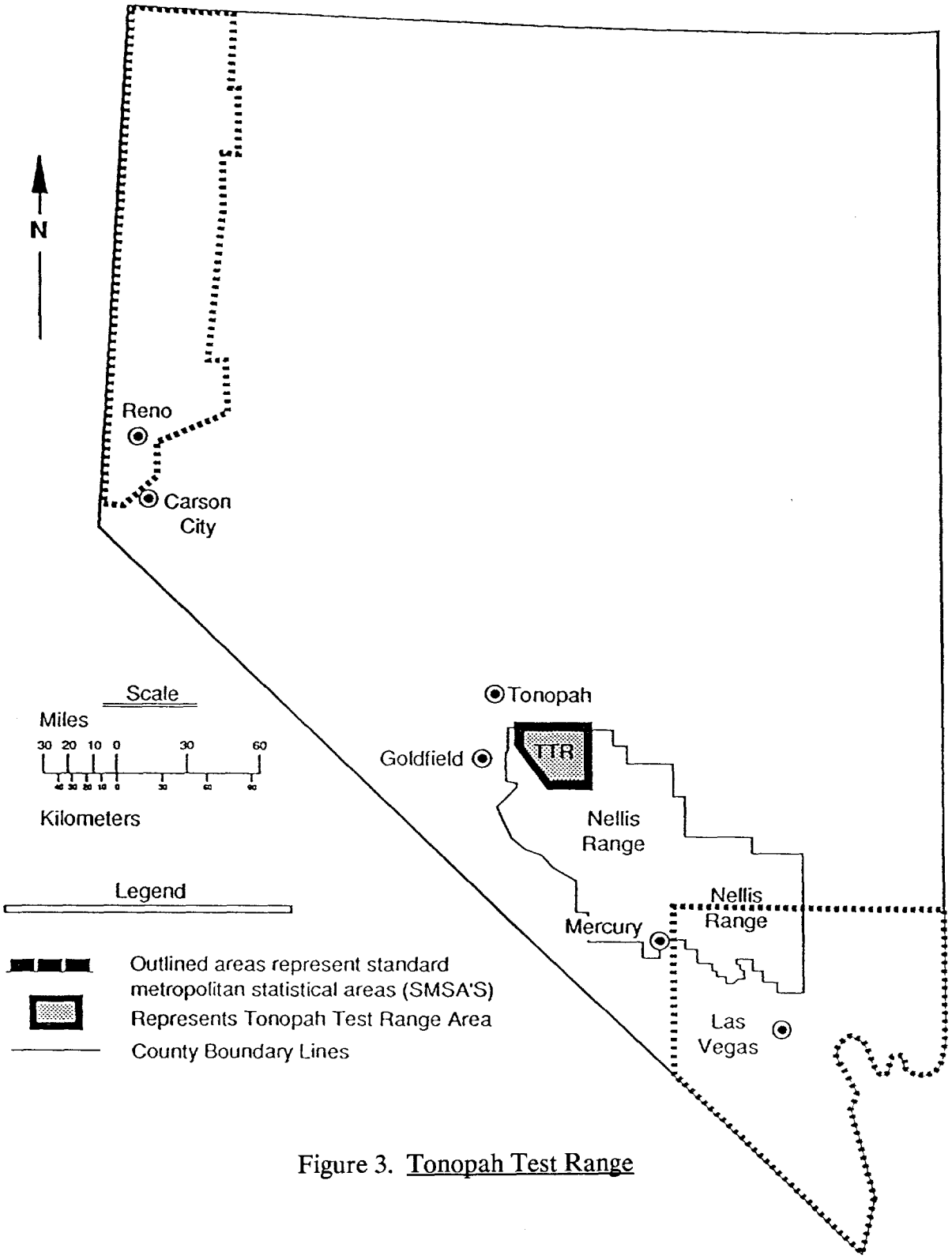


Figure 3. Tonopah Test Range

Sandia Management Council

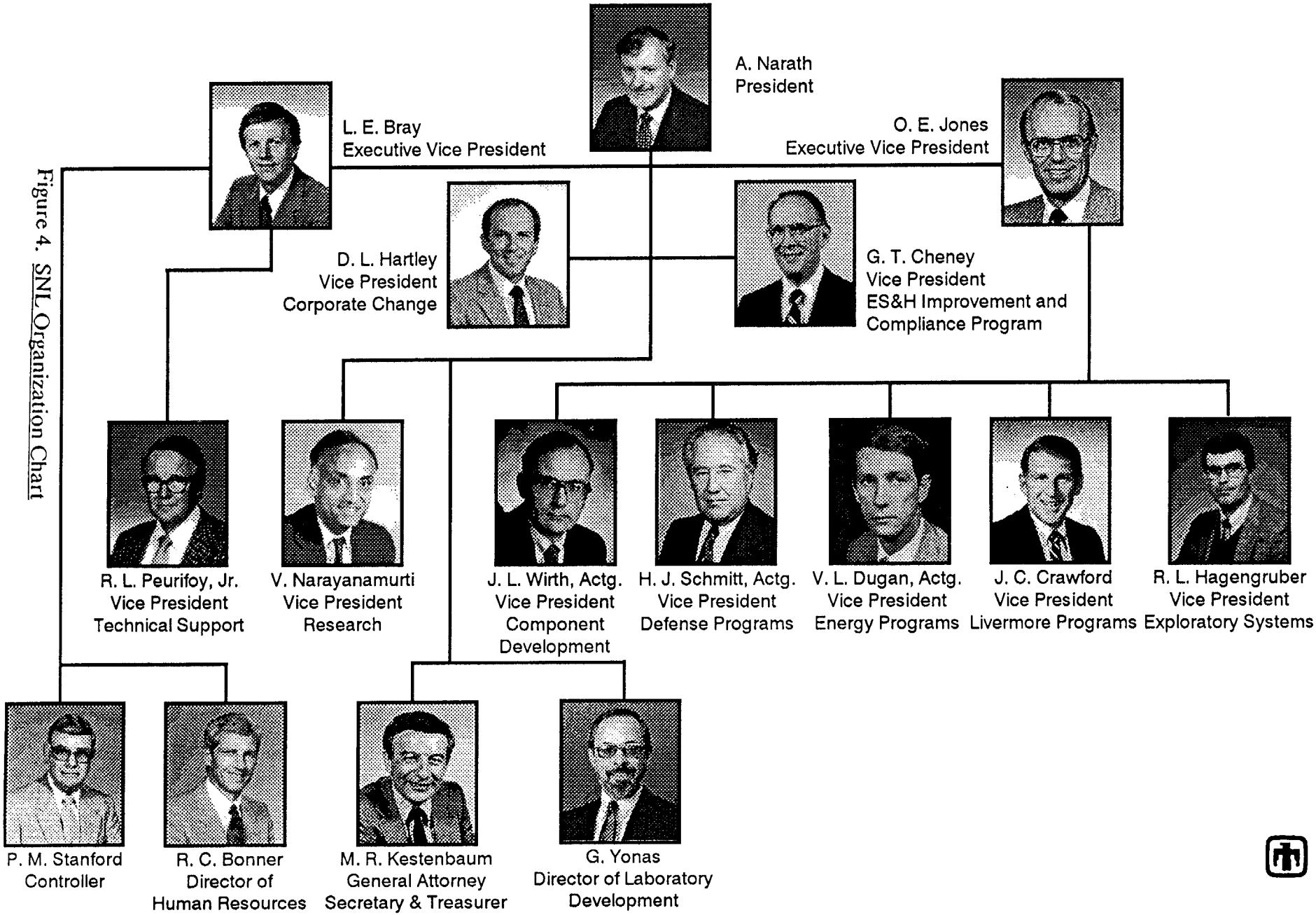


Figure 4. SNL Organization Chart

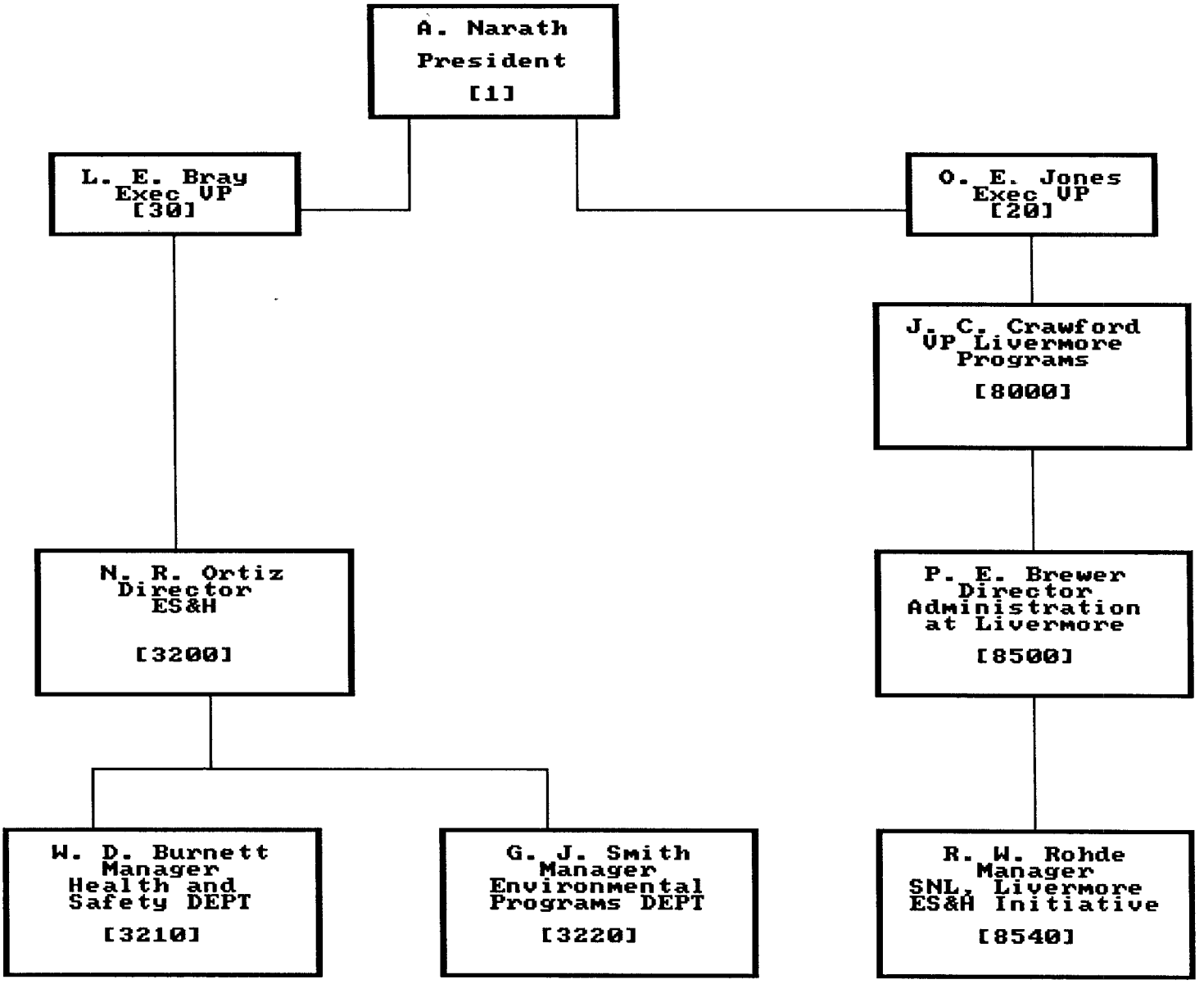


Figure 5. ES&H Structure, July 1990

Chapter 2: Root Causes, Key Findings

Chapter 2

Root Causes and Key Findings

2. Root Causes and Key Findings

2.1 Root Causes and Action Plan Requirements

2.1.1 Overview

The root causes discussed below were determined from analyzing the findings identified in this self-assessment. They resulted from an analysis that is best described as "an exhaustive asking of 'why?'" That is, each finding was subjected to this "why" process, resulting in a new answer that was, in turn, subjected to the questioning process. This procedure was continued until the most basic, fundamental cause was identified.

Three root causes were identified. Even though they are interrelated, they represent deficiencies sufficiently different to justify their separate citation. The lack of a perceived problem (Root Cause 1), along with a lack of understanding of the requirements (Root Cause 2), and the resistance to formality of operations (Root Cause 3), have led to a culture where leadership action does not anticipate, adequately respond to, nor implement environment, safety, and health (ES&H) compliance programs in a uniform or consistent fashion.

2.1.2 Root Cause R1 [Reference APR-RC-01]

A general belief exists that "there is no problem."

Finding Description

Before the SNL, Livermore, Tiger Team assessment, SNL management and most employees did not perceive the Laboratories as having an ES&H problem. This perception forms the basis for all past ES&H operational practices.

Discussion

Over the almost 43 years of operation of the Laboratories by Sandia Corporation, timely, high-quality, within-budget project performance has been the primary goal. This focus on project performance (with full consideration of perceived safety problems) has relegated other concerns and requirements (e.g., Occupational Safety and Health Administration (OSHA) compliance, waste disposal) to a secondary status. These secondary concerns have been addressed only when they interfered with project performance. As a consequence, matters that have not interfered with project performance have been considered under control, or "not part of the problem."

Most SNL employees continue to believe that SNL has a very low accidental death rate and a lost-time-to-injury rate that compares favorably with other industry. The basis of this perception is the fact that SNL has an accident rate

that is below the national average of general industry. This perception is also supported by a reporting system that has not identified numerous small incidents. Moreover, each incident has been assessed as an isolated special case and therefore has provided no insight into the general conditions throughout the Laboratories. This false sense of success has been exacerbated by comparing our performance to general industry as opposed to other R&D organizations. In fact, the SNL accident rate is significant. When deaths, permanent injury, and lost and restricted workdays are combined into a single statistic, SNL is rated 28th of 31 Department of Energy (DOE) research contractors in FY90. As another example, for the period 1985-1989, SNL is ranked 21st of 31 in lost workdays (Reference DOE, Occupational Injury and Property Damage Summary, January through June 1990).

SNL employees also believe that operation of the Laboratories has resulted in no significant abuse to the environment. Operations hazardous to the environment have been considered few and well-defined. Those involving the use of life-threatening materials, such as toxic gases, and materials with extremely high radioactive content, have been very carefully scrutinized. However, this very scrutiny has diverted attention away from the handling of hazardous materials that are not immediately life-threatening. Since these other hazardous materials do not present an immediate hazard to life, comparable care in their disposal and handling has not been undertaken. Not surprisingly, the lack of attention in this area and the preoccupation with project management success has led to a misunderstanding of the actual situation, which indeed reveals lack of attention to environmental issues.

These beliefs in superior operation and compliance by SNL led management and employees to believe no change in ES&H practice was warranted.

Action Plan Requirement

APR-RC-01. Measures that adequately represent the status of SNL ES&H performance should be developed. The resulting data should be analyzed to identify trends and to determine the efficacy of our remedial programs. The results of the PTTSA and the continuing self-assessment should be analyzed and compared with those of peer laboratories. A process to ensure that management is aware of these results and acts to resolve problems should be put into place.

2.1.3 Root Cause R2 [Reference APR-RC-02]

Management and staff lack understanding of ES&H rules and regulations and their applicability to SNL.

Finding Description

SNL management and staff have minimal training in and understanding of the various ES&H rules and regulations and of DOE orders. In addition, they do not understand if or how to apply these regulations to make SNL a safer, healthier, and more environmentally sound operation.

Discussion

SNL has had an employee safety and health program since its inception. This program was implemented at the division level and, thus, there has been little uniformity of action. Such things as division safety meetings, annual safety reviews, periodic Safety, Health, and Environmental Appraisal Committee (SHEAC) inspections, and fire drills have been thought sufficient to ensure a safe and healthy workplace. In fact, the SHEAC inspections have been infrequent and noncomprehensive, and the safety engineering, industrial hygiene, and environmental protection groups that have reviewed and approved the "paperwork" have had limited contact with the line organizations. Most SNL operations have been thought to have no potential for environmental impact and, thus, little or no action has been taken in this area. The action taken was to delegate responsibilities downward, with no follow-up on measuring progress.

The majority of SNL management has not read or participated in a discussion of the DOE orders that outline the requirements for ES&H compliance. For the most part, SNL management and employees have thought that rules and regulations did not apply to their operations; thus, the rules and regulations have never been referenced or included in the policies. The requirements for compliance with OSHA and various environmental acts have not been summarized in a manner allowing management or employees to digest them and act on them. The recent increased awareness of the "problem" has resulted in reactive behavior, seeking conformance at any cost as opposed to a measured response leading to a prioritized, workable, and affordable solution.

Action Plan Requirement

APR-RC-02. Management should be thoroughly informed and educated about the DOE orders, laws, and regulations that govern SNL operations. Management should take an active role in ensuring that the programs and procedures that are being defined are the appropriate solutions to meet the ES&H requirements set forth in the orders, laws, and regulations. Employees should be educated to ensure full understanding of their ES&H responsibilities. The Sandia Laboratories Instructions (SLIs) should be modified so that these new responsibilities are institutionalized as part of SNL operating policy.

2.1.4 Root Cause R3 [Reference APR-RC-03]

Management and staff believe the ES&H compliance requirements and implementation process are incompatible with the current SNL culture.

Finding Description

SNL management has a philosophy of hiring good people and trusting them to perform their work safely and without insult to the environment. This "hands-off" management style is not compatible with the formality of operations required for ES&H compliance. To ensure ES&H compliance, this management style must be augmented by procedures with characteristics of greater formality and better definition of responsibilities.

Discussion

The R&D creative process is viewed by SNL management as significantly different from nuclear power reactor operations. Hence, management has believed that little attention need be given to uniform implementation of formal operations. In fact, this philosophy has served SNL quite well for many years, which has led to reinforcement of the value of this behavior. The corporate culture has historically rewarded employees who demonstrate initiative and judgment, particularly those who are willing to take risks to achieve success. The recent initiative at SNL to empower the employees is viewed as authorizing employees to use individual judgment in conducting their activities. There is a widespread feeling that such empowerment and the current culture are not compatible with the new approach to ES&H compliance. Some local ES&H compliance groups have been established, but no uniform program exists throughout the Laboratories. The Quality Assurance program in the nonweapon areas has not been implemented with any consistency because it is thought to be too cumbersome. The Weapon Quality Assurance program focuses on weapon reliability and safety as opposed to the ES&H concerns inherent in testing and manufacturing. An overall strategy that incorporates goals, priorities, and tracking systems has not been developed for implementation. Lack of "ownership" and feelings that ES&H is someone else's responsibility still exist within SNL.

Action Plan Requirement

APR-RC-03. A major effort should be undertaken to involve SNL organizations in the development of ES&H programs before they are finalized. These programs should be implemented by using a graded approach to ensure a clear linkage between compliance and a safe, healthy workplace with activities that do not abuse the environment. A vision of how SNL will operate in this new environment of formal operations should be developed and communicated to all employees.

2.2 Key Findings and Action Plan Requirements

2.2.1 Overview

The key findings represent broad ES&H issues. Many arose from deficiencies observed in several program areas; others are underlying issues that became apparent through overall review of findings and source material.

The key findings point to serious shortcomings in SNL management of ES&H. Management shortcomings are not the focus of the findings; taken together, however, they are strong evidence of a historical lack of management attention or concern. The present system is not responsive to requirements. Self-assessments have not been effective. An informal management style has led to inadequate control of operations and maintenance. SNL employees and contractors do not fully comply with OSHA. Quality assurance has not been applied to ES&H. Management systems do not communicate requirements clearly or ensure adequate training for employees or contractors. Facilities support has not been adequate to correct deficiencies.

In the environmental area, key findings indicate that the line has an inadequate understanding of the consequences of environmental contamination, that there are inadequate resources for the environmental protection organization to meet SNL and external customer needs, that documentation is inadequate, and that performance assessments are inadequate to reduce hazardous materials use and waste generation.

The action plan requirements to address key findings require SNL to undertake a major effort to develop a management system that will ensure sustained compliance with ES&H requirements.

2.2.2 Key Findings

Finding KF-01 [Reference APR-KF-01]

The present SNL ES&H program is incomplete and does not ensure that all ES&H requirements are properly interpreted and implemented in a consistent and auditable manner.

Discussion

SNL does not have a consistent, hierarchical structure of policies, programs, and procedures to ensure uniform rigorous compliance with ES&H requirements throughout the Laboratories. The lack of a guiding corporate management system has resulted in fragmented and often ineffective efforts to achieve compliance. A comprehensive ES&H management system is under development, but it is yet to be proved and is not well understood by line organizations.

Similar findings were reported in environment (ENV), organization (OR), management systems (MY), and almost all program areas in safety and health (S&H).

The SNL, Livermore, Tiger Team reported several similar key findings. These included lack of sitewide ES&H policies, lack of clear ES&H responsibilities and authorities, lack of resources, lack of management structure, inadequate leadership, and ambiguous roles and interrelationships.

Action Plan Requirement

APR-KF-01. SNL must develop a comprehensive management system that ensures all current and future ES&H requirements are properly interpreted and fully implemented. This system should include provisions for quality assurance, performance tracking, lessons learned, and determination and remediation of root causes. Line organizations should participate in development of priorities and programs. The system should go beyond simple compliance and foster best management practices and modern quality concepts.

Finding KF-02 [Reference APR-KF-02]

The current self-assessment process, which is based on VP SHEACs and specialized safety committees (e.g., reactors, explosives), has not been effective in measuring the status of ES&H compliance or in identifying and eliminating deficiencies and associated root causes.

Discussion

SNL is not conducting self-appraisals with the scope and thoroughness required by DOE Order 5482.1B, Environment, Safety and Health Appraisal Program and Secretary Watkins' July 31, 1990, memorandum, "Guidance on Environment, Safety, and Health Self-Assessment." The SHEACs basically perform material inspections, and are not well trained in ES&H requirements or assessment techniques. Unusual Occurrence Reports and SHEAC appraisal reports show that incidents and deficiencies are often treated symptomatically and that root cause analysis is usually superficial. There are no ES&H metrics, and safety data are not widely distributed. SNL safety statistics rank near the bottom (28th out of 31) for research contractors tracked by the DOE.

A long-term self-assessment program is being developed in parallel with the pre-Tiger Team self-assessment, but this program is not yet effective.

Similar findings were reported in Environment (ENV), Management Systems (MY), and Facilities Safety Review (FR).

The Tiger Team similarly concluded that SNL, Livermore, did not have an effective, comprehensive internal ES&H appraisal system meeting the requirements of DOE Order 5482.1B.

Action Plan Requirement

APR-KF-02. SNL must develop and implement a program for self-assessment meeting the requirements of DOE Order 5482.1B. The DOE order describes a system of internal, functional, and management appraisals from the perspective of DOE Headquarters and consequently needs some interpretation for application to SNL. It requires a graded program of appraisals with depth and frequency matched to the hazards and risks associated with an activity. "Self-assessment" must include assessments by qualified personnel who are functionally independent of the activity being appraised.

In moving toward industry best practices, the new system should incorporate assessment methodology developed by Institute of Nuclear Power Operations (INPO), which includes observations of processes in action and interviews of personnel across programs.

Finding KF-03 [Reference APR-KF-03]

SNL has not implemented DOE Order 5480.19, Guidelines for the Conduct of Operations at DOE Facilities.

Discussion

The formality of operations required by DOE Order 5480.19 is largely absent. There are no corporate lockout/tagout procedures; some local procedures are in use, but they are poorly documented and likely to be ineffective. Only a few facilities have procedures for shift turnover, logkeeping, and status monitoring. SNL is developing a graded approach for applying the requirements of this order, but it has not yet been implemented.

The program to implement formality of operations should also be applied to draft DOE Order 4330.xxx, Maintenance Management Program, which will require a graded maintenance-management system.

Related findings were reported in Environment (ENV), Organization (OR), Auxiliary Systems (AX), Maintenance (MA), Packaging and Transportation (PT), and Operations (OP).

DOE Order 5480.19 was in the early stages of implementation at the time of the SNL, Livermore, Tiger Team visit, and there were no specific key findings with respect to that order. Nevertheless, the Tiger Team report noted a lack of formality in a number of areas.

Action Plan Requirement

APR-KF-03. SNL must develop and implement a program for conduct of operations as required by DOE Order 5480.19.

The program currently being developed is basically a restatement of the DOE order with additional definitions and cross-references to other SNL programs. It is complex (20 chapters), and a graded approach will require that organizations determine for each activity which chapters apply directly, how to apply a graded approach for those chapters, and how to apply the intent of other chapters.

More guidance than is currently contained in the program will be needed to ensure that organizations properly assess applicability of the many program elements to their activities. SNL should develop an overall project plan to implement a consistent conduct-of-operations program throughout the Laboratories.

Finding KF-04 [Reference APR-KF-04]

Facilities engineering at SNL, Albuquerque, is not accomplishing correction of deficiencies or modifications in a timely manner to support line organizations trying to come into compliance with DOE requirements.

Discussion

Discussions with supervisors and staff in a wide variety of facilities indicate a broad perception that Facilities Engineering is not responding quickly enough to clear ES&H-related deficiencies. Obvious safety problems are addressed right away, but correction of deficiencies and other modifications required by the many recent ES&H assessments have taken 6 to 12 months (many are still open). The reasons that Facilities Engineering has not been able to respond in a timely and well-organized way are not clear; a better system of assigning priorities is required, and additional resources may be required as well. The staff takes slow response and the absence of a visible plan as evidence that "management" is not committed to correction of ES&H problems.

Facilities Engineering activities at SNL, Livermore, were not the subject of a Tiger Team key finding.

Action Plan Requirement

APR-KF-04. Facilities Engineering and the ES&H Directorate should jointly determine how the present work-request system should be modified so that ES&H deficiencies are corrected in an appropriate time. An adequate system should include:

* actions to be taken to mitigate ES&H hazards before submitting work requests

* categories for ES&H-related work requests based on the associated hazards or risk

* a maximum response time for each category

* clear documentation, so that line organizations understand the system for assigning priority and know what to expect

Facility Engineering may need to change the present system of assigning priorities, add resources, or formally decide that action to correct some classes of "de minimis" deficiencies may be deferred.

Finding KF-05 [Reference APR-KF-05]

SNL, Albuquerque, TTR, and KTF are generally not in compliance with the requirements of 29 CFR 1910, Occupational Safety and Health Standards, as implemented through DOE Order 5483.1A, Occupational Safety and Health Requirements for DOE Contractor Employees at Government-Owned Contractor-Operated Facilities.

Discussion

Supervisors use what they believe are safe practices and follow existing guidance from the ES&H Directorate, but they are not familiar with and do not follow many of the requirements in 29 CFR 1910. Written requirements, other than 29 CFR 1910 or excerpts, have not been distributed to the line. Supervisors often do not know enough of the general content and flavor of the regulations to recognize instances where they should seek help from ES&H professionals. Examples are described in OSHA Compliance (WS).

The SNL, Livermore, Tiger Team identified 112 items of noncompliance with OSHA standards. Their key concerns in this area focused on lack of management guidance and definition of responsibilities and authority. Specific findings included respiratory protection and electrical safety. Findings by Albuquerque self-appraisal teams generally agree with those of the Livermore Tiger Team.

Action Plan Requirement

APR-KF-05. Directorate 3200 needs to revise the SNL ES&H Manual to fully reflect OSHA requirements as contained in DOE Order 5483.1A.

The revised manual should present SNL ES&H policy and provide guidance to all employees concerning overall ES&H requirements. It should be a living document, updated with changes in applicable laws, regulations, DOE orders, and so on. It must define the processes and documentation that will ensure compliance with these requirements. To meet performance objectives in the significant findings section (see Sections 4.4.23 and 4.4.24), the manual should contain references to and summaries of the detailed ES&H programs and subprograms.

Finding KF-06 [Reference APR-KF-06]

Construction activities at SNL, Albuquerque, TTR, and KTF are not in full compliance with 29 CFR 1926, Safety and Health Regulations for Construction, as required by DOE Order 5480.9, Construction Safety and Health Program.

Discussion

Construction contracts include a standard article requiring contractors to comply with applicable laws, regulations, and DOE orders. The Facilities Construction and Environmental Engineering Department (7850) requires review of contractor safety programs and oversight of construction activities by SNL inspectors.

In spite of these requirements, construction personnel do not consistently display awareness of the requirements of 29 CFR 1926. Major deficiencies exist in contractor training and documentation, and SNL oversight is not adequate to ensure contractor compliance. Recent construction projects have not fully met OSHA requirements. Examples are described in OSHA Compliance (WS).

The SNL, Livermore, Tiger Team found that construction oversight was inadequate. One of the two "imminent danger" findings at Livermore concerned an excavation by a contractor.

Action Plan Requirement

APR-KF-06. The Health and Safety Department (3210) and the Facilities Construction and Environmental Engineering Department (7850) should develop a program to ensure that construction activities comply with all applicable requirements of 29 CFR 1926, as contained in DOE Orders 5480.9, 5480.4, and 5483.1A.

This program should make contractors aware of regulations in 29 CFR 1926 as they are expected to apply to each contract task. A formal construction inspection program is needed to document contractor performance, with feedback to the contractor and to purchasing organizations.

The Purchasing Department (3740) should develop mechanisms to rehabilitate or eliminate chronically noncompliant contractors. The Health and Safety Department (3210) should develop a program to train SNL construction inspectors.

Finding KF-07 [Reference APR-KF-07]

SNL does not have an ES&H quality assurance (QA) program as required by DOE Order 5480.1B and DOE/AL Order 5700.6B. The SNL Quality Plan, dated April 1986, is not effectively implemented and has little impact on the operational success of ES&H activities.

Discussion

Although SNL has a quality plan throughout the corporation that ostensibly meets the DOE requirements, this plan is not widely honored. No subordinate QA plan is in place to cover ES&H activities. SNL is currently revising its entire quality policy and is preparing an ESH&QA program under the umbrella of its developing Quality Improvement Plan. There is concern, however, that the draft ESH&QA program is too complex, is not cost-effective, and does not comply with the policy objectives of DOE Order 5700.6B, which requires that QA programs place primary emphasis on achieving a high degree of operational success.

The SNL, Livermore, Tiger Team noted that QA functions are not effectively organized and that QA programs are not in place outside weapon programs.

Action Plan Requirement

APR-KF-07. To meet the requirements of quality verification (QV), SNL should establish a program that

* is based on DOE Order 5700.6B
* places primary emphasis on the operational success of ES&H activities
* is concise, cost-effective, and functional in the SNL environment
* is based, where possible, on recognized standards appropriate to the activities being controlled
* contains performance criteria and audit procedures that monitor and genuinely enhance the operational success of the activities being controlled
* embodies the concept of "deliberate intent" to maintain a safe, environmentally benign workplace

Finding KF-08 [Reference APR-KF-08]

There is insufficient communication of requirements between line organizations, who are familiar with operations being conducted, and ES&H professionals, who understand environmental laws and safety and health regulations.

Discussion

Staff members and technicians in line organizations comply with ES&H requirements as they understand them, but are often poorly informed of these requirements. The ES&H Manual is an effective resource in this regard. It translates many requirements into plain English and refers the reader with specialized problems to source documents for requirements. The ES&H

Manual is incomplete, however, and there is not enough direct communication through other channels so that those at the working level in the line know when they should call an ES&H expert. Professionals in Directorate 3200, on the other hand, cannot stay informed concerning activities throughout SNL well enough to know when their services are needed.

The SNL, Livermore, Tiger Team did not report a key finding on communication between ES&H professionals and the line.

Action Plan Requirement

APR-KF-08. The ES&H Directorate needs to develop a broad program to communicate complete up-to-date information on ES&H requirements to line organizations. A key element of this program should be an update of the ES&H Manual (SAND88-1161). The revision should describe SNL policy and the overall system for ensuring that requirements are properly interpreted and implemented, as well as a summary of the programs and subprograms that meet specific performance objectives detailed in the worker safety findings (SF-WS-01 through SF-WS-19).

Line organizations share the responsibility for adequate communication and must ensure that personnel are adequately trained in SNL ES&H policy, requirements, and responsibilities.

Finding KF-09 [Reference APR-KF-09]

SNL does not have a lessons-learned program to profit from incidents at SNL and other facilities.

Discussion

In the past, Unusual Occurrence Reports (UORs) were sent to the VP SHEAC chairman; the extent of further distribution was different for different SHEACs. There was no analysis other than that provided on the UOR form for root causes or trends.

DOE Order 5000.3A, which was implemented in September 1990 at SNL, has more explicit definition of reportable events: emergencies, unusual occurrences, off-normal occurrences. The volume of reports has increased markedly -- each month about 20 reports are generated at SNL and about 200 are received from other DOE facilities (these numbers are expected to increase). SNL has not yet decided how to handle this large volume of reports. Internal distribution of SNL reports is quite limited, and there is no analysis or distribution of reports from other DOE facilities.

The SNL, Livermore, Tiger Team also found there were no management systems to track and analyze safety data, and no regular assessments of ES&H activities and progress.

Action Plan Requirement

APR-KF-09. SNL should develop an ES&H lessons-learned program with the following features:

* Periodic publication of SNL ES&H performance metrics (perhaps broken down by directorate)

* Review of SNL incident reports for trends and applicability to other organizations at SNL; distribution to appropriate SNL organizations with requests for action if appropriate

* Review of incident reports from other DOE contractors for trends and applicability as above

* Feedback on applicability and actions taken to incorporate lessons learned.

Finding KF-10 [Reference APR-KF-10]

SNL does not have an ES&H issues-management program.

Discussion

SNL does not have a well-defined program to manage ES&H problems: to keep track of findings and deficiencies, rank them, establish priorities, identify resources required for correction, and develop short- and long-term plans and budgets. Obvious hazards are corrected immediately, but other ES&H-related deficiencies are treated more or less equally and there is no visible process to establish priorities and schedule corrective action. This causes confusion for those deciding how to allocate resources -- particularly departments and divisions -- and makes it difficult to predict the level of compliance that will be achieved versus time.

The SNL, Livermore, Tiger Team found that SNL lacked an implementation strategy for ES&H issues, resulting in an ad hoc, inconsistent approach to improvement.

Action Plan Requirement

APR-KF-10. SNL should develop an issues-management program to manage ES&H problems (tracking and ranking findings, identifying resources, planning for correction). The program should have high visibility in line, facilities, and ES&H organizations so that all are aware of corporate plans for addressing ES&H problems.

Finding KF-11 [Reference APR-KF-11]

ES&H training is largely informal and undocumented. The present system does not ensure that management and staff have all the knowledge they need to carry out their ES&H responsibilities.

Discussion

Self-assessment survey respondents from every area -- line organizations, facilities engineering, and ES&H -- felt that a formal training program is needed to ensure that management and staff have adequate knowledge of ES&H requirements and accepted procedures for achieving compliance. The present training program is adequate to cover most obvious hazards but has no hard measure of effectiveness and is not fully documented.

Similar findings were reported in Environment (ENV), Personnel (PR), Organization and Administration (OA), Training and Certification (TC), and Auxiliary Systems (AX).

The SNL, Livermore, Tiger Team identified insufficient ES&H training as a key finding.

Action Plan Requirement

APR-KF-11. SNL should establish a training and certification program that includes the following features:

* Corporate-level training requirements, including frequency of retraining, tasks requiring certification, and criteria for certification

* Training programs, including certification procedures where necessary

* Training requirements for each employee based on his or her job

* Training requirements for contractors and visitors.

The development of this program should involve line organizations that employ the skills for which training is required. Training should have significant hands-on elements wherever practical.

Finding KF-12 [Reference APR-KF-12]

SNL personnel, in general, treat waste, excess material, and pollutants with less concern and attention than they do their project's products and new materials.

Discussion

SNL personnel, in general, lack understanding of the magnitude of the environmental contamination and legal liabilities that can result when wastes, excess materials, and pollutants are improperly managed. In particular, once collection or monitoring requests have been submitted, SNL personnel tend to feel that such materials are another organization's responsibility. SNL personnel need to be educated on and give priority to storing and managing such materials with the same degree of care given to products and new materials until another organization officially assumes responsibility.

Action Plan Requirement

APR-KF-12. Reissuance of the SNL ES&H Policy is needed to give the managing of wastes, excess materials, and pollutants the same priority and concern shown products and new materials.

Finding KF-13 [Reference APR-KF-13]

Management lacks understanding of the work load involved in meeting ENV requirements and internal and external customer needs and demands.

Discussion

The demand for ENV compliance, internal consultation, and reports, permits, and other documentation for external requestors continues to increase; the Directorate 3200 staff is unable to satisfy all of these needs with an effective ENV program. While formal ENV procedures and guidance are necessary, they are insufficient to meet the needs of internal customers for individualized personal attention to their ENV concern. The belief that ENV programs can be written so simply yet comprehensively to obviate the need for increased personal ENV consultation appears based upon a lack of understanding that the underlying ENV requirements are extremely complex, voluminous, and subject to numerous changes in content and interpretation. The increasing emphasis on ENV compliance will only add to the demands for ENV expert assistance and services. The centralized ENV staff also is unable to devote time to develop technical excellence and parlay that excellence to SNL benefit through participation on boards and committees that set or influence ENV standards.

Action Plan Requirement

APR-KF-13. A multiyear staffing plan is needed to establish annual hiring authorization levels for centralized and decentralized ENV staff until the plan's final staffing level is achieved.

Finding KF-14 [Reference APR-KF-14]

The ES&H-related records management program is inadequate.

Discussion

The ES&H-related records management practices and procedures within Directorate 3200 and other SNL organizations are inadequate to support audit and records storage and retrieval activities. The SNL records center needs to be improved and records retention requirements need to be more clearly defined. Other organizations should improve their understanding of ES&H-related documentation and records retention requirements. The current inadequacies in the area of ES&H-related records management can be attributed to the following:

* Insufficient structure, standardization, and guidance regarding the disposition of corporate records and information management.

* A technical staff with little or no expertise in records management.

* The attitude among SNL staff that records management is primarily a clerical function; as such, records and information are treated as an afterthought and not as a tool or an asset.

* Unclear or inadequate external records management, retention, and distribution requirements (e.g., from DOE or the Environmental Protection Agency (EPA)).

* A lack of awareness that properly managed records and information are a valuable asset.

Action Plan Requirement

APR-KF-14. A revised ES&H-related records management program needs to be developed and implemented. The plan needs to identify the types of records to be generated by all organizations and the frequency with which they should be transmitted to their respective records center. The plan needs to address roles, responsibilities, and resources to properly manage and retain ES&H-related records.

Finding KF-15 [Reference APR-KF-15]

SNL lacks an ES&H-based performance assessment system by which management can provide feedback to individuals on their ES&H-related performance.

Discussion

The annual individual performance evaluation and compensation review system at SNL does not specifically include ES&H-related performance as an evaluation and review element.

Rather, performance evaluations at SNL seem to focus very heavily on technical project performance, with infrequent, scant attention being given to ES&H considerations. Other methods for effective feedback of an individual's ES&H-related performance are also lacking. It is vital that SNL employees understand the importance of ES&H issues in their workplace and work activities, and that they receive timely, meaningful, and effective feedback on their ES&H performance.

Action Plan Requirement

APR-KF-15. SNL must develop an employee performance assessment system that properly includes evaluation of, and feedback regarding, an employee's ES&H-related performance.

Finding KF-16 [Reference APR-KF-16]

SNL does not successfully integrate response times from DOE, EPA, and state regulatory agencies into its environmental project planning. As a result, limited resources are not always used efficiently.

Discussion

A continuing number of projects at SNL are contingent upon federal and/or state responses to or approvals of environmental reports, applications, and information requests. The ability of SNL to efficiently anticipate and integrate the response times into project planning and implementation is not adequate. This situation is believed to result both from a need for improved awareness and anticipation of SNL employees of incorporating response time into their project planning and an insufficiency of personnel at DOE and regulatory agencies.

The insufficiency of staff resources at DOE, EPA, and state regulatory agencies leads to perceived long response times for approvals and information requests, which, in turn, discourages staff with time-critical projects from achieving full compliance. An example of the response time of several months for DOE evaluation of basic National Environmental Policy Act (NEPA) documents, which discourages project staff from concluding they are subject to NEPA. Another example is the lack of personnel (and/or knowledgeable personnel) to accept telephonic hazardous material release reports made to Local Emergency Planning Committees (LEPCs) and State Emergency Response Commissions (SERCs). The lack of staff also hinders the development of good

communication between SNL and regulatory agencies since their personnel lack time to become familiar with SNL operations. The lack of sufficient personnel within DOE's Environmental Restoration and Waste Management Organization appears to cause slow response to questions from SNL staff personnel that are raised while attempting to respond to DOE information requests.

Action Plan Requirement

APR-KF-16. There is need for an action plan amenable to SNL implementation to increase communications with and reduce response times at EPA and DOE. The support agreement between DOE and the State of New Mexico should provide funding for the state regulatory agency to hire sufficient staff to improve communications and reduce response times. There is also a need to be certain that the need to plan for response times is included in ES&H communications and training.

Finding KF-17 [Reference APR-KF-17]

The commitment and resources devoted to NEPA compliance need to be improved, and the use of hazardous materials and generation of waste and pollution need to be minimized.

Discussion

Among the cardinal rules of ENV are these two: (1) reduction in the use of hazardous materials leads to hazardous waste and pollution, and (2) the earlier that environmental impacts are addressed, the less costly are the mechanisms required to mitigate those impacts (retrofits are more expensive). Yet, SNL lacks a formal program to reduce use of hazardous materials.

At its best, minimization will lead to eliminating hazardous material, which will, in turn, result in eliminating the associated health risks and added compliance activities. In addition, the value of NEPA documentation to identify environmental impacts early in a project life is not well understood nor appreciated by most SNL organizations, resulting in noncompliance with NEPA requirements.

Action Plan Requirement

APR-KF-17. An action plan needs to be developed to provide adequate resources to the Waste Minimization Network (MinNet), which is being formed to spearhead the minimization of hazardous materials use and waste generation. Reissuance of the ES&H Policy is needed to state clearly that minimization of hazardous materials use and waste generation is a top priority and high-leverage mechanism for improving health protection and ENV compliance. The MinNet needs to develop metrics for measurements of their

effectiveness and additional resources provided to MinNet where justified to improve its effectiveness. The value and compliance requirements of NEPA need to be emphasized in a revised ES&H policy, in training courses related to ENV compliance, and in the Quality Improvement philosophy of "do it right the first time."

Chapter 3
Environment

Chapter 3

Environmental Protection Assessment

3. Environmental Protection Assessment

3.1 Purpose

The purpose of this environmental protection (ENV) self-assessment was to evaluate the effectiveness of Sandia National Laboratories' (SNL) ENV programs to meet the following goals: (1) compliance with all applicable ENV requirements, (2) minimization of waste generation and maximization of pollution prevention, and (3) appropriate documentation of the ENV programs and their associated compliance activities.

3.2 Scope

The ENV self-assessment covered policies, procedures, and practices at SNL (including Albuquerque, Tonopah Test Range (TTR), and Kauai Test Facility (KTF)), which address the three goals stated above in the following ENV programs:

* Air Quality Management
* Surface and Groundwater Protection
* Environmental Monitoring
* Radioactive and Mixed Waste
* Chemical Hazardous Waste
* Sanitary Waste
* Facilities Asbestos Waste
* Hazardous Materials Transportation
* Inactive Waste and Release Sites
* National Environmental Policy Act (NEPA)
* Public Relations
* Waste Minimization and Pollution Prevention
* Polychlorinated Biphenyls Inventory and Waste

3.3 Methodology

This ENV self-assessment followed the general procedure explained in Section 1.4; however, because of the extremely specialized knowledge required to address most of the environmental issues, a findings input sheet (FIS) survey throughout the Laboratories was not employed. Instead, environment, safety, and health (ES&H) professionals from those organizations noted below were assigned FIS responsibility based on their individual areas of expertise. Those individuals also drafted and/or revised significant findings and action plan requirements, and they contributed the key findings in Chapter 2 related to environmental issues. FIS questions were derived from the audit questions and procedures in the Department of Energy (DOE) Environmental Audit Manual. Each of the fifteen program areas was separately addressed; to emphasize its significance in our self-assessment, a sixteenth program area, radioactive mixed

waste, was added, drawing from the Resource Conservation and Recovery Act (RCRA) and Radiation sections of the audit manual.

Organization assignments for this ENV self-assessment were as follows:

Environmental Programs Department (3220)

* Air quality management
* Sewers, surface/near-surface discharges
* Underground storage tanks
* Groundwater monitoring
* Environmental monitoring
* Radioactive and mixed waste (RMW)
* Chemical hazardous waste
* Inactive waste and release sites
* NEPA
* Waste minimization and pollution prevention
* Polychlorinated biphenyls (PCB) inventory and waste

Operational Services Department (3420)

* Sanitary waste
* Hazardous materials transportation (HMT)

Facilities Construction and Environmental Engineering Department (7850)

* Facilities Asbestos Waste

Public Relations Department (3160)

* Public Relations

Source documents most frequently referenced in preparing this self-assessment are listed below. Other references more specific to individual subprograms were also used.

* Clean Air Act (CAA)

* Clean Water Act (CWA)

* Resources Conservation and Recovery Act (RCRA)

* Hazardous and Solid Waste Amendments (HSWA) to the Resources Conservation and Recovery Act

* National Environmental Policy Act

* Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA)

* Hazardous Materials Transportation Act (HMTA)
* Safe Drinking Water Act (SDWA)
* Toxic Substances Control Act (TSCA)
* Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)
* Superfund Amendments and Reauthorization Act (SARA)
* DOE Order 5400.1, General Environmental Protection Program
* DOE Order 5400.2A, Environmental Compliance Issue Coordination
* DOE Order 5400.3, Hazardous and Radioactive Mixed Waste Program
* DOE Order 5400.4, Comprehensive Environmental Response, Compensation, and Liability Act Requirements
* DOE Order 5400.5, Radiation Protection of the Public and the Environment
* DOE Order 5440.1C, National Environmental Policy Act
* DOE Order 5480.14, Comprehensive Environmental Response, Compensation, and Liability Act Program
* DOE Order 5820.2A, Radioactive Waste Management

After completing an initial draft of this ENV self-assessment, we reviewed the SNL, Livermore, Tiger Team assessment to ensure that we had not overlooked findings applicable to SNL, Albuquerque, TTR, or KTF. General agreement was noted; in particular, the second paragraph on the Tiger Team environmental assessment summary (page 3-3) accurately states the condition of the programs at SNL.

3.4 Significant Findings and Action Plan Requirements

3.4.1 Clean Air Act

3.4.1.1 Overview

The Clean Air Act (CAA) is the basis for regulating air pollutants to protect human health and the environment.

Pollutants entering the air from any source may be regulated through a system of national emission limits and permits for individual discharge. Both new and existing dischargers of particulate and/or gaseous matter to the air are required to comply with standards under the act. Within Bernalillo County, most permit issuance and enforcement is carried out by the City of Albuquerque under the standards of the Albuquerque/Bernalillo County Air Quality Control Regulations (AQCR). The AQCR (No. 1 through No. 34) covers all criteria pollutants, volatile organic compounds (VOCs), hazardous air pollutants, burn test emissions, New Source Performance Standards (NSPS), and others.

Under the National Emission Standards for Hazardous Air Pollutants (NESHAP) section of the CAA, the Environmental Protection Agency (EPA) regulates the emission of radionuclides from SNL. Other hazardous air pollutants are regulated by the City of Albuquerque. The employee health protection provisions under the NESHAP for asbestos are addressed in the industrial hygiene program.

SNL, Albuquerque, has a number of sources of radioactive and nonradioactive air contaminants, some of which require permits. The major radiation sources are in Area V (ACRR, HCF and SPR), Area IV (HERMES III, Saturn, PBFA-II), Area III (MWL, Large Melt Facility, Melt & Solidification Lab), Area II (explosive components testing), and some small sources in Area I. The radioactive emissions include Ar-41, Kr-85, Xe-133, H-3, N-13, O-15, U-238, and other activation and fission products. SNL submits annual radionuclide emission reports to DOE and EPA under the requirements of DOE Order 5400.1 and NESHAP, Subpart H. EPA issues NESHAP permits for new sources and modifications to sources that result in 0.1 mrem/year impact (or greater) to offsite members of the public.

Nonradioactive contaminants emanate from various fuel burning activities, fuel storage, chemical processes, paint spray booths, coating and plating activities, degreasers, solvent cleaning units, machine shops, and others. Most of these sources located in Area I have emissions below the AQCR criteria for "major" or "significant" sources. SNL submits annual reports for criteria pollutants to the City of Albuquerque, Air Pollution Control Division, which has authority over nonradioactive sources and issues permits for construction, operation, and modification of these sources.

All operations or activities involving releases of hazardous air pollutant, listed in 40 CFR 61.01 (a) and (b), regardless of amount, may be required to be permitted by the EPA or the Albuquerque/Bernalillo County Air Quality Control Board before the start of new construction, operation, or modification that will result in the release. The projected impact of a potential new release is determined by Division 3223 through air modeling efforts. Since the evaluation, permitting, and approval process may exceed six months, written notifications must be sent by the organization contemplating a hazardous air pollutant emission or change to Division 3223 at least nine months before the emission or change.

All new sources generating or capable of generating more than 10 pounds/hour of any other air contaminant, or any modification to an existing source resulting in an increased emission or capability of more than 10 pounds/hour of any other air contaminant, may require a permit before the construction or modification. Therefore, Division 3223 is to be notified by the organization contemplating an emission or change, in writing, of all such proposed construction and modifications at least six months before the start of the construction or modification.

Renovations, modifications, and demolitions of buildings containing asbestos require regulatory notice and, probably, approval before the start of such activities. Therefore, Division 3211 must be notified immediately upon the discovery of asbestos in any building, and Division 7853 must be notified as early as possible, but not less than 20 days, before the start of any renovation, modification, or demolition in a building containing asbestos so Division 7853 can properly notify the appropriate regulatory agency.

Open-burning activities at SNL require permits issued by the City. Multiple burn permits may be granted if the facility has routine burn activities that are covered by an approved NEPA document.

Various annual air emission reports are required by the City, DOE, and EPA. Therefore, all SNL organizations that have permitted air emission sources are required to keep a complete record of their emissions to support Division 3223 reporting activities.

3.4.1.2 Significant Findings

Finding SF-CA-01 [Reference APR-CA-01]

A comprehensive assessment of air pollution sources to document the SNL state of compliance with air quality regulations is lacking.

Discussion

While no SNL air pollution sources are believed to be noncompliant with respect to regulatory criteria, a complete assessment for the sources, using EPA authorized models and formal documentation, is needed for demonstrating full compliance. In addition, such an inventory is needed to assess if stack/vent heights and exit velocities are appropriate to minimize near-source impacts.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding A/CF-1).

Finding SF-CA-02 [Reference APR-CA-02]

Since the definition of "periodic confirmatory measurements" is not clear, radionuclide air effluent measurements may be necessary to meet the requirements of the NESHAP.

Discussion

According to NESHAP for radionuclides, continuous air effluent sampling and measurements are required for sources that result in an offsite dose impact of 0.1 mrem/yr or greater. Otherwise, "periodic confirmatory measurements shall be made to verify the low emissions." EPA does not specify any frequency or methodology for the "periodic confirmatory measurements."

SNL radionuclide emission sources are calculated to have less than 0.1 mrem/yr offsite dose impact. Therefore, unless the air emission source inventory and assessment effort shows differently, continuous sampling and measurement at each radionuclide emission stack is not required by the current regulation. However, because most sources are determined by calculations instead of measurements, periodic confirmatory measurements for each exempted source may be necessary to verify the calculated values and support SNL's exemption status.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding A/CF-2).

Finding SF-CA-03 [Reference APR-CA-03]

The form prescribed by DOE for annual reporting of radionuclide releases by SNL does not provide all the information required in 40 CFR 61.94.

Discussion

The radionuclide source reporting requirement stated in 40 CFR 61.10 (now 61.94) was never implemented by DOE in the past because of the lack of Government Accounting Office (GAO) approval. Instead, DOE has issued a simplified form to all DOE contractors for annual reporting. This simplified form does not contain all the information required by EPA.

GAO approved the NESHAP, Subpart H, reporting requirement in 1989 for the revised regulation. Therefore, complete reporting is now possible for DOE facilities.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-CA-04 [Reference APR-CA-04]

Compliance documentation by line organizations regarding necessary emission controls, maintenance of control equipment, and assurance of meeting permit conditions or exempted conditions is lacking.

Discussion

Many air sources rely on their emission control devices to minimize pollution. Typical control equipment such as high efficiency particulate air (HEPA) filtration, bag houses, scrubber systems, and burn boxes, are being used at SNL to control emissions. However, the current testing and maintenance records are inadequate to document control efficiency and proper functioning of the control system used. Because most permit conditions or exemptions are based on the assumption that control efficiencies are being continuously met, SNL needs to have documentation that the efficiencies are being met or corrected when they are not being met.

Similar findings were identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Findings A/CF-1 and A/BMPF-1).

Finding SF-CA-05 [Reference APR-CA-05]

Planning to meet the meteorological monitoring requirements of DOE Orders 5400.1, 5400.5, and 5400.xy appears to need strengthening to meet the specified deadlines.

Discussion

SNL does not have a meteorological monitoring system to meet the requirements set in DOE Orders 5400.1, 5400.5, and 5400.xy. Historically, SNL, Albuquerque, has been using information obtained from the Albuquerque International Airport to support its meteorological needs. Such information is not believed acceptable to meet DOE requirements for remote SNL areas, such as the Coyote Test Field and Thunder Range sites. The airport information is also not believed to be acceptable for emergency situations when real-time meteorological data are needed for calculating plume dispersion resulting from accidental releases of hazardous materials into the atmosphere.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding A/BMPF-3).

Finding SF-CA-06 [Reference APR-CA-06]

Air sampling stations for monitoring of potentially hazardous air emissions from SNL sites are lacking.

Discussion

There are no routine air sampling stations at SNL to monitor potentially hazardous air emissions to support the accuracy of emission levels calculated by air dispersion models. Air sampling from calculated maximum impacted areas is necessary to demonstrate that the real impacts are not in conflict with model predictions.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-CA-07 [Reference APR-CA-07]

Inadequate personnel resources are assigned to the air quality management program.

Discussion

Efforts needed to achieve compliance with the new requirements found in the 1990 Clean Air Act amendments and the findings discussed above cannot be accomplished in a timely or effective manner with existing staff and resources.

Limited personnel resources were also noted by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding A/CF-1).

3.4.1.3 Action Plan Requirements

APR-CA-01. The initial air emission inventory and impact assessment throughout the site needs to be completed. The results of the inventory and assessment need to be provided to DOE and appropriate regulatory agencies to demonstrate SNL's state of compliance. This effort needs to be repeated periodically to update the inventory and the impact. The assessment will include subassessments for all sources of the same type to determine the total impact for each source type.

APR-CA-02. SNL needs to develop a plan to state the specific emission sources, frequency, and testing to be done to meet the NESHAP requirement for "periodic confirmatory measurements."

APR-CA-03. A plan is needed to recommend to DOE/AL the changes to the radionuclide air releases form to meet EPA reporting requirements.

APR-CA-04. A plan needs to be developed that identifies roles, responsibilities, and resources for line and support organizations to have adequate documentation of the proper operation of air pollution control and monitoring equipment.

APR-CA-05. SNL needs to study the requirements in DOE Orders 5400.5 and 5400.xy and develop a plan and schedule to meet the meteorological monitoring requirements of DOE Orders 5400.1, 5400.5, and 5400.xy. The plan needs to identify roles, responsibilities, and resources for line and support organizations to meet the requirements.

APR-CA-06. A plan is needed to determine the number and placement of sampling stations for various hazardous air pollutants at different technical areas. Sampling frequencies and methods for the stations also need to be developed.

APR-CA-07. A staffing plan and schedule need to be developed to meet current and anticipated air pollution compliance activities.

3.4.2 Clean Water Act

3.4.2.1 Overview

The Clean Water Act (CWA) provides the legislative vehicle for regulating the discharge of effluents and pollutants into surface waters by municipal sources, industrial sources, and other specific and nonspecific sources.

The ultimate goal of the CWA is to eliminate all discharges of pollutants into surface waters. Its interim goal is to make all waters in the United States usable for fishing and swimming.

Under the CWA, EPA sets effluent guidelines for various types of industries and municipal sewage treatment plants. These guidelines are minimum, technology-based levels of required pollution reduction. Using these guidelines, the EPA, states, or cities issue individual facilities, whether municipal or industrial, a permit to discharge wastes either into surface waters or into Publicly Owned [sewage] Treatment Works (POTWs). The individual permit specifies the types of control equipment and discharge limits for the specific facility and is written with the quality of the receiving waterway in mind.

SNL, Albuquerque, discharges wastewater to the City of Albuquerque POTW. Most discharges from Areas I, II, and IV go to the POTW and are monitored in accordance with wastewater discharge permits issued by the City of Albuquerque. Internally, discharge of chemicals into the sanitary sewer system must be in compliance with the most recent written guidance available from Division 3221, designed to allow SNL to have its aggregate discharges meet the conditions of its permits.

Operations similar in nature to industrial or commercial operations (such as electroplating, photoprocessing, and semiconductor manufacturing) that have discharges into the sanitary sewer system may require individual permits, and all such operations are required to have written approval from Division 3221 before commencing water discharges.

A new sanitary sewer line is currently being constructed to replace a number of septic tanks. The line will initially service portions of Area III and the Coyote Test Field.

3.4.2.2 Significant Findings

Finding SF-CW-01 [Reference APR-CW-01]

The legislative deadline that may be applicable to the permitting of storm water discharges by SNL, Albuquerque, has passed without a permit being obtained because the EPA did not promulgate permitting regulations and requirements.

Discussion

The EPA has published a proposed schedule that provides for issuing storm water discharge permits after the legislatively mandated deadlines. SNL is unable to submit a permit application until the information required on the application(s) becomes known.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-CW-02 [Reference APR-CW-02]

There is no procedure to assure that process changes, made to operations discharging to sanitary sewers, are brought to the attention of Division 3221 to assess the need for permit modifications.

Discussion

SNL organizations with chemical discharges to sanitary sewers are not uniformly notifying Division 3221 of proposed discharge changes. The notifications are needed so the effects on existing permits can be assessed and changes requested to the permits where needed.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-CW-03 [Reference APR-CW-03]

There are inadequate personnel resources to implement the discharge sewer program and to provide line personnel with the individual assistance requested by them even when written guidance is available.

Discussion

Numerous requests are received from line organizations for individualized assistance with understanding and meeting sewer discharge requirements. The quality and quantity of the written guidance available to the requesters does not seem to prompt the request; rather, the requests appear to result from the fundamental lack of understanding of information needed to meet the requirements. An example is the use of photographic development equipment which may discharge materials to be registered with Division 3221. Much of the equipment is known to operators as "black boxes" into which one pours "ABC solutions," adds undeveloped film, pushes some buttons, and receives developed film. Such personnel seem to need individualized assistance just to secure the information needed to make discharge registration and compliance decisions.

Limited personnel resources were not noted by the Tiger Team during its assessment of the Clean Water Act program area at SNL, Livermore.

3.4.2.3 Action Plan Requirements

APR-CW-01. SNL, Albuquerque, should complete and submit storm water discharge permit applications in accordance with applicable regulations when they are promulgated.

APR-CW-02. For permit modification reviews, an internal wastewater discharge program needs to be developed and implemented that includes requirements for the notification of process changes affecting wastewater discharges.

APR-CW-03. A plan is needed to develop and implement a wastewater discharge program staffing plan.

3.4.3 Comprehensive Environmental Response, Compensation, and Liability Act and the Superfund Amendments and Reauthorization Act

3.4.3.1 Overview

The Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA) and the Superfund Amendments and Reauthorization Act (SARA) govern the cleanup of hazardous substance releases in air, water, and

groundwater, and on land. Both new spills and existing or abandoned contaminated sites are covered.

Title III of SARA requires the reporting of inventories of hazardous chemicals, which are maintained above listed threshold quantities, to federal, state, and local agencies; this section is covered by the industrial hygiene program. SARA Title III also requires manufacturing facilities to make annual reports on chemical emissions to the environment. As of July 1990, SNL did not provide the annual reports since it is not a manufacturing facility.

CERCLA/SARA also requires the immediate reporting of releases of hazardous wastes and listed hazardous substances and radionuclides above a Reportable Quantity (RQ) level to the National Response Center at (800) 424-8802 and, if any part of the release leaves the facility boundaries, to the appropriate State Emergency Response Commission (SERC) and Local Emergency Planning Committee (LEPC) as well.

An Environmental Restoration Program (ERP), headed by Division 3223, is under way to identify, assess, and remediate, where necessary, environmentally contaminated sites at SNL.

3.4.3.2 Significant Findings

Finding SF-C-01 [Reference APR-C-01]

Quantitative criteria (metrics) for assessing the performance and adequacy of ERP actions are lacking in regulations and DOE orders.

Discussion

The ERP is charged with leading the effort to assess and decontaminate, where needed, environmentally contaminated sites within SNL. However, there is a lack of quantitative criteria and methods by which the question of "How clean is clean enough?" is addressed. While some quantitative contamination criteria exist, such as drinking water standards, they are of limited applicability to most ERP activities. An example is the appropriate decontamination level for a chemical contaminant in soil approximately 500 feet above groundwater. Should the contaminant be removed to drinking water levels (if so, how does one handle the differences between soil and water?), to background levels (if so, how is background established?), to a predicted level sufficient to prevent the groundwater from exceeding the contaminants' drinking water level (if so, what model is used?), or to some other level? Currently, such decisions are made on a site-by-site basis, and the lack of more uniformity among DOE and

national environmental restoration efforts may lead to perceived and, perhaps, actual significant differences in public protection offered by environmental restoration activities at different DOE locations.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-C-02 [Reference APR-C-02]

The generation, management, and control of ERP documents needs to be improved.

Discussion

The documents generated during the anticipated 10- to 20-year life span of the ERP will serve as the fundamental evidence of the degree to which environmental restoration was accomplished at SNL. Since future scientific and societal developments may cause changes in environmental restoration requirements, the ERP records need to be well managed and preserved for future comparison to any changed requirements. Current records do not fully meet the requirements of DOE Order 5400.4.

The ERP currently lacks a records generation, management, and retention system to ensure that ERP documents will meet requirements of DOE Order 5400.4 and be preserved for ready access well beyond the life of the ERP itself.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding IWS/CF-1).

Finding SF-C-03 [Reference APR-C-03]

SNL lacks a formal document describing the relationship between the National Contingency Plan (NCP) and SNL ERP activities.

Discussion

The NCP sets forth the procedures and requirements for the assessment and remediation of environmentally contaminated sites, particularly for National Priority List (NPL) sites. SNL lacks a written statement establishing the relationship between the operation of the ERP and the NCP. A statement is needed to clarify which aspects of the NCP are applicable to the ERP and how the ERP will meet those aspects. The statement also needs to describe how to identify and resolve inconsistencies between the NCP and the ERP.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding IWS/CF-1).

Finding SF-C-04 [Reference APR-C-04]

SNL lacks a developed Community Relations Plan (CRP) for its ERP activities.

Discussion

DOE Order 5400.4 and 40 CFR 300.67 require a CRP for ERP activities; SNL has a plan under development.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding IWS/CF-3).

3.4.3.3 Action Plan Requirements

APR-C-01. SNL needs to identify and provide resources to research and develop appropriate environmental restoration metrics and to influence DOE and regulatory agencies to accept them. The establishment of the performance and adequacy metrics should be more centralized within DOE; however, the development and implementation of the methods used to meet the metrics should be left at the local facility level.

APR-C-02. A plan and resource requirements need to be developed to generate, manage, and preserve ERP records in accordance with DOE Order 5400.4.

APR-C-03. A policy statement needs to be developed and issued that identifies the aspects of the NCP applicable to the SNL ERP and describes how those aspects will be met by the SNL ERP. The policy statement needs to describe how to identify and resolve inconsistencies between the NCP and the ERP.

APR-C-04. A Community Relations Plan for the SNL ERP needs to be developed and implemented to meet the requirements of DOE Order 5400.4 and 40 CFR 300.67.

3.4.4 Federal Insecticide, Fungicide, and Rodenticide Act

3.4.4.1 Overview

The Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA) provides regulatory authority for registration and use of pesticides and similar products intended to kill or control insects, rodents, weeds, and other living organisms. Key to the definition of "pesticides" is the concept of intended use, which allows a broad range of regulatory authority over chemicals and devices that function as pest control agents, regardless of their original purpose of manufacture.

Under the law, if a product is represented in such a way as to result in use as a pesticide, the product is considered to be a pesticide under FIFRA.

In addition to insecticides and rodenticides, products to control plants, trees, weeds, fungi, algae, bacteria, viruses, nematodes, and other life forms are considered to be pesticides. Also included are herbicide products used to stop plant growth or defoliate crop plants.

In addition to chemical pesticides, the EPA regulates products that affect plant growth; biological products, such as pheromones (sex attractants) and juvenile growth hormones (substances that keep insects from maturing and reproducing); and even bacteria and parasites that cause insect diseases, if these are used as pesticides.

Pesticides are to be used at SNL only by properly licensed and EPA-certified applicators. Currently, this requirement is met through the exclusive use of certified contract pesticide firms to apply pesticides at SNL. Only properly EPA-registered pesticides may be used at SNL; no other products or materials may be used. SNL's pest control program is directed not only to achieve pest control needs but also to minimize the adverse impact on nonpest species.

Division 3211 annually reviews the Material Safety Data Sheets (MSDSs), labels, and usage criteria for all pesticides used at SNL. Division 3211 also maintains a file containing the MSDSs and labels for the pesticides used at SNL. Division 7816 oversees pest control contracts and annually audits the contractor licenses. Each certified contract applicators maintains records of the specific pesticides used at SNL. Department 3710 ensures that no pesticides are purchased with SNL funds except by the certified applicators. TTR and KTF maintain similar procedures regarding the procurement and use of pesticides.

3.4.4.2 Significant Findings

None

3.4.4.3 Action Plan Requirements

None

3.4.5 Hazardous Materials Transportation Act

3.4.5.1 Overview

The Hazardous Materials Transportation Act (HMTA) provides authority for regulating the transportation of hazardous materials by road, air, and rail. The Department of Transportation (DOT) Materials Transportation Bureau (MTB) designates specific quantities and forms of substances as hazardous and specifies packaging, labeling, and shipping requirements for materials that pose a risk to health, safety, or property.

The MTB designates materials as hazardous and drafts regulations on their transport. It also enforces compliance with specifications for packaging and containers and for shipments traveling by more than one mode. Enforcement and compliance for hazardous materials traveling by a single mode of transport (e.g., rail only) falls to the DOT branch with jurisdiction over that type of transport (i.e., Federal Aviation Administration, Federal Highway Administration, Federal Railroad Administration, or US Coast Guard).

All hazardous and radioactive materials and wastes transported to and from SNL must meet DOT requirements for packaging, labeling, and shipping. Therefore, at SNL, Albuquerque, all hazardous and radioactive materials must be shipped through Division 3428, and all hazardous and radioactive wastes through Department 3220. At all other SNL locations, organizations must ensure their hazardous and radioactive material and waste shipments are made in conformance with DOT requirements. At TTR and KTF, SNL directs the packaging and transportation operations that are performed by DOE support contractors REECO and Raytheon, respectively. Employees must not handcarry nor transport in baggage any hazardous or radioactive materials or wastes.

3.4.5.2 Significant Findings

The significant findings for the HMTA program area are identical to those identified in Section 4.4.9.2 (Packaging and Transportation) and are, thus, not repeated here.

3.4.6 Natural and Cultural Resources, Including the National Environmental Policy Act

3.4.6.1 Overview

The natural and cultural resources program area, which includes the National Environmental Policy Act (NEPA) and related federal environmental statutes, regulations, and orders, may affect implementation of proposed actions. NEPA requires varying levels of environmental review before actions are taken at a federal facility, such as SNL, that may have a potential or actual environmental effect.

Proposed actions submitted for NEPA consideration at SNL include review for threatened and endangered species, surveys for archaeological and historic resources. Reviews for other statutes may be included in NEPA documentation where applicable.

The NEPA program, as administered by Division 3223, provides guidance to line organizations and facilities engineering for the preparation of NEPA documentation for proposed actions, and reviews that documentation for accuracy and completeness before transmittal to DOE. The program has attempted to keep abreast of the changing requirements and guidance from DOE/EH.

3.4.6.2 Significant Findings

Finding SF-NE-01 [Reference APR-NE-01]

The following laws and directives need to be evaluated to assess their applicability to the NEPA program at SNL and the results of the assessment need to be documented.

* The Antiquities Act of 1906: 16 USC 431-435
* The American Indian Religious Freedom Act: 42 USC 1966
* Bald and Golden Eagle Protection Act: 16 USC 668-668(d); 50 CFR 10-13 and 22
* Coastal Zone Management Act: 16 USC 1451-1464; 15 CFR 923, 930, and 931; PL 92-568
* Endangered Species Act: 16 USC 1531-1544; 50 CFR 17, 216-217, 402, and 450-453; PL 93-205
* Environmental Safeguards for Animal Damage Control on Federal Lands: Executive Order (EO) 12342
* Federal Compliance and Pollution Control Standards: EO 12088; DOE Order 5480.4

* Federal Land Policy Management Act: 42 USC 1701 et seq.

* Floodplain Management: EO 11988 as amended by EO 12148; 10 CFR 1022

* Farmland Protection Policy Act: 7 USC 4201-4209; 7 CFR 658

* Fish and Wildlife Coordination Act: 16 USC 661-666; 50 CFR 19

* Migratory Bird Treaty Act: 16 USC 703-712; 50 CFR 10.13, 12-13, and 20-21

* Marine Mammal Protection Act: 16 USC 1361 et seq.; PL 92-522 and PL 96-366; 50 CFR 12, 13, 18 and 216

* Marine Protection, Research, and Sanctuaries Act: 33 USC 1401-1444 and 16 USC 1431-1434; 15 CFR 220 et seq. and 921

* Noise Control Act: 42 USC 4901-4918 and 49 USC 1431; PL 92-574; 40 CFR 203-205

* National Forest Management Act: PL 94-588 and 90 Stat. 2949, as amended

* National Trails Systems Act: 16 USC 1214-1249

* National Wilderness Preservation Act: 16 USC 1131 et seq.; 43 CFR 19

* Protection of Wetlands: EO 11990; 10 CFR 1022; 16 USC 1221-1226

* Rivers and Harbors Act: NEPA; 33 USC 401-413; 33 CFR 322-323

* Responses to Environmental Damage (EO 12316): EO 12316 (replaces EO 12286); DOE Orders 5480.4, 5480.1 (Chapter 4), and 5481.1 (Change 2 IV-10, No. 2)

* Soil and Water Conservation Act: 16 USC 2001

* Wild and Scenic Rivers Act: 16 USC 1271-1287

* Wild Free-Roaming Horses and Burros Act of 1971: 16 USC 1331-1340

Discussion

There is a lack of complete understanding of the full range of laws and other requirements that might apply to the NEPA process at SNL, Albuquerque, TTR, and KTF. While all of the major and most of the minor laws and

requirements are considered during the NEPA process, some of the lesser-known laws and requirements also need to be considered.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding NEPA/CF-2).

Finding SF-NE-02 [Reference APR-NE-02]

The consistent application of the NEPA process to SNL activities is poor, and compliance by SNL projects with NEPA requirements needs to be improved.

Discussion

While construction activities have a formalized review process that includes Division 3223 review for NEPA applicability, there is no corresponding review process for nonconstruction, particularly R&D, activities to ensure that NEPA requirements are met before commencement of the activities. The discovery of some R&D and experimental activities that do not have appropriate NEPA documentation indicates a lack of understanding by R&D organizations of NEPA requirements.

Similar findings were identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Findings NEPA/CF-2 and NEPA/BMPF-1).

Finding SF-NE-03 [Reference APR-NE-03]

The responsibilities for SNL NEPA coordination and concurrence need to be centralized into one organization to improve the effectiveness and efficiency of the NEPA compliance process.

Discussion

Currently, the responsibilities for NEPA coordination and concurrence are split between Division 3223 and Division 7853. This split results in longer review and concurrence times for NEPA documents.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-NE-04 [Reference APR-NE-04]

The DOE lacks the resources to review and comment on NEPA documentation in a timely manner, which discourages full compliance with NEPA requirements.

Discussion

DOE needs to review NEPA documents in a timely manner, preferably taking less than a month, to provide a practical means of meeting the schedules of SNL customers. Currently, review and approval even of simple NEPA documents may take several months. The long review times appear to be a result of inadequate personnel resources within DOE to provide timely reviews of NEPA documents.

During its assessment of the environmental programs at SNL, Livermore, the Tiger Team noted that DOE/MSD's NEPA review procedure was inefficient and cumbersome, which allowed some projects to proceed without proper NEPA documentation (Finding NEPA/BMPF-1).

Finding SF-NE-05 [Reference APR-NE-05]

The responsibilities of SNL for NEPA compliance for the various types of real estate within which it conducts activities are unclear.

Discussion

SNL has facilities on DOE land owned in fee simple, DOE land withdrawn from the US Forest Service, DOE-leased land from the USAF, and DOE-leased land from the USAF that is withdrawn from the US Forest Service. The Bureau of Land Management oversees the withdrawn land. It is unclear whether NEPA requirements have been met within the nonowned areas and whether the tenant, owner, lessee, or withdrawal agent is responsible for NEPA compliance. NEPA-related documentation may also be scattered among the federal agencies involved.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-NE-06 [Reference APR-NE-06]

Site-wide Environmental Impact Statements and Environmental Assessments for SNL facilities are outdated or missing.

Discussion

The site-wide Environmental Impact Assessment for SNL, Albuquerque, and the Environmental Assessment for TTR were written in the late 1970s and never updated. The Environmental Assessment for KTF is waiting for DOE approval.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding NEPA-CF-4).

3.4.6.3 Action Plan Requirements

APR-NE-01. A plan needs to be developed and implemented to assess SNL applicability for all environmental laws and requirements, and to develop a process to ensure consideration of their applicability in future NEPA activities.

APR-NE-02. A plan needs to be developed and implemented to educate SNL organizations on NEPA requirements and to require NEPA review and documentation of proposed activities.

APR-NE-03. A plan is needed to consolidate NEPA coordination and concurrence into one organization with the appropriate additional resources to handle the increased work load.

APR-NE-04. A strategy needs to be developed to reduce the time needed within DOE for NEPA document reviews.

APR-NE-05. A request needs to be made to DOE to clarify the NEPA responsibilities for land used by SNL that is not owned by DOE. A plan then needs to be developed to document the NEPA compliance status and to correct noncompliances, if any.

APR-NE-06. A plan and schedule need to be developed in conjunction with DOE to update the Environmental Impact Statements or Environmental Assessments for SNL, Albuquerque, and TTR.

3.4.7 Resource Conservation and Recovery Act and the Hazardous and Solid Waste Amendments

3.4.7.1 Overview

Although the Resource Conservation and Recovery Act (RCRA) and the Hazardous and Solid Waste Amendments (HSWA) were passed to control all varieties of solid waste disposal and to encourage recycling and alternative energy sources, their major emphasis is control of hazardous wastes. The laws established a system to identify wastes and track their generation, transport, and ultimate disposal.

Under the law, EPA establishes identification criteria and lists substances that are considered hazardous when generated, stored, disposed or treated. Anyone who generates hazardous wastes above a certain amount must register with EPA and comply with requirements applying to generators of waste. Transporters of hazardous wastes must be registered with the agency. Permits must be obtained by disposal and treatment sites receiving hazardous wastes. A multicopy manifest must accompany each shipment of hazardous wastes from

generator to the ultimate disposal or treatment site so that the waste may be tracked. Records on waste generation, storage, treatment, and disposal must be available and periodically submitted to regulatory authorities.

Hazardous wastes that are also radioactive or that contain radioactive constituents are considered mixed wastes and such wastes must also meet RCRA/HSWA requirements. Mixed waste findings are discussed in Section 3.5.16. RCRA also regulates underground storage tanks (USTs).

Discussion of the corrective action requirements under RCRA for solid waste management units is included in Section 3.4.3. Groundwater monitoring requirements are discussed in Section 3.4.10.

Division 3211 operates a hazardous waste collection program and also operates a facility where the collected hazardous wastes are repackaged and stored for offsite treatment, recycling, or disposal. Most of the hazardous waste generated at SNL is in "small" quantities (i.e., 1 gallon or less per container). The waste-generating organizations are responsible for meeting the following requirements for managing their wastes before collection.

* All potentially hazardous (but not mixed radioactive) waste must be disposed of through Division 3221 by submitting a Chemical Waste Disposal Request form to Division 3221 for pickup of the wastes. Potentially hazardous wastes include, <u>but are not limited to</u>, chemicals, solvents, solutions with $12.5 \leq pH \leq 2$, oils, explosives, reactives, and toxic materials.

* All potentially mixed hazardous and radioactive waste must be disposed of through Division 3222 by submitting a Radioactive and Mixed Waste Disposal Request form to Division 3222.

* Potentially hazardous, radioactive and/or mixed materials must not be sent to reapplication nor placed in normal trash containers without the prior written approval of Division 3221 or 3222.

* All containers used to accumulate potentially hazardous waste must be marked with the accumulation-start date, the contents name or description, and the words "Hazardous Waste." A separate label is used for mixed waste. The containers must be kept closed except when adding or removing wastes.

* Waste must not be accumulated for more than 60 days nor in excess of 50 gallons before immediately requesting pickup of the wastes by Division 3221 or 3222. Exceptions to this requirement are allowed for interim status permitted mixed waste storage facilities.

Division 3221 is responsible for proper waste collection, repackaging, storage, transportation, and disposition, including permitting, manifesting, and reporting.

The storage facility is operated under an interim status permit from the State of New Mexico. A Part B permit application has been submitted to the State and is in the review process. A small thermal treatment facility is also operated under interim status for the burning of materials contaminated with light-initiated high explosives.

TTR has a less-than-90-day hazardous waste storage facility operated by the Reynolds Electrical and Engineering Company (REECO), whose personnel operate the facility and arrange for the waste disposition, including manifesting.

KTF is a conditionally exempt small generator and transfers its small quantities of potentially hazardous waste to the Pacific Missile Range Facility for disposition.

3.4.7.2 Significant Findings

Finding SF-R-01 [Reference APR-R-01]

SNL needs to conduct an inventory of classified materials, currently in use or storage, to assess their potential for becoming classified hazardous waste when they are no longer needed. SNL also needs to secure facilities to declassify or process the waste into a form acceptable for DOE-approved treatment or disposal.

Discussion

With the foreseen reduction in the need for nuclear weapons, a number of stored classified weapons components or returned components may become waste that may contain hazardous materials. An inventory of such components is needed to assist in the planning for requests for facilities to declassify or process the wastes so they are acceptable for shipment to DOE-operated or DOE-approved treatment or disposal facilities.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-R-02 [Reference APR-R-02]

DOE needs to improve communication of its plan to develop a system throughout the complex designed to declassify or treat and dispose of classified hazardous waste so as to avoid uneconomical duplication of efforts at its various facilities.

Discussion

Because the problem of managing future unneeded or returned weapons components is going to be a DOE Weapon Complex-wide problem, the DOE should provide more information on planning for complex-wide projects and facilities to manage the weapon components.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-R-03 [Reference APR-R-03]

Some USTs are in noncompliance, and prompt action needs to be taken to bring them into compliance and prevent several others from falling into noncompliance in December 1990.

Discussion

Due to a difference in the State of New Mexico and EPA regulations for USTs, some of SNL's USTs fell into noncompliance when the state remediation schedule was changed in favor of the EPA's schedule. The new schedule has also placed several other USTs in danger of falling into noncompliance in December 1990.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-R-04 [Reference APR-R-4]

There is a need to increase and improve the waste minimization program to meet the requirements of DOE Orders 5400.1 and 5820.2A.

Discussion

SNL lacks a formal program to reduce hazardous waste generation as required by DOE Orders 5400.1 and 5820.2A. Among other items, SNL lacks a formal waste minimization plan and process, including structure and statement of goals.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding WM/CF-1).

3.4.7.3 Action Plan Requirements

APR-R-01. An inventory of potentially classified hazardous waste needs to be conducted. Division 3221 will provide the lead role to conduct and document the inventory in conjunction with line organizations. Facilities for declassification and processing are also needed and are currently included in

the FY94 Integrated Waste Management Complex line-item construction request being developed by Department 3220.

APR-R-02. A plan is needed to involve SNL with DOE's planning to manage materials that will become classified hazardous waste.

APR-R-03. A UST compliance plan is needed. Division 3221, in conjunction with Directorate 7800, is implementing a project to bring the noncompliant USTs into compliance and prevent any other UST noncompliances after December 1990.

APR-R-04. An action plan is needed to address full funding to meet SNL's Waste Minimization Implementation Plan, which includes the formation of a Waste Minimization Network (MinNet) to spearhead the minimization of hazardous materials use and waste generation. The reissuance of the ES&H policy needs to state clearly that minimization of hazardous materials use and waste generation is a priority and high-leverage mechanism for improving health protection and ENV compliance. The MinNet needs to develop metrics for measurements of their effectiveness. Additional resources should be provided to MinNet where justified to improve its effectiveness.

3.4.8 Safe Drinking Water Act

3.4.8.1 Overview

The Safe Drinking Water Act (SDWA) is the legislative vehicle for regulating the discharge of nontoxic and toxic pollutants into groundwater by residential, municipal, and industrial sources. The goal of the act is to preserve the quality of the nation's groundwater for agricultural and drinking water use. The SDWA also regulates the quality of water used for personal consumption; those drinking water requirements are covered in the industrial hygiene program.

Individual states are given responsibility by the EPA for developing programs and procedures necessary to ensure that the quality of the groundwater meets the standards set by EPA. When notified of an intended discharge, states set standards for allowable concentration of pollutants in the discharge as well as requirements for monitoring and reporting.

SNL, Albuquerque, discharges wastewater to septic systems, lagoons, seepage pits, and the ground surface. Stormwater is discharged to the Tijeras Arroyo and to the KAFB impoundment.

Part of Areas I, II, and IV, and all of Areas III, V, and the Coyote Test Field discharge their sanitary waste to septic systems. A new sanitary sewer is currently being constructed that will replace some of the septic systems in Area III and the Coyote Test Field.

Within SNL, Albuquerque, TTR, and KTF, discharge of wastewater or other waste materials to a storm sewer, arroyo, waterway, septic system, lagoon, seepage pit, or the ground surface, except for uncontaminated precipitation, is prohibited unless written approval has been obtained from Division 3221. Water used for beneficial purposes (e.g., lawn watering) does not need approval.

3.4.8.2 Significant Findings

Finding SF-SD-01 [Reference APR-SD-01]

Lack of clarity in the term "waters of the United States" leads to confusion about the need for National Pollutant Discharge Elimination System (NPDES) permits or state discharge plans for wastewater discharges that may reach arroyo tributaries.

Discussion

There is confusion over the applicability of "waters of the United States" when applied to tributaries of large arroyos, and a clearer understanding is needed, as discharges to United States waters may need NPDES permits while other surface discharges may need state approvals.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-SD-02 [Reference APR-SD-02]

There is a need for a program to monitor discharges to septic tank sewage systems.

Discussion

There is currently no program to periodically monitor discharges to septic tank sewage systems to verify that improper discharges are not occurring.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-SD-03 [Reference APR-SD-03]

Very low levels of radioactive materials are being discharged to the soil in Area V, and although it is currently proper, a process needs to be developed to cease this discharge.

Discussion

While the discharge of very low levels of radioactive wastewater to the soil meets applicable requirements, DOE Order 5400.5 directs the cessation of such discharges as soon as practicable.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-SD-04 [Reference APR-SD-04]

There is no procedure to ensure that discharges to septic systems, lagoons, seepage pits, or the ground surface have been approved by Division 3221.

Discussion

Discharges to septic systems, lagoons (lined or unlined), seepage pits, and other subsurface or surface soils may require state approvals. There is no system to ensure that proper approvals are obtained through Division 3221.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.8.3 Action Plan Requirements

APR-SD-01. A plan is needed to improve the understanding by Division 3221 and Department 4010 of the factors that differentiate between the need for NPDES permits and State discharge plans.

APR-SD-02. A plan needs to be developed to establish the type, frequency, and locations of septic tank sewage monitoring efforts within SNL and the resources required for this effort.

APR-SD-03. A plan needs to be implemented to use a new sewer line being constructed to Area V to accept very low level radioactive discharges. The Area V sanitary flows need to be segregated from the potentially radioactive flows, and a system needs to be constructed to temporarily store the potentially radioactive flows to verify POTW acceptability before discharge to the sanitary sewer system.

APR-SD-04. A procedure needs to be devised to ensure that dischargers to septic systems and subsurface or surface soils (whether lined or not) are aware of and comply with Division 3221 discharge approval requirements.

3.4.9 Toxic Substances Control Act

3.4.9.1 Overview

The Toxic Substances Control Act (TSCA) provides the regulatory vehicle for controlling exposure and use of raw industrial chemicals that fall outside the jurisdiction of other environmental laws. While other environmental laws control chemicals during use and disposal, TSCA was passed primarily to assure that chemicals would be evaluated before use to make sure they pose no unnecessary risk to health or the environment.

Under the TSCA, chemical manufacture, use, import, or disposal may be banned, controlled, or restricted.

The TSCA provides for the listing of all chemicals that must be evaluated before manufacture or use in the United States. Processes that result in new chemicals from the interaction of other chemicals need to be examined. The new chemicals may need toxicological evaluations before being used in a manufacturing process.

The TSCA requires the evaluation of toxic substances hazards in the workplace and an evaluation and recording of all employee complaints and concerns related to toxic substances.

The TSCA also regulates the use, inspection, and disposal of PCB-containing materials and equipment. Only the PCB portion of TSCA is covered in this environmental protection section.

Items and fluids at SNL containing 50 or greater ppm of PCBs must be labeled, inventoried, periodically inspected, and properly disposed. An inventory of items that may potentially contain PCBs has been conducted. At SNL, all items containing PCBs from 2 to 50 ppm are also disposed through Division 3221 because of continuing potential liability under CERCLA, even for items and fluids containing less than the TSCA lower regulatory level of 50 ppm PCBs.

3.4.9.2 Significant Findings

Finding SF-T-01 [Reference APR-T-01]

Interactions between Divisions 3221 and 7816 need to be increased to ensure PCB compliance.

Discussion

Divisions 3221 and 7816 have central roles in the PCB compliance program. Their interaction level is insufficient to ensure that all of SNL's electrical distribution equipment is in full, documented compliance with PCB requirements.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-T-02 [Reference APR-T-02]

The ownership identity of electrical distribution equipment, which is associated with SNL activities, is not readily apparent to external inspectors.

Discussion

While the electrical distribution equipment within KAFB is assigned to various agencies and other organizations, the lack of ownership identification on all of the equipment may lead inspectors to conclude erroneously that SNL-owned equipment lacked PCB labeling and inventorying when, in reality, the equipment did not belong to SNL. Since Division 7816 has a list of all SNL-owned equipment, SNL ownership can be determined.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.9.3 Action Plan Requirements

APR-T-01. A plan needs to be developed to establish the lines of authority and responsibilities for coordinating PCB compliance activities and also to establish the interactions required to ensure full, documented compliance.

APR-T-02. A plan is needed to determine which SNL-owned electrical equipment needs ownership labeling, if any, and have the equipment labeled.

3.4.10 Groundwater

3.4.10.1 Overview

Groundwater protection is directly addressed by some of the requirements of the SDWA, RCRA, and CERCLA, and indirectly through the requirements of the CWA and the requirement for a Spill Prevention, Control and Countermeasures Plan (SPCC).

DOE Order 5400.1 states that the groundwater resources shall be protected by implementing a groundwater monitoring program. Groundwater monitoring requirements specific to hazardous waste sites are listed in RCRA [40 CFR 264 and 265]. Groundwater monitoring requirements for the hazardous waste components in mixed waste are also addressed by RCRA [40 CFR 264 and 265] while the portion of mixed waste requirements dealing with radionuclides is

found in DOE Order 5820.2A. The requirements of 40 CFR 191.16 will apply if transuranic or high-level waste disposal is involved.

Groundwater monitoring strategy development, planning, and implementation at SNL, Albuquerque, are carried out by Division 3223.

All personnel at SNL, Albuquerque, and TTR are expected to follow the requirements of SNL's SPCC Plans as applicable to their site and operation.

3.4.10.2 Significant Findings

Finding SF-GW-01 [Reference APR-GW-01]

The SPCC Plan is not being fully implemented.

Discussion

Some tanks are still found at SNL, Albuquerque, that are identified within the SPCC Plan as needing secondary containment and do not yet have that containment. SPCC inspections are also not complete.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding SW/CF-2).

Finding SF-GW-02 [Reference APR-GW-02]

There is inadequate hydrogeologic information on the SNL, Albuquerque, TTR, and KTF sites to meet RCRA and DOE Order 5400.1 requirements.

Discussion

A complete hydrogeologic site characterization, as required by RCRA, a Groundwater Protection Management Program Plan, and a Groundwater Monitoring Plan are lacking for the SNL, Albuquerque, site. While the potentiometric surface on the west side of the Tijeras fault system is fairly well characterized, only limited data are available on the east side of the fault system. In addition, only limited data on the distribution of hydraulic conductivity in the saturated zone for the entire site are available, and thus confidence is lacking for predictions of the direction of groundwater flow.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding GW/CF-2).

Finding SF-GW-03 [Reference APR-GW-03]

There are no quantifiable criteria (metrics) to assess performance requirements and the regulatory status applicable to groundwater monitoring and decontamination efforts.

Discussion

The requirements applicable to groundwater monitoring and decontamination efforts conducted under RCRA regulations are only generally defined. Thus, the determination of the compliance status of groundwater monitoring and decontamination often becomes a matter of protracted discussion between SNL and regulatory personnel. The establishment of more metrics for assessing compliance would improve the efficiency of groundwater monitoring and decontamination efforts by establishing specific performance objectives that could be met by the most efficient methods available rather than by prescriptive methods.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.10.3 Action Plan Requirements

APR-GW-01. A plan is needed to fully implement the SPCC Plan.

APR-GW-02. A plan is needed to continue implementation of the following planned activities:

* The SNL regional hydrogeologic characterization program, which will use site-specific data and perform tasks to obtain additional data throughout the site for the purpose of providing a view of the hydrogeologic system (i.e., groundwater flow directions and rates) over the entire SNL area. Some ongoing and impending activities include: (a) expansion of the SNL monitor-well network to include wells to the east of the Tijeras fault system (to provide water level and water quality data); (b) surface geophysics studies to define the geologic structure, location of faults, and depth to water; and (c) acquisition and setup of a computer database.

* The ERP assessment work that will provide site-specific hydrologic and geologic data. Examples of work to be done include:

  - New monitor wells are planned for installation during 1991 at the Mixed Waste Landfill (MWL) and at the Liquid Waste Disposal System near Area V to supplement the current hydrogeologic characterization data on the west side of the fault system. Additional

hydrogeologic data will be obtained following the planned FY91 installation of monitor wells at some of the major septic tank areas east of the fault system.

- A comprehensive investigation of the groundwater flow at the Chemical Waste Landfill (CWL) site is planned. Data will be collected to enable the determination of the likely groundwater flow paths through the unsaturated and saturated zones. The adequacy of the CWL monitor-well network will be evaluated.

- A Corrective Action Plan for a detailed investigation of the trichloroethylene (TCE) plume detected at the CWL is currently being developed. The approach is to take a top-down strategy for identification of the plume and the pathways from the source. The source will be better defined, organics will be sampled in all phases (gas/water/organic), and the flow field will be characterized. The time frame for this work will be developed in agreement with the New Mexico Environmental Improvement Division (NMEID).

- Completion of the Groundwater Protection Management Program Plan and the Groundwater Monitoring Plan as required by DOE Order 5400.1.

APR-GW-03. A plan is needed to establish and provide resources to research and develop groundwater monitoring and decontamination metrics for presentation to regulatory agencies and other organizations influential in setting groundwater monitoring and decontamination standards.

3.4.11 Hazardous Materials Storage

3.4.11.1 Overview

The hazardous materials storage (HMS) program area is governed by portions of a number of laws, DOE orders, and other requirements, including CWA, OSHA, RCRA, NFPA, NESHAP, and TSCA. There is no single law, regulation, or DOE order that appears to contain the major requirements for the storage of hazardous materials.

Personnel with hazardous materials storage responsibilities are expected to conform to the various requirements found in applicable sections of laws, regulations, and DOE orders.

Additionally, at SNL, outdoor storage of hazardous materials for periods longer than overnight requires labeling or marking of the container contents, hazard class, and owning organization, and secondary containment for containers holding liquids.

3.4.11.2 Significant Findings

Finding SF-HMS-01 [Reference APR-HMS-01]

SNL lacks a uniform set of HMS requirements.

Discussion

There is a need for representatives from safety engineering, fire protection, industrial hygiene, health physics, environmental protection, and other organizations to jointly develop a uniform set of HMS requirements.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.11.3 Action Plan Requirements

APR-HMS-01. A plan needs to be developed to provide the resources to form a joint (ES&H and other SNL organizations) working group to establish uniform HMS requirements.

3.4.12 Management Controls

3.4.12.1 Overview

The management controls in ENV range from the establishment of a management framework and process by which ENV functions and requirements are implemented in a consistent and sustainable manner to obtaining information reflecting actual ENV performance to address areas where ENV performance does not meet requirements, commitments, and expectations. Management controls also embody the requirement for management leadership in ENV actions, especially in the allocation and prioritization of resources to meet ENV requirements.

The general responsibilities for ENV are contained in Sandia Laboratories Instruction (SLI) 2001. All SNL management is responsible for the implementation of actions, including resource allocations, within their own organizations to meet ENV requirements. Vice president Safety, Health, and Environmental Appraisal Committees (SHEACs) are responsible for the assessment of compliance with ENV requirements within their vice

presidencies. Each SHEAC assesses its own facilities in accordance with its determination of the potential hazards associated with those facilities. Facilities with higher potential hazards are to be assessed more frequently than lower-rated facilities. Each SHEAC is also responsible for disseminating the findings from its assessments to the appropriate personnel, within the vice presidency, for resolution. Directorate 3200 and Department 3220 are responsible for operating selected centralized ENV services and for providing advice and consultation on ENV matters. Department 4010 provides legal advice on ENV matters.

Division 3221 provides services and advice in the areas of hazardous waste, wastewater, waste oil, PCBs, USTs, and hazardous materials spill response. Division 3222 provides services and advice in the areas of radioactive and mixed waste. Division 3223 provides services and advice in the areas of environmental restoration, NEPA, SPCC, groundwater and air pollution. Waste minimization and environmental quality assurance are done under Department 3220.

Although the Management Controls program area was not specifically evaluated by the Tiger Team during its assessment of the environmental programs at SNL, Livermore, related findings were identified in the Tiger Team Management assessment.

3.4.12.2 Significant Findings

Finding SF-MC-01 [Reference APR-MC-01]

There is a lack of understanding by organizational managers of their full ENV regulatory compliance responsibilities and the ENV requirements to be met by their organizations.

Discussion

While the overwhelming majority of SNL management are supportive of environmental protection, there is a general lack of a clear recognition among management of their responsibility for full compliance with all ENV requirements applicable to their organizations. Rather, there is a widespread attitude of sincerely wanting to do the right thing but reluctance to follow detailed requirements where they do not seem to "make technological sense." There is also a tendency for the dismissal of potential ENV concerns as not really being subject to ENV requirements since any resulting environmental impact will be negligible or, in other words, an attitude of "no harm, no foul." There is also a tendency toward the belief that the urgency of national security projects takes precedence over timely compliance with the full detail of ENV requirements. The result of the foregoing attitudes and beliefs has been a

number of projects where compliance with the full detail of ENV requirements has not been given equal weight with their technical objectives, which, in turn, led to project schedule delays or noncompliances with ENV requirements. Examples include construction and project delays due to late starts of NEPA documentation, hazardous waste satellite accumulation stations not meeting regulations, and the need for emergency permits to burn waste explosives.

Finding SF-MC-02 [Reference APR-MC-02]

There is no effective system to assure that organizational managers are identifying and receiving information about the actual state of their organization's compliance with ENV requirements.

Discussion

The performance of the SHEACs has been inconsistent among the different vice-presidencies, and the ability of the SHEACs to perform their assigned role in ENV compliance appraisal is questionable.

Since SHEACs lack a formal appraisal mechanism and schedule, some SHEACs perform infrequent appraisals while others, most notably the 7000 SHEAC, perform more frequent appraisals and more formally address their findings. The unevenness in the SHEAC performances does not lead to assurances that all organizational managers are receiving timely and effective information from SHEAC appraisals of their operations.

Since there are no established requirements for formal ENV training or experience for SHEAC members nor are there any established requirements for participation by ENV professionals on SHEACs, there is no assurance that SHEACs have the expertise available during appraisals to recognize ENV compliance deficiencies.

Finding SF-MC-03 [Reference APR-MC-03]

SNL lacks documented clear responsibility for corporate ENV issues as defined by a designated officer of the corporation.

Discussion

While the SNL policy that all management is responsible for ENV for their organizations has a desired goal of making managers place emphasis upon ENV, the policy also may lead to a diffusion of corporate-level ENV concerns among a number of individuals without a "champion" to lead the resolution of the concerns. An example of such a concern is the unfocused corporate approach to waste minimization. While nearly all SNL employees support the

concept of waste minimization, a corporate officer leading the formalization of waste minimization as a corporate policy would add significantly to the importance of waste minimization at SNL.

Finding SF-MC-04 [Reference APR-MC-04]

SNL lacks a performance assessment element by which management can provide feedback to individuals on their ES&H-related performance.

Discussion

The annual individual performance evaluation and compensation review system at SNL does not specifically include ES&H-related performance as an evaluation and review element.

Rather, performance evaluations at SNL seem to focus very heavily on technical project performance, with infrequent, scant attention being given to ES&H considerations. Other methods for effective feedback of an individual's ES&H-related performance are also lacking. It is vital that SNL employees understand the importance of ES&H issues in their workplace and work activities, and that they receive timely, meaningful, and effective feedback on their ES&H performance.

3.4.12.3 Action Plan Requirements

APR-MC-01. A plan is needed to strengthen three basic areas:

* A strong policy statement, going beyond SLI 2001, which clearly states that ENV, along with safety and health, is SNL's top priority. Furthermore, the policy statement must make clear that full compliance with ENV requirements (i.e., the letter as well as the spirit) is mandatory.

* Improved understanding by SNL management and staff of general ENV requirements through increased and improved training.

* Stronger application of the NEPA process within SNL. The understanding and comprehensive application of the NEPA documentation process should lead to the consideration and resolution of most ENV compliance issues before new projects are initiated. An increase in the resources devoted to centralized NEPA consultation and review is also needed if the increased implementation of NEPA within the Laboratories is to be successful.

APR-MC-02. SNL needs to identify and support a strengthened ENV self-appraisal process as part of a revised ES&H self-appraisal system. The revised system needs to include appraisal schedules, ENV training and/or experience

requirements for appraisers, and a formal mechanism to disseminate and resolve findings. SNL also needs to establish an independent assessment organization containing ES&H professionals to provide independent assessments of ENV performance.

APR-MC-03. A more thorough evaluation of the benefits of designating a corporate officer for ENV issues is needed and, if the benefits justify it, designation of the corporate officer.

APR-MC-04. SNL must develop an employee performance assessment system that properly includes evaluation and effective feedback on ES&H-related performance.

3.4.13 Quality Assurance/Quality Control

3.4.13.1 Overview

Quality Assurance/Quality Control (QA/QC) needs to be an integral part of ENV activities to (1) establish and ensure the accuracy and validity of ENV data, (2) ensure the appropriate documentation of ENV activities and decisions, (3) establish mechanisms to identify nonconformances as early as possible for rapid correction, and (4) lead the way toward continuous self-improvement in ENV activities.

The SNL Quality Improvement Plan and the SNL ES&H Quality Program include environmental protection, in conjunction with safety and health, as a prerequisite to operations at SNL. Therefore, each organization at SNL, Albuquerque, is to include environmental protection, in conjunction with safety and health, as part of its quality plans and procedures.

Department 3220 also has a quality plan and incorporates QA/QC into its activities.

3.4.13.2 Significant Findings

Finding SF-QA-01 [Reference APR-QA-01]

There is no evidence of compliance to DOE Order 5700.6B in quality plans throughout SNL to ensure that environmental requirements are met.

Discussion

DOE Order 5700.6B establishes DOE's QA program. Most of the quality plans within SNL lack discussions and requirements for ENV-related QA as prescribed by DOE Order 5700.6B, including QA for laboratory procedures and procurement of ENV-related products and services.

Similar findings were identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding QA/CF-1, QA/CF-2, and QA/BMPF-1).

Finding SF-QA-02 [Reference APR-QA-02]

SNL lacks rigor in the implementation of the ENV portions of quality plans and procedures both within Department 3220 and other organizations within SNL, Albuquerque.

Discussion

While ENV is recognized as an important part of quality plans and procedures in some organizations, including Department 3220, both the lack of familiarity with QA/QC and the lack of trained personnel in QA/QC have resulted in a situation where insufficient rigor has been applied to the implementation of the ENV portions of quality plans and procedures.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-QA-03 [Reference APR-QA-03]

There is a need for increased and improved ENV records management and retention both within Department 3220 and other organizations within SNL.

Discussion

ENV records are very important for documentation of regulatory compliance, use in ENV-related legal actions, and reevaluations of previous ENV activities. The current Department 3220 records management system is inadequate to responsively support the aforementioned needs since many Department 3220 records are kept by individual staff rather than by the records center.

The lack of records transfer to the records center results in records being held without appropriate cataloging, records being misplaced, and records not being readily locatable due to confusion over the staff person holding any particular record. The Department 3220 records management center is also understaffed and operates with inadequate space, both of which compound the records management and retention problems.

Other organizations are also charged with the creation and retention of ENV-related records, such as the mass of materials processed in a function that emits a hazardous air pollutant. Contacts with such organizations indicate that many of the personnel within those organizations either do not keep records or have a poor understanding of their ENV-related records creation and retention responsibilities.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.13.3 Action Plan Requirements

APR-QA-01. A plan needs to be developed to establish the method by which the quality improvement effort of SNL will include meeting the ENV requirements of DOE Order 5700.6B.

APR-QA-02. SNL's quality improvement effort needs to recognize and plan to meet the need for increased rigor in the implementation of ENV quality requirements.

APR-QA-03. A plan needs to be developed to identify and provide the resources for Department 3220 to increase its records management capabilities to meet quality standards. The plan also needs to address how other organizations will be better educated to understand and meet their ENV-related records creation and retention requirements.

3.4.14 Radiation

3.4.14.1 Overview

The single most comprehensive requirement for environmental radiation protection is DOE Order 5400.5, Radiation Protection of the Public and Environment. Other requirements applicable to environmental radiation protection include those promulgated under the CWA, HMTA, SDWA, and CAA.

The major methods through which environmental and public radiation protection are accomplished by SNL are as follows:

* Wastewater discharges of radioactive materials, including those at TTR and KTF, must have the written approval of Divisions 3221 and 3222.

* Notification of air emissions of radionuclides, including those at TTR and KTF, must be made, in writing, to Division 3223 and approved before commencement of the discharges.

* TTR and KTF are responsible for meeting the applicable SNL requirements for the following three items. However, the processes are conducted by different SNL organizations.

- Radioactive and mixed waste disposal must be made through Division 3222.

- The release of radioactive materials to the public must have the written approval of Divisions 3221 and 3222.

- The transportation of radioactive materials must be done through Division 3222 or 3429.

3.4.14.2 Significant Findings

Finding SF-RA-01 [Reference APR-RA-01]

There is no formal, written program to document procedures to be followed to ensure that the transfer of property, including real estate, meets radioactive release limits.

Finding SF-RA-02 [Reference APR-RA-01]

There is no formal program to assess and limit, where needed, current access to ERP sites that might be radioactively contaminated.

Finding SF-RA-03 [Reference APR-RA-01]

There is no formal, written program to require documentation that air and water releases of radionuclides conform with applicable discharge requirements and that the radiological dose assessment methodology is appropriate.

Discussion

The fundamental problem associated with the application of DOE Order 5400.5 at SNL appears to be a lack of clear organizational ownership of the order within Directorate 3200. There are at least four Directorate 3200 organizations with important roles to serve in the implementation of the order. The Health Physics Division (3212) has the primary expertise within SNL for radiological health protection. The Radioactive and Mixed Waste Division (3222) has primary expertise within SNL for protection of the environment associated with the radioactive wastes generated by SNL. The Environmental Impact and Restoration Division (3223) has the primary expertise for radionuclide air pollution releases. The Hazardous Waste and Wastewater Division (3221) has primary expertise for radioactive wastewater releases and inspections of materials leaving reapplication. While a number of other organizations also have roles to serve in the implementation of the order, clear ownership of the order within Directorate 3200 needs to be established to provide the leadership role in carrying out the order.

These findings were not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.14.3 Action Plan Requirements

APR-RA-01. A plan needs to be developed to define the organizational ownership of DOe Order 5400.5 within Directorate 3200, and that organization needs to be provided the resources to take on the leadership role for implementation of the order. After the ownership and resource issues have been settled, the owning organization needs to issue a program document defining the roles and responsibilities of the line and support organizations needed to fully implement the order.

3.4.15 Soil/Sediment/Biota (Environmental Surveillance Monitoring)

3.4.15.1 Overview

DOE Order 5400.1 requires all DOE contractors to monitor their site environment and conduct effluent monitoring and environmental surveillance activities. Detailed requirements are contained in other DOE 5400-series orders, particularly DOE Orders 5400.5 and 5400.xy. Annual Environmental Monitoring Reports for each DOE site are required to be published every year and be available to the general public.

Environmental surveillance of soil, sediment, and biota is performed both to provide possible warning signs of any unrecognized environmental contamination and to document the lack of unacceptable environmental impact from SNL operations. The environmental surveillance activities and documentation within SNL are accomplished through the Department 3220 Environmental Monitoring Program, which issues annual environmental monitoring reports for SNL, Albuquerque, and TTR. SNL is not required to prepare environmental monitoring reports for KTF.

3.4.15.2 Significant Findings

Finding SF-SB-01 [Reference APR-SB-01]

There is a need to increase resources and planning to meet the environmental monitoring requirements of DOE Order 5400.1.

Discussion

The implementation planning to meet the environmental monitoring requirements of DOE Order 5400.1 is addressed in the Environmental Protection Implementation Plan (EPIP). However, the personnel and resources needed to implement the EPIP are lacking. Therefore, personnel and resources within SNL's Environmental Monitoring Program need to be increased to meet all of the requirements and deadlines set forth in DOE Order 5400.1.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-SB-02 [Reference APR-SB-01]

SNL does not have an "Environmental Monitoring Plan" (EMP) to integrate the rationale for and data from both operational environmental effluent monitoring and environmental surveillance monitoring at all sites.

Discussion

SNL needs to write an EMP by November 1991 as required by DOE Order 5400.1. Currently, SNL has only a draft EMP and an Environmental Monitoring Manual (dated December 1986). The draft program plan addresses basic elements for the EMP, and the manual describes procedures for sampling and analysis of environmental surveillance samples. The manual is outdated and needs to be revised.

According to DOE Order 5400.1, the EMP shall contain "the rationale and design criteria for the monitoring program, extent and frequency of monitoring and measurements, procedures for laboratory analyses, QA requirements, program implementation procedures, and direction for the preparation and disposition of reports." The design criteria include the rationale for selecting the locations, media, frequency, and analyses for both effluent and environmental samples. Also, a detailed pathway analysis that is based on a maximum expected radiological inventory (source term) and relative deposition and meteorological data should be implemented for each major source to meet the requirements.

The EMP shall identify and discuss two major activities: (a) effluent monitoring and (b) environmental surveillance. Obviously, the two activities are related to each other in terms of rationale and design. Currently, SNL's effluent monitoring is carried out by various organizations with little interaction among these different organizations. The environmental surveillance, although performed by one division, has very limited activities.

To design the EMP for SNL, Albuquerque, and TTR will initially take some effort in background data collection (since the Environmental Impact Assessment for SNL, Albuquerque, was published in 1975) and increased communications among all organizations that conduct effluent monitoring. An environmental assessment (EA) is being prepared for KTF that contains similar information. Secondly, a central organization will have to sort all the data collected and perform pathway analyses for all major environmental pollution sources. Finally, based on the results of the pathway analyses, the rationale and design of the monitoring plans for both effluent monitoring and environmental surveillance will need to be justified with respect to all requirements stated in DOE Orders 5400.1, 5400.5, and 5400.xy.

A similar finding was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding EM/CF-1).

Finding SF-SB-03 [Reference APR-SB-01]

SNL's surveillance sampling frequency does not meet the new requirements stated in DOE Order 5400.5 and draft order 5400.xy.

Discussion

Currently, SNL collects environmental surveillance samples once a year. However, annual sampling is inadequate according to the new requirements stated in DOE Order 5400.5 and draft Order 5400.xy.

The new DOE orders require a minimum of quarterly sampling (unless there is justification for not being able to sample) to demonstrate compliance. For vegetation samples, SNL, Albuquerque, may be able to justify sampling only one time each year. However, there are no reasons for not doing quarterly sampling for soil and surface water.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-SB-04 [Reference APR-SB-01]

SNL lacks pre-operational monitoring for new facilities or proposed facilities.

Discussion

DOE Order 5400.1 requires pre-operational monitoring for new or proposed facilities in order to characterize the surrounding environment before the impact from the new operation begins. The results of the pre-operational monitoring will serve as the true background for the new facility. Once the operation starts, any difference between the results of future samples and those of the pre-operational monitoring will be interpreted as the net impact of the operation.

Some SNL facilities did not have any pre-operational monitoring performed for them. Therefore, it is very difficult to compare the results of current monitoring with those of the "true background," since that determination was never made.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

3.4.15.3 Action Plan Requirements

APR-SB-01. An environmental monitoring program needs to be developed to comply with the DOE orders in the 5400 series. Both line and support organization roles, responsibilities, and resources for developing, implementing, and conducting the program are to be clearly established.

3.4.16 Radioactive and Mixed Waste

3.4.16.1 Overview

Radioactive and Mixed Waste (RMW) management is governed by DOE Orders 5820.2A and 5400.3 and, in the case of mixed waste, by RCRA and HSWA. Mixed waste must meet both radioactive waste and hazardous waste requirements.

3.4.16.2 Significant Findings

Finding SF-RMW-01 [Reference APR-RMW-01]

SNL lacks full compliance with RCRA requirements for mixed waste storage and, in particular, with the weekly inspection requirements.

Discussion

Because of an inconsistency between the radiation protection principle of "As Low As Reasonably Achievable" (ALARA) and the requirement for weekly inspections of mixed waste storage areas, not all mixed waste storage areas are being inspected every week. NMEID personnel have been informed of the situation and discussions are continuing with them on a mutually agreeable solution. Other possible noncompliances are being identified and corrected in areas such as labels, contingency plans, and records.

This finding was not specifically identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore.

Finding SF-RMW-02 [Reference APR-RMW-02]

There are no offsite treatment and disposal capabilities for mixed waste.

Discussion

There are no permitted facilities available to accept SNL's mixed waste for treatment or disposal, which places SNL in the position of having to store its mixed waste until such facilities become available. The small volume of mixed waste generated at SNL does not economically justify the construction and permitting of onsite treatment and disposal facilities. DOE is aware of the lack of facilities and is planning and developing facilities for use by all of its mixed waste generating operations.

Finding SF-RMW-03 [Reference APR-RMW-03]

There is no characterization of radioactive waste, mixed waste, and legacy waste to comply with RCRA requirements and disposal site criteria.

Finding SF-RMW-04 [Reference APR-RMW-03]

SNL lacks programs and facilities to prepare RMW for storage and transportation to treatment and disposal facilities.

Finding SF-RMW-05 [Reference APR-RMW-03]

There is no transuranic waste (TRU) certification program complying with the Waste Isolation Pilot Plant (WIPP) Waste Acceptance Criteria (WAC).

Discussion

SNL, Albuquerque, has a number of mixed waste containers for which adequate characterization is lacking to meet RCRA requirements for knowledge of the composition of stored wastes and the Waste Acceptance Criteria for disposal of TRU waste at WIPP. SNL also lacks the facilities needed to characterize and prepare the waste to meet DOE, EPA, and state radiation health protection requirements.

A finding related to the above four findings was identified by the Tiger Team during its assessment of the environmental programs at SNL, Livermore (Finding WM/CF-3).

3.4.16.3 Action Plan Requirements

APR-RMW-01. An action plan is needed to continue the discussions with NMEID personnel regarding mixed waste weekly inspection requirements until a resolution is reached. A plan needs to be developed to identify and correct other RCRA noncompliances at mixed waste storage facilities.

APR-RMW-02. SNL needs to consider the value of developing a strategy to assist DOE with mixed waste treatment and disposal. The use of SNL facilities to conduct demonstrations of mixed waste treatment methods is one possible component of such a strategy.

APR-RMW-03. SNL needs to develop a Radioactive and Mixed Waste Program to comply with RCRA and DOE Order 5820.2. Both line and support organization roles, responsibilities, and resources for developing, implementing, and conducting the program are to be clearly defined. The program also needs to include methods for the identification of required waste management facilities and strategy to work with DOE to secure the facilities and avoid uneconomical duplication of waste management facilities.

Chapter 4
Safety and Health

Chapter 4

Safety and Health Assessment

4. Safety and Health Assessment

4.1 Purpose

This safety and health (S&H) self-assessment was performed by selected members of the Self-Assessment Working Group (SAWG) in order to provide Sandia National Laboratories (SNL) management and the Department of Energy (DOE) Tiger Team with information pertaining to the current S&H compliance status of the SNL, Albuquerque, facility (including Tonopah Test Range (TTR) and Kauai Test Facility (KTF)), together with requirements for rectifying findings of noncompliance.

4.2 Scope

This S&H self-assessment addresses all performance objectives set forth in the 20 program areas defined in the April 1990 edition of the DOE manual entitled "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites." In addition, this self-assessment addresses the draft performance objectives prepared by the DOE for the electrical safety, firearms safety, and worker safety and health compliance program areas. Based on the information gathered by the SAWG, significant findings applicable throughout the Laboratories have been identified, and action plan requirements have been prepared to address these findings. For organization-specific areas of noncompliance, local action plans have been prepared. All of this information contributed to the development of the key findings and root causes presented in Chapter 2 of this report.

4.3 Methodology

The S&H self-assessment process followed the overall methodology outlined in Section 1.4. Findings input sheets (FIS) pertaining to each TSA performance objective were distributed to a representative cross section of SNL, Albuquerque, organizations. Responses were reviewed and summarized by SAWG members, focusing on each of the 23 program areas. Follow-up interviews were held with personnel selected from all levels of management.

As a further means of validating the FIS responses, walk-throughs of selected facilities (such as the Area V reactors, the steam plant, Shipping and Receiving, the Microelectronics Development Lab, the Emergency Operations Center, and the pulsed power simulation facilities in Area IV) were conducted to independently assess safety compliance, observe operations in progress, and review procedures.

The SNL, Livermore, Tiger Team findings in each program area were carefully reviewed regarding their applicability to SNL. Numerous DOE orders and Occupational Safety and Health Administration (OSHA) standards, as referenced in the report sections that follow, were reviewed in order to supplement understanding and interpretation of the Technical Safety Appraisal (TSA) performance objectives. Based on all of this information, significant findings (comparable to "Concerns" as defined in the Tiger Team Guidance Manual) were formulated for each program area to address noncompliance, potentially hazardous operations, or improvements that would lead to excellence of operation.

Action plan requirements were prepared to address the findings in each program area. As noted in Section 1.4, these requirements are traceable to the specific action plans contained in the Action Plan Report.

4.4 Significant Findings and Action Plan Requirements

4.4.1 Organization and Administration

4.4.1.1 Overview

The organization and administration program area performance objectives stress the integration of environment, safety, and health (ES&H) into personnel duties, adequate administration of programs, enforcement of approved practices and procedures, management commitment and monitoring, job qualifications, and a useful information control system. A fitness-for-duty program is also essential.

At present, ES&H organization and administration practices are primarily determined by the ES&H Directorate (3200) and the Safety, Health, and Environmental Appraisal Committee (SHEAC) Council. The SNL ES&H Manual (SAND88-1161) is the primary guidance to the line from Organization 3200. The SHEAC Council distributes its information directly to the line via direct participation of each VP SHEAC chairman. The fitness-for-duty program as defined in DOE Order 5480.8, is controlled and administered by Directorate 3300.

The management team reviewed 252 FIS responses and interviewed the president, executive vice presidents and selected vice presidents, directors, and department managers at SNL, Albuquerque. The team also relied upon its personal observations and judgments developed during the self-assessment appraisal process. The team reviewed the SNL, Livermore, Self-Assessment and Tiger Team reports. Guidance was obtained from Secretary Watkins' July 31, 1990, memorandum "Guidance on Environment, Safety, and Health

Self-Assessments", and DOE Orders 5480.19 and 5482.1B. Additionally, Chapter 4.3 of the Tiger Team Guidance Manual (February 1990) was reviewed along with Section 1.5 of the DOE Environmental Audit Manual, the DOE TSA reference manual (April 1990) and Attachment 1 to the DOE document entitled ESH&QA Management Appraisal Program Development (September 11, 1989). The team also reviewed an Assessment of Regulatory Compliance of ES&H Programs at SNL, Albuquerque, Chapters II and III, prepared by IT Corporation, July 1990.

4.4.1.2 Significant Findings

Finding SF-OA-01 [Reference APR-OA-01, APR-KF-01, APR-KF-03, APR-KF-08]

SNL does not have an adequate, organized, formal, controlled organization and administration program for ES&H. (OA.01, OA.02, OA.06, OA.07)

Discussion

At the time of this assessment, SNL ES&H activities were overseen and directed by the ES&H Directorate (3200), the line SHEACs, and special committees covering explosives safety, nuclear reactor safety, and pressure safety. This process was relatively informal, primarily based on the SNL ES&H Manual (SAND88-1161) and the concept of hiring very good people and making them responsible.

Personnel involved in hazardous operations generally recognize they are responsible for safety, but this responsibility is generally not part of their formal job requirements. In general, there are no position descriptions, including ES&H responsibilities, for line personnel. Interaction with the knowledgeable personnel in Directorate 3200 is inconsistent. The controls to ensure that ES&H policies are adequately administered are informal; hence there are few methods available to monitor, track, and assess performance.

Finding SF-OA-01 addresses the issue of an adequate management system; hence it covers a wide variety of issues. The SNL, Livermore, Tiger Team findings and concerns that relate to this finding are Key Concerns SHK-2 and SHK-3; Key Findings MK-1, MK-2, MK-3, and MK-5; Root Causes R-1, R-2, R-3, and R-4; Findings M-1, M-2, M-4, M-5, M-6, M-7, M-9, and M-10; and Concerns OA.1-1, OA.1-2, OA.3-1, and OA.5-1.

Finding SF-OA-02 [Reference APR-OA-02, APR-KF-02]

The intent to operate safely is generally understood and accepted, but SNL is lacking in visible management support, formal methods to ensure compliance, and methods to monitor and assess compliance. (OA.03, OA.04, OA.05)

Discussion

The philosophy that SNL is to operate safely is often stated by management and is generally accepted. The formal statement of policy is contained in the Corporate Policy Statement, Chapter 1, of the SNL ES&H Manual. The SNL management style has not been to strongly reinforce this policy and philosophy by providing effective, knowledgeable leadership, including frequent involvement in the safety assurance process and a visible onsite presence at all levels.

The primary method to ensure ES&H compliance is via the SHEAC review process with informal and varied support from Directorate 3200. This process is basically informal, under local VP control through audit-type reviews. The SHEAC review has no formal procedure that ensures all areas of potential hazard are assessed. There are no systems throughout the Laboratories to ensure compliance, monitor SHEAC performance, or track line resolution of issues.

Finding SF-OA-02 addresses the issue of an adequate management system; hence it covers a wide variety of issues. The SNL, Livermore, Tiger Team findings and concerns that relate to this finding are SHK-2 and SHK-3; Key Findings MK-1, MK-2, MK-3, and MK-5, Root Causes R-1, R-2, R-3, and R-4; Findings M-1, M-2, M-4, M-5, M-6, M-7, M-9, and M-10; and Concerns OA.1-1, OA.1-2, OA.3-1, and OA.5-1.

Finding SF-OA-03 [Reference APR-OA-03]

The fitness-for-duty program has been partially developed for a long time. It still needs significant improvement. (OA.08)

Discussion

The fitness-for-duty programs for drugs and alcohol are generally perceived to be in good shape. Those for physical or psychological conditions are less well developed. The line supervisor is the primary person in the implementation of these policies. They are usually trained upon promotion, but there are no continuing training programs. The policies relating to contractors and visitors are not clearly spelled out. There is a need to put the program on a more formal, documented basis and add an improved data collection and analysis program to include tracking and trending. Significant finding OA.03 on fitness-for-duty does not have a corresponding SNL, Livermore, key finding.

4.4.1.3 Action Plan Requirements

APR-OA-01. A consistent, hierarchical structure of policies, programs, and procedures is needed to ensure uniform rigorous compliance with ES&H requirements. The focus should include increased formality of operations, line

responsibility, integration of Directorate 3200 expertise, documentation, assessments, data analysis, performance tracking, and communications.

APR-OA-02. A process is required to educate management personnel about the seriousness of ES&H and their role in selling and assuring the ES&H culture. A self-appraisal program is required, with appropriate data collection, analysis, identification of trends, including root cause analysis.

APR-OA-03. Formal, comprehensive documentation of the fitness-for-duty program is required, including considerations of safety- and security-sensitive positions. The appropriate training program should be developed and implemented. Visitor and contractor issues must be addressed. In addition, the program needs to be implemented with the addition of an improved data collection and analysis program, to include tracking and trending.

4.4.2 Quality Verification

4.4.2.1 Overview

The quality verification appraisal program area addressed all seven of the performance objectives set forth in the TSA manual. These performance objectives are the basic elements of a quality assurance (QA) program: administrative programs and controls; control and inspection of procured material and processes; and control, inspection, and calibration of tools, gages, and other instruments. We also considered the following source documents: DOE Order 5480.1B (ES&H Program for Department of Energy Operations), DOE/AL Order 5700.6B (Quality Assurance), DOE Order 5480.19 (Conduct of Operations for DOE Facilities), and DOE Order 5482.1B (Environment, Safety, and Health Appraisal Program).

The quality program at SNL, Albuquerque, is centered in two organizations: Directorate 7300 (Quality Improvement) and Directorate 7200 (Systems Evaluation). As the organization names imply, Directorate 7200 is focused on evaluating the quality of SNL's primary product, nuclear weapons, and Directorate 7300 is chartered to establish procedures for general quality improvement of SNL business processes. Responsibility for ES&H-specific quality assurance rests in Department 3220.

SNL instituted a quality awareness program throughout the corporation in 1989. A formal Quality Improvement Plan (QIP) is under development and is expected to be implemented in 1990. This plan will supersede the current Quality Plan (unnumbered) dated April 1986. Subordinate QA plans will be developed for specific organizations and activities (including ES&H) under the umbrella of the QIP. The ES&H quality plan is being written by Department 3220.

The assessment of quality verification was conducted as outlined in Section 1.4 of this report. One hundred and fifty-two FIS responses were studied. Additional data were gathered by interviewing management personnel in the Quality Evaluation and Quality Improvement directorates. Interviews were also conducted with DOE/AL quality managers.

SNL did not have an ES&H-specific QA program at the time of the assessment. We therefore evaluated both the draft QIP as well as the draft ES&H Quality Program.

4.4.2.2 Significant Findings

Finding SF-QV-01 [Reference APR-QV-01]

SNL does not have an ES&H quality program in place. Line organizations are not aware of the procedures required to come into compliance. Management, including quality professionals, have insufficient understanding of DOE requirements and are responding to Tiger Team criticism of other facilities rather than the fundamental requirements of DOE Orders 5480.1B and 5700.6B. (QV.01 through QV.07)

Finding SF-QV-02 [Reference APR-QV-02]

Neither SNL nor DOE/AL consistently audits for quality performance. The auditing department has done "special studies" at the request of line organizations. Only two such studies have been done since 1987 and the follow-up is at the discretion of the organization being audited. The former Systems Evaluations Directorate (currently the Process Quality Division) audited the Environmental Safety and Health Department (3310) between 1981 and 1987, but did not evaluate activities in the line organizations. DOE/AL had scheduled two quality audits for 1990. No evidence could be found that these audits were performed. The lack of regular audits implies lack of compliance with DOE Order 5482.1B and AL Order 5700.6B. The latter requires "independent verification of quality attainment, and program effectiveness." (QV.01)

Finding SF-QV-03 [Reference APR-QV-01]

SNL's draft ES&H and corporate quality plans do not follow the policy objective of DOE Order 5700.6B, which requires that the primary emphasis be on achieving "a high degree of operational success" (paragraph 7). These plans seek implementation of ANSI/ASME NQA-1 (Quality Assurance Requirements for Nuclear Facilities). ANSI/ASME NQA-1, however, is optimized for operation of engineered facilities and is not a broadly applicable "recognized standard." (QV.01)

Finding SF-QV-04 [Reference APR-QV-03]

SNL purchasing procedures separate authority and responsibility, and require that each requester be a market specialist. Since requesters are not market specialists, do not follow formal procedures, and are not under a QA program, the overall purchasing process is not in compliance with the best management practices of AL Order 5700.6B. (QV.02)

Finding SF-QV-05 [Reference APR-QV-04]

SNL has no procedure throughout the Laboratories for identification of ES&H systems requiring calibration, tagging, and inspection. (QV.04, QV.05, QV.06)

Finding SF-QV-06 [Reference APR-QV-05]

SNL has no procedure throughout the Laboratories to define and identify special processes. Personnel involved in special processes are not aware of TSA performance criteria. SNL has not implemented a QA program throughout the Laboratories for special processes. (QV.07)

Finding SF-QV-07 [Reference APR-QV-06]

SNL has no information management system throughout the Laboratories to control ES&H information, communication, and documentation. Numerous uncoordinated databases are being developed by individual organizations with no effective communication between database managers. (Best Management Practice)

Discussion

SNL is currently undergoing a major revision to the SNL Quality Plan, dated April 1986, which was written in response to DOE Order 5700.6A, dated August 13, 1981, and AL Order 5700.6B, dated April 24, 1984. A revision to include the changes necessitated by DOE Order 5700.6B, dated September 23, 1986, was written, but was deferred in favor of the new SNL QIP. The QIP is intended to include a method of implementing of the new quality culture that began development in the summer of 1989.

The QIP is documented in three tiers. Tier 1 is the overall philosophy document. Tier 2 is an organization quality plan addressing the 18 elements of ANSI/ASME NQA-1, the 33 Malcolm Baldrige Award Criteria, the 18 elements of DOE Order 5480.19, and the eight SNL Quality Improvement Elements. In addition, a separate ES&H quality program is being developed under the umbrella of the QIP throughout the Laboratories.

We are concerned that SNL's developing quality management system may not enhance the operational success of our ES&H program. The current draft operational procedures appear to be unworkably complex, not cost-effective,

and do not contain metrics that will detect deficiencies. It is unlikely that the quality management system will enhance "quality, productivity and cost-effectiveness" of the ES&H program as required by DOE Order 5700.6B. The QIP appears less functional than the current SNL Quality Plan, dated April 1986.

The above concerns lead us to believe that the current approach to QA/QV compliance should be reexamined in light of the policy of DOE Order 5700.6B (paragraph 7). SNL needs to develop a simple, goal-oriented approach to ES&H that genuinely enhances excellence, that emphasizes awareness, that incorporates the concept of "deliberate intent," and that contains ES&H-specific, performance-based metrics. Particular care should be exercised to avoid bureaucratic protection for indifference. Uniformity throughout the site should be achieved via similarity of principles and goals, not via blanket application of inappropriate or ill-suited procedures. Formality should not be confused with complexity.

Comparison of the SNL self-assessment with the Tiger Team report for SNL, Livermore, reveals close similarity of findings. SNL, Livermore, has no ES&H QA/QV program and is, therefore, not in compliance with DOE Order 5480.1B or the best management practices described in the TSA manual. In both cases, a lack of procedural formality is broadly evident.

4.4.2.3 Action Plan Requirements

APR-QV-01. A QA plan needs to be developed based on the policy guidelines of DOE Order 5700.6B. It should include the following tasks:

* Perform a survey to determine activities (e.g., operation of nuclear and nonnuclear engineered facilities) appropriately controlled by ANSI/ASME NQA-1.

* Survey and categorize all ES&H activities that are not adequately controlled under ANSI/ASME NQA-1. Identify and evaluate recognized standards and QA methods used by other laboratories engaged in similar activities.

* Develop concise, written instructions to selectively and judiciously apply the above standards where appropriate. Human factors should be considered to guarantee that the plan is workable and genuinely enhances the operational success of the activities being controlled. Plans should emphasize formality, written documentation, auditability, and performance metrics, but should not confuse these requirements with complexity. Plans should incorporate the concept of "deliberate intent" to maintain a safe, environmentally benign workplace.

* Develop custom QA plans for activities not covered by recognized standards.

* Document reasons for any noncompliance with ANSI/ASME NQA-1 as required by AL Order 5700.6B.

APR-QV-02. A performance-based auditing system needs to be developed consistent with DOE Order 5482.1B to ensure that the QA program enhances the operational success of ES&H activities. A lessons-learned program needs to be developed, and the information gathered needs to be used to revise QA procedures and to eliminate ineffective procedures.

APR-QV-03. Revise purchasing procedures to guarantee that ES&H products and services meet applicable procurement requirements and are appropriately inspected. Establish a lessons-learned program for purchasing to aid in the development of new procedures to guarantee quality products. Establish QA metrics for the purchasing process that enhances product reliability.

APR-QV-04. Establish a procedure to identify ES&H-related systems requiring calibration, tagging, and inspection. Develop concise, written procedures for calibration, tagging, and inspection, including performance audits and lessons-learned procedures.

APR-QV-05. Establish a procedure to identify special processes that require special QA controls. Establish a QA program consistent with the TSA Manual performance criteria to assure ES&H excellence in special processes.

APR-QV-06. Develop a network-based ES&H information management system throughout the Laboratories. The system should:

* provide for uniform control of and employee access to all ES&H records

* provide tracking of ES&H tasks

* provide access to all applicable laws, regulations, orders, plans, programs, and procedures

* provide access to applicable technical information such as Material Safety Data Sheets (MSDS), resident specialists, etc.

* contain records necessary for QV, such as space ownership, safe operating procedures (SOPs), OPs, local quality plans, line ES&H representatives, and other individuals responsible for ES&H activities

* provide bulletin board and mail systems for reporting and exchanging information on ES&H concerns and for reference to new unusual occurrence reports (UORs), lessons-learned reports, relevant information from the DOE complex, etc.

* be accessible by ethernet, asynchronous and dialup systems

* be at least key-word searchable

4.4.3 Operations

4.4.3.1 Overview

The operations (OP) section of the TSA manual (April 1990) prescribes eight performance objectives. These objectives are intended to ensure that operations activities are effectively implemented and controlled (OP.01), safe and reliable (OP.02), documented, performed with due consideration for abnormal events (OP.03), performed with full knowledge of equipment and systems status (OP.04), supported by facility equipment (OP.05), performed by knowledgeable operators (OP.06), effectively maintained during shift changes (OP.07), and consistent with human factors considerations (OP.08).

In order to provide more specific requirements and guidelines for developing directives, plans, and procedures relating to the conduct of operations at DOE facilities, the Assistant Secretary for Nuclear Energy distributed the draft "Guidelines for the Conduct of Operations at DOE Facilities" in March 1990. This draft became official with the issuance of DOE Order 5480.19 in July 1990.

DOE Order 5480.19 has not been implemented at SNL. Instead, general policy at the Laboratories governing operations activities that affect safety and health are described in the SNL ES&H Manual (SAND88-1161) and, in particular, in Appendix C of "A Guide for the Preparation of Safe Operating Procedures" (SAND88-1162). These documents were written before DOE Order 5480.19, and they are deficient in meeting most of its requirements.

All eight of the operations performance objectives were evaluated as a part of this self-assessment process. The findings were derived from analyzing 211 FIS responses and follow-up onsite observations of a range of activities that fit the intent of applicability of the TSA manual as supplemented by DOE Order 5480.19. Facilities visited included the Emergency Operations Center (Building 801), the Headquarters Command Center (Building 802), Shipping and Receiving (Building 957), the 6000 Igloo Area, Pulsed Power Research (Building 961), Advanced Laser and Optoelectronics (Building 893), Advanced Fusing Development (Building 835), the Steam Plant (Building 605), and the Hot Cell Facility (Building 6580). In addition, the operations section of the May 1989 DOE TSA report (DOE/EH-0073) evaluated the SNL reactors, ACRR and SPR III, was reviewed for findings and concerns relevant to the present assessment.

4.4.3.2 Significant Findings

Finding SF-OP-01 [Reference APR-OP-01, APR-KF-03]

Management has not defined how the guidelines of DOE Order 5480.19 will apply to SNL activities. (OP.01)

Discussion

Both management and staff lack understanding of the requirements of DOE Order 5480.19 or its applicability to their activities. Generally, groups performing small-scale research and development did not perceive the applicability of the operations objectives to their activities. On the other hand, while the staff of more clearly operations-intensive activities, such as the Area V reactors and the Area IV pulsed power accelerators, recognize the requirements for formal conduct of operations and are working toward meeting them, these facilities fail to meet many of the operations objectives or comply fully with DOE Order 5480.19. When compared to the criteria of the TSA manual, deficiencies in documentation and formality of operations were frequently noted.

Of the list of 27 possible contributing factors that accompanied the FISs, the line organizations responded most often to two primary contributing factors for lack of compliance with the operations performance objectives: (1) lack of formality of operations and (2) inadequate communication of ES&H requirements and policies.

The line organizations also indicated, with somewhat fewer responses, a secondary set of important contributing factors, which included inadequate resources, inadequate ES&H training and education, a lack of a management process by which ES&H functions will be implemented in a consistent and sustainable manner, and unclear definition and delineation of ES&H responsibilities.

Further information was obtained from facility visits and interviews. Specifically, we found that supervisors and staff are personally committed to safe and environmentally sound operations and that they very much want to do the right thing, but they are frustrated by poorly communicated requirements, inconsistent implementation directives, and ineffective management leadership.

The SNL, Livermore, Tiger Team report noted a lack of job descriptions defining responsibilities and authorities for operation of tests, experiments, and utility equipment. The team expressed concern that management had not defined the required roles, responsibilities, and interfaces (Concern OA.1-1) and that the concept of formality in the conduct of operations had not been applied to tests, experiments, and utility operations (Concern OP.2-1).

Finding SF-OP-02 [Reference APR-OP-02]

The presently used method of conducting operations through the application of SOPs is not adequate to ensure that operational activities are safe and reliable. (OP.02, OP.03)

Discussion

SOPs generally lack considerations of technical specifications, a QA plan, or the expected impact on operations of abnormal conditions. The level of documentation, policy, and procedure SOPs provide is insufficient to meet the intent of these performance objectives or DOE Order 5480.19. In addition, examination of existing SOPs often revealed deviations from the requirements prescribed in SAND88-1162, such as undated signatures, unauthorized handwritten modifications, and out-of-date procedures. In addition, SOPs do not often include step-by-step operations procedures. Rather, separate procedures have been developed independently by line organizations to serve this function. There is no formal system throughout the Laboratories for the preparation, content, revision, or control of these line organization procedures. Other common deficiencies include the lack of a preventive maintenance program and the lack of adequate control over the activities of contractors working onsite.

The SNL, Livermore, Tiger Team report noted that personnel at the Laboratories were generally not familiar with the then-draft "Guidelines for the Conduct of Operations at DOE Facilities." The team also discovered numerous weaknesses in SOPs, including inconsistent implementation and lack of specific steps for conducting operations. The team expressed concern that the SOP system was not being effectively and consistently implemented (Concern OP.3-1), and that an integrated system for developing and issuing policies and procedures for safely operating systems and equipment did not exist (Concern OP.3-2).

Finding SF-OP-03 [Reference APR-OP-03, APR-KF-03]

Adequate procedures for logkeeping, status control, and status monitoring do not exist. (OP.04)

Finding SF-OP-04 [Reference APR-OP-03, APR-KF-03]

A lockout/tagout program throughout the site meeting the requirements of 29 CFR 1910.147 (DOE Order 5480.19, Chapter IX) does not exist. (OP.04)

Discussion

Observations indicated that the most common method of "status control" at SNL, Albuquerque, is the use of notations on yellow tape or post-its attached to any convenient surface. Generally, personnel were not familiar with the

requirements for logkeeping, labeling, lockout/tagout, or status control. Systems in place were informal, relying on individual initiative and interpretation rather than formal, documented procedures.

The SNL, Livermore, Tiger Team report noted that although lockout/tagout requirements became effective in January 1990, personnel were not familiar nor in compliance with the guidance. They expressed concern that the required lockout/tagout system had not been implemented and that other tagging methods had not been formalized (Concern OP.4-1).

Finding SF-OP-05 [Reference APR-OP-04]

Facilities lack the cleanliness and orderliness conducive to safe and reliable operations. (OP.05)

Discussion

Both observations and responses to the FISs showed a general lack of good housekeeping practices. The onsite visits revealed many instances where the lack of cleanliness and order contributed to a higher potential for operation failures. For example, loose screws were found on top of an operating electrical equipment cabinet with an open top through which the screws could easily fall, and electrical signal cables for use in an experiment were being temporarily stored by looping them over valve handles such that pulling a cable down could unintentionally open the valve.

The SNL, Livermore, Tiger Team report did not identify any specific findings or concerns for this performance objective. However, the team did note that improvement in housekeeping was needed in some areas (e.g., Building 963).

Finding SF-OP-06 [Reference APR-OP-05, APR-KF-11]

Management has not established policies or procedures to ensure job-specific training, certification, or retraining. (OP.06)

Finding SF-OP-07 [Reference APR-OP-06, APR-KF-09]

A lessons-learned program throughout the Laboratories does not exist. (OP.06)

Discussion

In general, operator experience is valued above formal training. No formal, documented training program exists throughout the site. Staff are hired with technical degrees or experience commensurate with their initial job assignment. Management informally encourages the staff to update their training, but relies primarily on the staff's personal initiative to keep themselves appropriately trained as their job assignments change.

Accidents, near misses, or other abnormal events are investigated, analyzed, and reported through the line organization actually experiencing the problem. However, there is no formal system whereby useful lessons learned from these events are communicated to the staff of other line organizations that might benefit from this experience. In addition, abnormal occurrences throughout the Laboratories are not analyzed to determine the root causes throughout the site for corrective action.

The SNL, Livermore, Tiger Team report did not identify any specific findings or concerns for this performance objective.

Finding SF-OP-08 [Reference APR-OP-03, APR-KF-03]

No shift turnover procedures exist throughout the site to ensure adequate information transfer. (OP.07)

Discussion

Some operations (e.g., the steam plant) have no scheduled shift overlap, but informally rely on staff arriving a few minutes early or staying a little late to exchange information. Other shift operations, such as computer operations and security, have formal procedures for transferring information.

The SNL, Livermore, Tiger Team report did not identify any specific findings or concerns for this performance objective.

Finding SF-OP-09 [Reference APR-OP-03, APR-KF-03]

Human factor considerations are ignored for the conduct of many operations. (OP.08)

Discussion

The most common symptom of this finding throughout the Laboratories is the lack of proper labeling and control of operator information. As noted above in the discussion associated with Finding SF-OP-04, yellow tape and temporary notes constitute the normal method of communicating operator information.

The SNL, Livermore, Tiger Team report did not identify any specific findings or concerns for this performance objective.

4.4.3.3 Action Plan Requirements

APR-OP-01. Management must define how DOE Order 5480.19 will be applied to SNL activities.

A graded approach should be used in the application of the guidelines to assure that the depth of detail required and the magnitude of resources expended are commensurate with each activity's potential environmental, safety, and health impact. Conformance should be documented to indicate whether a specific guideline applies to an activity, how the guideline will be applied, and any deviations or exemptions from the guidelines.

APR-OP-02. The ES&H Directorate (3200) must develop a program to ensure that SOPs are prepared and implemented throughout the site in a uniform, effective, and consistent manner. As a minimum, this program must include the identification and graded characterization of operations for which SOPs are needed and a method to ensure that SOPs are uniform in format, content, review procedures, and approvals with a level of detail commensurate with the hazards posed by the operations to which they apply.

APR-OP-03. The ES&H Directorate (3200) must develop a program to implement Conduct of Operations (DOE Order 5480.19) at SNL. Such implementation should ensure adequate procedures for logkeeping, status control, status monitoring, lockout/tagout activities, shift turnover practices, and human factor considerations.

APR-OP-04. Line organizations must make good housekeeping a higher priority practice. Active management attention to this area is required (e.g., "management by walking around").

APR-OP-05. Line organization management must establish procedures to ensure that job-specific training, certification, and retraining are provided, taken, documented, and monitored as appropriate.

APR-OP-06. The ES&H Directorate (3200) must develop a lessons-learned program throughout the site that ensures effective analysis for root causes and adequate communication of accidents, near misses, and other abnormal events.

4.4.4 Maintenance

4.4.4.1 Overview

This self-assessment evaluated the maintenance (MA) program area against eight performance objectives: Organization and Administration (MA.01), Conduct of Maintenance (MA.02), Maintenance Facilities, Equipment, and Material (MA.03), Planning, Scheduling, and Work Control (MA.04), Corrective Maintenance (MA.05), Preventive Maintenance (MA.06), Predictive Maintenance (MA.07), and Procedures and Documentation (MA.08). All eight

maintenance program elements were evaluated through 145 FIS responses as well as through onsite observations and interviews. The input from the Research Organization (1000) was obtained directly from that organization's representatives on the SAWG. They decided not to distribute FISs to this group.

As noted below, maintenance policy, responsibilities, and authorities are unclear in some areas at SNL; however, traditional plant facility maintenance is performed by the Facilities Directorate (7800) and, in particular, by the Facilities Operations and Maintenance Department (7810). This department's activities are covered by SNL 6610-6 (Facilities Maintenance, Engineering, and Construction Services) and ten major SOPs. Applicable DOE orders include Order 4330.4 and its draft replacement 4330.xxx, Order 5480.19, and AL Order 5700.6B.

The formality of the maintenance activity relies heavily on the Automated Maintenance Management (AMM) system. The AMM system is a computer-based system that tracks all Maintenance Service Requests (MSRs) received from Facility Customer Representatives (FCRs), the telecon system, maintenance planners, and maintenance supervisors. The system issues work orders and is used, for example, to track maintenance backlog. It should be noted that presently its ability to store maintenance history data is not adequate in most areas to do trending and systematic analysis.

4.4.4.2 Significant Findings

Finding SF-MA-01 [Reference APR-MA-01]

The absence of a well-defined maintenance program for laboratory research and development (R&D) equipment has resulted in a lack of ownership and recognition of formal maintenance responsibility on the part of line organizations for their equipment. In particular, line R&D organizations do not know how the DOE orders regarding conduct of maintenance orders apply to them and their equipment. (MA.01, MA.02, MA.04, MA.08)

Discussion

The maintenance of R&D property, such as the lab instruments and apparatus, are not considered by the plant maintenance organization (Department 7810) to be part of its responsibilities (i.e., R&D instruments and equipment are not entered in AMM). Although Sandia Laboratories Instruction (SLI) 6610-2 provides some guidance in this area, line organizations who "own" such items either do not see DOE maintenance orders as applicable to them or feel they need corporate guidance on how to carry out responsibilities in this area. These organizations certainly did not look to the plant maintenance organization for

calibration and upkeep of their special apparatus and complex R&D instruments. The typical responses to maintenance questions asked of line organizations were: we fix things when they break or have a contractor come in to do it; we do not feel the rigor implied in the performance objectives is necessary to carry out our work.

This issue is not dealt with in detail in the SNL, Livermore, Tiger Team report. However, the third finding under MA.01 relates to maintenance of R&D equipment and the lack of complete records for subcontractor-performed maintenance on such equipment. The second finding under MA.02 refers to a similar issue.

Finding SF-MA-02 [Reference APR-MA-02]

There is a lack of ownership or recognition of formal maintenance responsibility on the part of the line organizations for space and facilities they occupy. (MA.01, MA.08)

Discussion

The responsibility of line organizations for space they occupy and adjacent common areas is at best fuzzy, as is evident in many of the FIS responses. There is an action in progress by Directorate 3600 to ensure that every square foot of SNL has an owner. However, even after this is complete, it will be necessary to further make explicit and document the responsibilities of owners in their spaces. Especially important will be how their responsibilities interface with those of Directorate 7800.

This issue was not directly discussed by the Tiger Team in the maintenance program area analysis at SNL, Livermore.

Finding SF-MA-03 [Reference APR-MA-03]

The plant maintenance organization lacks sufficient resources to carry out its responsibilities under DOE orders, particularly in the preventive and predictive maintenance areas. (MA.02, MA.04, MA.06, MA.07)

Discussion

Maintenance activities, in common with other areas, are not carried out with the rigor and formality decreed by various recent DOE orders (see Order 5480.19 and draft replacement Order 4330.xxx). The plant maintenance organizations feel they meet the performance objectives of the TSA "considering their resources," although further work is needed for "formal compliance." Additional resources will be required to move to full compliance. At present, the system works "in the breakdown mode"; that is, it is oriented to repairing broken or damaged equipment or facilities. As noted above,

Department 7810 has in place a computer-based system called AMM that tracks maintenance, both corrective and preventive, although adequate resources are not available to cover, at the appropriate intervals, the 50,000 preventive maintenance actions entered. The line departments and divisions are critical of plant support and maintenance activities and experience long (6- to 12-month) delays for modifications and corrective actions related to ES&H problems. Discussion with maintenance personnel made it clear that records are not adequate for a good preventive or predictive maintenance program to be developed.

The SNL, Livermore, Tiger Team Concerns MA.1-1, MA.4-1, MA.6-1, MA.7-1, and MA.8-1 all identified related issues that apply to SNL.

Finding SF-MA-04 [Reference APR-MA-04]

The plant maintenance organization lacks sufficient formality of operation as mandated by DOE orders. (MA.01, MA.02, MA.03, MA.07, MA.08)

Discussion

Among the issues contributing to this finding are (1) SNL lacks a clearly stated corporate maintenance policy (annual work plans are submitted to the DOE, and there is an SLI (6610-6) on maintenance and a Plant Maintenance Administrative Practices Manual, dated November 1987, but none of these constitute a corporate policy); (2) except in certain cases, pre- and post-job briefings are not performed; (3) an equipment and instrumentation calibration system including automatic recall is not uniformly implemented; (4) routine analysis of trends and root causes is not carried out; and (5) low-voltage lockout/tagout procedures are not uniformly documented and applied.

In the area of electrical maintenance, missing screws in panels, propped open junction box doors, and residual material left at repair or modification sites indicated inadequate attention to safe, formal, and efficient procedures. An onsite inspection at Building 6587, the maintenance shops serving Areas III and V, made it clear that housekeeping is a problem in and around this maintenance facility at least.

These findings reflect the findings and concerns of the Tiger Team in the maintenance program area at SNL, Livermore.

Finding SF-MA-05 [Reference APR-MA-05]

The plant maintenance organization is restricted from applying an effective graded approach to its activities since it does not have clear and authoritative information regarding the identification of systems considered critical to safety in major facilities. (MA.01, MA.02, MA.04, MA.08)

Discussion

This finding arose during several interviews with managers and organizations. Some greater formality of requesting and providing this information is required so that Department 7810 can carry out its function more effectively.

This issue was identified as a finding under MA.01 in the SNL, Livermore, Tiger Team report.

4.4.4.3 Action Plan Requirements

APR-MA-01. A program needs to be defined by Department 7410 with support by Directorate 7800 and representatives of the line R&D organizations to provide corporate guidelines for the maintenance of R&D apparatus and instruments in accordance with DOE orders on conduct of maintenance and sound practices in this area. The program then needs to be implemented throughout the Laboratories.

APR-MA-02. A corporate policy needs to be prepared and implemented concerning the responsibility of line organizations for maintenance of the space and facilities they occupy. This policy should be drawn up by a group led by the Facilities Engineering Directorate (7800) and include representation from line organizations.

APR-MA-03. A top-management-led committee, including representation from Directorate 7800, should be formed to arrive at the level of resources required to carry out the facilities maintenance activity with sufficient rigor and formality to come into compliance with DOE Order 4330.xxx. This committee should then recommend appropriate levels of increased support to the SNL Management Council. This committee should receive input from the group carrying out APR-MA-04.

APR-MA-04. Directorate 7800 should form a task force to study DOE orders concerning formality of operations and conduct of maintenance. This task force should create new maintenance policy for SNL facilities, determine any new systems required, and create an implementation plan, including the identification of resources required. This task force should then oversee implementation. The task force will require input from APR-MA-02 and will give input to the group formed under APR-MA-03.

APR-MA-05. A team consisting of several members of Directorate 7800 and representatives from major facilities should prepare a program to gather, store, act upon, and update information concerning the identification and maintenance of critical systems throughout the corporation. They should then oversee implementation of this program.

4.4.5 Training and Certification

4.4.5.1 Overview

The training and certification (TC) program area appraisal addressed all eleven of the performance objectives noted in the TSA manual. These performance objectives can be grouped into two major areas: those dealing with reactor operations and those that deal with general training objectives. The requirements for nuclear facility training are covered in DOE Orders 5480.5 and 5480.6. This assessment is based on the assumption that these orders cover all high-risk operations, but do not cover low-risk activities.

The training and certification activities at SNL are diffused. The Human Resources Directorate (3500) has primary responsibility for education and training programs. However, the line organizations perform a significant amount of the training at SNL. This observation is especially true in the case of reactor operator training, which is centered in the Reactor Development and Applications Department (6450).

The assessment of training and certification activities was conducted as outlined in Section 1.4 of this report. Additional data were gathered by interviewing management personnel in the Human Resources Directorate and management and operational personnel in the Reactor Development and Applications Department. The reactor operator training program is in basic compliance with the regulations. Some exceptions were noted in the most recent TSA of this facility (Ref. DOE/EH-0073). The ES&H training program, which covers the general training requirements, is currently being defined and its efficacy is yet to be determined.

4.4.5.2 Significant Findings

Finding SF-TC-01 [Reference APR-TC-01]

Training on safety subjects is ineffective because of a lack of hands-on instruction. Training on OSHA and environmental requirements is ineffective because of a lack of demonstration. (TC.01 through TC.11)

Finding SF-TC-02 [Reference APR-TC-02]

Tests cannot be used to determine suitability for employment; testing of union-represented employees takes place, but is ineffective because the tests are designed for all to pass. This policy reduces the effectiveness of the courses, as they are not taken as seriously as they should be. (TC.01 through TC.11)

Finding SF-TC-03 [Reference APR-TC-03]

A lessons-learned program using the experiences from the SNL UORs and from DOE and commercial reactor experience does not exist. (TC.02)

Finding SF-TC-04 [Reference APR-TC-04]

There are no certified reactor operators in line management. (TC.02)

Finding SF-TC-05 [Reference APR-TC-05]

There is no assurance that a person taking over a new assignment will be sufficiently trained or informed to perform his or her assignment safely and well. (TC.10)

Finding SF-TC-06 [Reference APR-TC-06, -07, -08, -09, -10]

A significant number of the line and management personnel are not aware of the training requirements for their own jobs.

Discussion

Department 7810 maintenance personnel have been trained to have the necessary knowledge and skills needed to perform assigned tasks (see Section 4.4.4 on maintenance). Initial skills are provided by the Maintenance Apprenticeship Program, which consists of 10,000 hours of on-the-job training and related courses. The high standards of training are maintained by the Joint Apprenticeship Committee, which evaluates course and training criteria as needed to meet the changing industry needs. The same standards apply when hiring outside of SNL. A five-year apprenticeship and five years of related experience is a prerequisite. The line supervisors are responsible for additional skills enhancement for specific systems or equipment (e.g., systems control, heavy tonnage chillers, or cranes-hoists). The maintenance training program does not include QA, quality control (QC), or emergency response.

Training for SNL management has been accomplished primarily by on-the-job training supplemented by general management and personnel relations courses, but these courses are not regularly scheduled and there is no formal process for selecting the students. Training specifically directed to train supervisors, managers, and technical staff on ES&H matters is now being developed, but is not in practice at this time. Training for specific jobs is essentially nonexistent or is performed on the job, and there is no process for certifying the efficacy of this on-the-job training. There is no formal change of command process whereby the new person is instructed about the condition of the organization or project, the safety issues or potential safety issues, or other important information. There is no program defining training requirements for new jobs.

The classrooms currently used for training (program element TC.07) are designed for lecture-type classes as opposed to hands-on instruction. When new classes are implemented, which employ more hands-on training techniques, new classrooms will be required.

Similar findings were identified by the Tiger Team during its assessment of the training and certification program area at SNL, Livermore (Concerns TC.1-1, TC.4-1, and TC.5-1).

4.4.5.3 Action Plan Requirements

APR-TC-01. Directorate 3500 should develop a program that will provide safety instruction using hands-on training and provide OSHA instruction using demonstrations or hands-on training, as opposed to the currently used classroom methods.

APR-TC-02. SNL should negotiate a contract modification with all unions that will allow testing of employees to certify proficiency with regulations and safety or environmentally important equipment.

APR-TC-03. SNL should establish a lessons-learned program that will provide instruction on issues and problems encountered in other DOE facilities as well as those lessons learned from analysis of our own UORs. Such instruction should include a significant root cause analysis, preferably using a workshop method.

APR-TC-04. Department 6450 should establish a management training program aimed at increasing the level of management awareness of the requirements for reactor operators.

APR-TC-05. A formal program should be established that will ensure a smooth and effective change of command when an employee or member of management takes over a job previously assigned to another employee. Such a program should ensure that all hazards are identified, all environmental issues are identified, and that training is provided to the new person before duty.

APR-TC-06. The training requirements, frequency of retraining, and criteria for legitimate certification for each type of skilled activity at the Laboratories need to be identified on a corporate level.

APR-TC-07. The training requirements for each employee's job need to be specified.

APR-TC-08. A program needs to be developed and implemented to provide any unmet, required training to on-role employees. These programs should include documented certification procedures when necessary.

APR-TC-09. A program needs to be developed and implemented to screen new hires for training needs. Provide the identified training (and certification if necessary) to the newly hired employees before they are allowed to perform their job.

APR-TC-10. A program needs to be developed and implemented for retraining and recertification as required.

4.4.6 Auxiliary Systems

4.4.6.1 Overview

The auxiliary systems (AX) program area deals with those systems that, when failing, could have an adverse effect upon personnel safety, the integrity of the facility, or programmatic performance. Certain elements of this program area deal with methods of handling and disposing of hazardous wastes and the procedures and techniques for the handling of fissile material. While a definition of "auxiliary systems" is not provided within the TSA manual, some program elements do address specific types of systems. These are ventilation, heat removal, vital supply (electrical, water, etc.) engineered safety, and coolant cleanup systems.

Responsibilities for the design, maintenance, and operation of these systems in some cases rest with the line organizations. The remaining systems fall under the purview of the Facilities Directorate (7800).

Eighty-three FISs were evaluated for compliance against the AX performance objectives. Discussions with line personnel and visits to some facilities constituted the remainder of the evaluation process.

4.4.6.2 Significant Findings

Finding SF-AX-01 [Reference APR-AX-01]

ES&H requirements are inadequately or incompletely defined, and are not communicated. (AX.01, AX.03, AX.05)

Discussion

The most prevalent criticism raised by the respondents to the performance objectives noted above was the seeming lack of consistent and authoritative answers at SNL to ES&H questions. Issues ranged from those dealing with solid and liquid waste handling and disposal, and to ventilation system performance requirements, and an uncertain definition of "auxiliary systems." Not surprisingly, the line organizations' interpretation of what constitutes an

"auxiliary system" varied significantly. Definitions ranged from redundant systems within a facility to systems required for experimental or test equipment but not intrinsic to that equipment.

Another significant uncertainty arose in the area of solid wastes. Respondents complained that existing documents related to hazard identification, handling, and disposal methods are diverse, fragmented, and uneven. Not even a clear definition of what is currently considered hazardous is available.

In the area of ventilation systems, most respondents felt that their system's performance was probably within specification. But again, the absence of clear and concise information precluded a better understanding of the DOE requirements for operation, maintenance, and documentation.

The Tiger Team found that SNL, Livermore, with the exception of the Tritium Research Laboratory, also was deficient in documented functional requirements for auxiliary systems (Concern AX.1-1).

Finding SF-AX-02 [Reference APR-AX-02]

Procedures and operations suffer from a lack of formality. (AX.01, AX.02, AX.03, AX.05, AX.06, AX.07, AX.08)

Discussion

In general, most organizations at SNL are, in principle, in compliance with safety requirements for their operations. However, the required degree of formalism inferred from the performance criteria is certainly lacking. Identification of formal programs, appropriate written procedures, and validation of practices (recordkeeping) must be instituted.

This was not an apparent issue in the Tiger Team assessment of the auxiliary systems program area at SNL, Livermore.

Finding SF-AX-03 [Reference APR-AX-03]

Staff are inadequately trained and educated on ES&H matters. (AX.01, AX.03, AX.05, AX.06)

Discussion

Although some training has been available on ES&H issues, it is perceived to be diverse, fragmented, and uneven; in short, inadequate. A formal training program providing clear, concise, and authoritative direction for each of the program area performance objectives is required (see also Section 4.4.5).

This was not an apparent issue in the Tiger Team assessment of the auxiliary systems program area at SNL, Livermore.

4.4.6.3 Action Plan Requirements

APR-AX-01. Programs should be written that will provide consistent and authoritative definition and guidance in the following ES&H-related areas:

* Definition of the term "auxiliary systems" to be applied to an R&D setting as opposed to a nuclear power plant or production facility.

* Provide a program that identifies solid hazardous wastes, disposal methods, and waste minimization techniques and goals.

* Provide a program that translates DOE orders to requirements for the operation and maintenance of ventilation systems that discharge potentially hazardous airborne effluents.

APR-AX-02. A program needs to be established to define the amount and degree of formality of operations and procedures for the systems described in the AX program area.

APR-AX-03. A formal training program needs to be established to furnish clear, concise, and authoritative direction for each of the program elements identified in Finding SF-AX-03 (AX.01, AX.03, AX.05, and AX.06).

4.4.7 Emergency Preparedness

4.4.7.1 Overview

An emergency preparedness (EP) program should ensure that effective plans and procedures exist for implementation and control of emergency response throughout the site. These plans and implementing procedures must ensure that adequate training, drills, and exercises are conducted to maintain an effective program and also that needed facilities, equipment, and procedures are provided. In addition, these plans and implementing procedures should ensure that effective interfaces are established with the offsite agencies and organizations (federal, state, and local) that would support any response to an onsite emergency situation. Emergency assessment and notification procedures must be employed, and personnel exposure to hazards during emergency response activities must be minimized.

The emergency preparedness program at SNL, Albuquerque, is administered by the Emergency Management and Operations Training Division (3438) in the Safeguards and Security Services Department (3430). The current division staff includes three fully trained emergency preparedness professionals, one of whom is specifically designated as Emergency Preparedness Manager, and two support personnel. The SNL, Albuquerque, Emergency Operations Center (EOC) is located in the basement of Building 801S in Tech Area I.

The EP program in place at SNL, Albuquerque, was established prior to the issuance in July 1989 of DOE Order 5500.3A; numerous audits had shown the program to be in compliance. This program emphasizes the response aspects of emergency preparedness. DOE Order 5500.3A invokes an essential change in emergency preparedness philosophy and implementation (emphasizing prevention), the effects of which are felt in virtually all elements of our program. The result is that SNL, Albuquerque, is largely noncompliant with current DOE orders. A number of areas of noncompliance were identified in the independent review conducted by DOE/AL, Government Assistance and Operations Division, during February 1990.

A rudimentary emergency preparedness plan currently exists for SNL, TTR; at this site, response functions are shared between SNL, the Air Force, and Reynolds Engineering and Electric Company (REECO). This plan, as implemented, does not comply with DOE orders. At present, there is no EP plan for SNL, KTF, although as tenants on the Navy's Pacific Missile Range Facility we comply with their emergency response directives.

After some delay, attributable in part to management indecision and lack of resource allocation, a project was initiated in April 1990 to achieve compliance with DOE orders regarding emergency preparedness. This project, referred to as the Emergency Preparedness Upgrade Project, is comprehensive in purpose and scope and is expected to bring SNL, Albuquerque (including TTR and KTF), into full compliance by December 1991. The essential elements of this project include the Emergency Preparedness Plan, Emergency Plan Implementing Procedures, training, drills, and exercises; details are documented in "Sandia National Laboratories 1990-1991 Emergency Preparedness Upgrade Project Plan."

The findings noted below were generated as a result of analysis of 83 FIS responses addressing the EP program area performance objectives, interviews with Department 3430, Directorate 7800, and selected technical line organization personnel; and a tour/inspection of the EOC and the emergency response mobile command post vehicle and equipment. DOE Order 5500.3A was also reviewed to gain a better understanding of the TSA performance objectives.

4.4.7.2 Significant Findings

Finding SF-EP-01 [Reference APR-EP-01]

The existing SNL Emergency Preparedness Master Plan does not adequately provide for documentation (all areas), tracking and closing lessons learned, definition of specific hazards and associated responses, agreements with offsite agencies, or emergency notification throughout the site. (EP.01, EP.02, EP.04, EP.05, EP.06, EP.07)

Finding SF-EP-02 [Reference APR-EP-01]

Many of the technical line organizations are unaware of even the basic nature of the SNL, Albuquerque, Emergency Preparedness Master Plan. This ignorance too often results in nonexistent, or at best inadequate, emergency response training beyond "generic" fire drills. Where response plans do exist, they are typically localized and uncoordinated. (EP.03)

Finding SF-EP-03 [Reference APR-EP-01]

Management support for EP activities has been deficient. Initiation of the Emergency Preparedness Upgrade Project was delayed almost a year due in part to management reluctance to commit needed resources. In the technical line organizations, vacancies on fire teams remain unfilled for months at a time, planned emergency response drills are not conducted, no lessons-learned feedback is provided, training needs are not identified or addressed, etc. Crisis management training is too often cancelled by the executive staff because of higher priority activities. (EP.01)

Finding SF-EP-04 [Reference APR-EP-01, APR-FP-01]

EP roles and responsibilities related to fire protection programs and activities need to be more clearly established. Interfaces with outside agencies are of particular concern (see Finding SF-FP-01 for additional information.). (EP.01, EP.02, EP.04, EP.06)

Discussion

Factors contributing to noncompliance in EP by SNL differ somewhat between the technical line and support organizations. The line organizations frequently cite a lack of communication, education, and training as contributing to their ignorance of emergency response issues and lack of compliance (a lack of line organization buy-in, or ownership, for achieving a successful EP program throughout the corporation is evident). The support organization, on the other hand, notes that lack of adequate resources, competing priorities, and constant regulatory change hamper their progress toward achieving compliance.

Overall, the present state of EP compliance at SNL is lower than that found by the Tiger Team last spring at SNL, Livermore, principally because the Emergency Preparedness Plan and Emergency Preparedness Implementing Procedures at SNL which address the latest DOE 5500-series orders (particularly DOE Order 5500.3A), are still under development. As was found in the Tiger Team assessment of SNL, Livermore, a significant effort is needed at SNL to establish interface agreements with offsite agencies (Concern EP.4-1). This requires close coordination with DOE/AL for formalization and implementation of these agreements. As identified in the SNL, Livermore, Tiger Team findings, Emergency Action Level criteria need to be carefully established, paying particular attention to nonradiological incidents and releases (Concern EP.6-1). Emergency notification procedures throughout the site are being reevaluated in light of the SNL, Livermore, Tiger Team finding in this area (Concern EP.5-1).

4.4.7.3 Action Plan Requirements

APR-EP-01. SNL must develop an emergency preparedness program to comply with DOE Orders 5500.1A, .2A, .3A, .4, .7A, and .9. Both line and support organization roles, responsibilities, and interfaces for developing, implementing, and conducting this program must be clearly established.

4.4.8 Technical Support

4.4.8.1 Overview

The eight program elements in the technical support (TS) program area include Organization and Administration (TS.01), Procedures and Documents (TS.02), Facility Modifications (TS.03), Equipment Performance Testing and Monitoring (TS.04), Environmental Impact (TS.05), Packaging and Transportation of Hazardous Material (TS.06), Reactor Engineering (TS.07), and Criticality Safety (TS.08).

DOE Orders 5480.5 and 5480.6, which cover safety for nuclear facilities and nuclear reactors, respectively, constitute the majority of the performance criteria. DOE Orders 5000.3 and 5484.1 are used for reporting requirements. Attachment 2 of DOE Order 5480.4 lists the applicable general ES&H-related mandatory standards. Several other orders, such as DOE Order 5480.3, apply to the packaging and transportation of hazardous materials.

At SNL, the reactor operations and nuclear criticality issues only exist in Area V in the Reactor Development and Applications Department (6450). The facilities of particular interest in this organization are the Sandia Pulsed

Reactor (SPR), the Annular Core Research Reactor (ACRR), and the Hot Cell. Some operations that are considered nuclear exist in a few other places in the Laboratories at large. Building and utility support is furnished by the Facilities Directorate (7800). Packaging and transportation of hazardous materials is regulated by the Hazardous Materials/ES&H Coordination Division (3429). Transportation of radioactive materials is provided by the Storage and Equipment Services Division (3425).

Fifty-five FISs associated with this program area were returned and analyzed. A follow-up meeting was held with the principal participants in the operation and support of the reactor complex. This meeting was held jointly with the AX SAWG representative. Discussions were also held with the range manager at TTR about the applicability of a graded approach of TS on his operations. Follow-up discussions regarding conformance with the TS performance criteria were conducted with personnel representing the Solar Test Facility and the Neutron Generator Test Facility. The hazardous material transportation program writers were also interviewed about their current activity and status.

4.4.8.2 Significant Findings

Finding SF-TS-01 [Reference APR-TS-01]

The TSA program area for TS program area should not be applied or graded for nonnuclear activities of the Laboratories except for facilities that require a Safety Assessment (SA) or Safety Analysis Report (SAR). (TS.01 through TS.08)

Discussion

Performance objectives TS.03, TS.05, TS.07, and TS.08 are written for nuclear operations. Performance objective TS.02 seems to apply to facilities that require an SAR. The remaining performance objectives, TS.01, TS.04, and TS.06, cover organization and administration, equipment performance testing and monitoring, and packaging and transportation of hazardous materials. These three performance objectives are covered in other program areas.

At SNL, Livermore, there are no operations where nuclear reactor and nuclear criticality criteria apply. The Tritium Research Laboratory (TRL) facility is subject to the requirements of DOE Order 5480.5. The Tiger Team identified six concerns in the TS program area. Three were applicable to program element TS.01 (Organization and Administration), two to program element TS.02 (Procedures and Documents), and one to program element TS.04 (Equipment Performance Testing and Monitoring). Five of these six concerns address the lack of procedures, building space, document control, formal control, and review of facility features in the Facilities Directorate. These issues at SNL, Albuquerque, are covered in other program areas. The one concern in program element TS.04 had to do with explosive gas detectors.

4.4.8.3 Action Plan Requirements

APR-TS-01. An action plan is needed to establish and document the requirements and procedures to accomplish the following:

* Full compliance in the TS program area for the reactor operations in the Reactor Development and Applications Department (6450). Compliance is also required in all nuclear operations. The SNL nuclear operations must be determined and so notified.

* A graded approach to compliance in the other facilities with the TS program element if and when they are determined to require an SA or SAR because of ES&H-related hazards.

* Uniform and consistent determination of SA and SAR facilities as a function of ES&H-related risk. This is a final outcome, provided by the risk management element of SNL, of the preliminary hazard analysis (PHA) process that will determine the facilities to receive the enhanced support required by a graded application of the TS performance criteria.

4.4.9 Packaging and Transportation

4.4.9.1 Overview

This self-assessment evaluated the packaging and transportation (PT) program area against ten performance objectives, including Administration and Organization (PT.01), Training (PT.02), Quality Assurance (PT.03), Regulatory Compliance (PT.04), Accidents and Incidents (PT.05), Operations (PT.06), Intra-Building Movements (PT.07), Onsite Transfers (PT.08), Offsite Shipments (PT.09), and Records (PT.10).

Of the ten packaging and transportation performance objectives, nine were evaluated through 54 FIS responses as well as onsite observations and interviews with packaging and transportation staff and management. The Intra-Building Transfers program element (PT.07), which deals with moving hazardous materials within in a building, was not evaluated in this program area. It falls more directly in the scope of the occupational safety and the industrial hygiene programs, and is covered in the Hazards Communication (HazCom) program and the ES&H Manual (SAND88-1161). The completed FISs for program element PT.07 were given to the worker safety and health (OSHA) compliance (WS) self-assessment team. For the purpose of this self-assessment, unless otherwise stated, the term "hazardous materials" is assumed to include hazardous materials, substances, and wastes.

The industrial handling and movement of hazardous materials is a closely controlled and government-regulated process. SNL and DOE have administered programs reflective of industry standards and compliant with federal regulations. Applicable federal requirements include the DOT Hazardous Materials Regulations set forth in Title 49, Code of Federal Regulations, Parts 100 to 199, and DOE Orders 1540.1 (Materials Transportation and Traffic Management), 1540.2 (Hazardous Materials Packaging for Transport-Administrative Procedures), 5480.3 (Safety Requirements for the Packaging and Transportation of Hazardous Materials, Hazardous Substances, and Hazardous Wastes), and 5610.1 (Packaging and Transportation of Nuclear Explosives, Nuclear Components, and Special Assemblies).

At SNL, packaging and transportation operations are outlined in SLI 6950, "Shipments and Handcarry of Property and Material," which governs shipments moving offsite; SLI 2110, "Government Vehicles and Equipment," which includes transportation services; and by the "Onsite Transportation of Hazardous Materials and Wastes" manual. These documents are applicable to all sites, except KTF, which has its own procedures in place to coordinate hazardous material and waste movements on the Navy's Pacific Missile Range. Specific operating procedures are in place, such as the Traffic Operating Procedures (TOP) at Albuquerque and the Traffic and Shipping Procedures at both KTF and TTR.

Support organizations performing packaging and transportation functions at Albuquerque include the Traffic Management Section (3743-1), which interfaces with offsite carriers for hazardous materials transportation and prepares all shipping documents; the Just-In-Time (JIT) Receiving Section (3743-2), which receives and distributes onsite JIT material, including compressed gas cylinders and chemicals; the Receiving and Processing Section (3428-2) dockworkers who distribute JIT materials intra-building; the Hazardous Materials/ES&H Coordination Division (3429), which determines the packaging and shipping specifications required for each hazardous material shipment; the Shipping and Receiving Division (3428), which packages, ships, and receives hazardous materials other than JIT material and explosives; the Storage and Equipment Services Division (3425), which packages, stores, and controls explosive and nuclear materials; the Transportation Division (3423), which operates the motor pool and provides onsite and some offsite transportation; the Coyote Canyon Test Complex Department (7530), which uses and transports explosives onsite in support of testing operations; the Facilities Operations Division III - Remote Areas (7818), which operates the Area III motor pool and moves both hazardous and nonhazardous materials within the remote areas; and the Environmental Programs Department (3220), which receives, packages, and transports hazardous waste onsite, and arranges for the transportation of hazardous waste to disposal sites. In addition to these

support organizations, line testing operations can involve the movement of hazardous materials and wastes to support organizations, as well as the movement of hazardous materials onsite, and some plant maintenance functions can involve the onsite transportation of hazardous materials and wastes.

At TTR and KTF, SNL directs the packaging and transportation operations performed by the support contractors, REECO and Raytheon, respectively. The Albuquerque-based counterpart organizations have developed initial procedures for each site and provide ongoing consultation and support.

A corporate packaging and transportation program is being established to specifically assign responsibilities for this program area and to formalize the operations in terms of accountability, auditability, and effectiveness of regulatory compliance. The upgraded program will require improved operating procedures with specific instructions for each functional area engaged in the packaging and transportation of hazardous materials and wastes.

4.4.9.2 Significant Findings

Finding SF-PT-01 [Reference APR-PT-01]

There is no formal program throughout the Laboratories that establishes the requirements and responsibilities for the packaging and transportation of hazardous materials and wastes. The packaging and transportation functions are fragmented by function-specific and commodity-specific operations, and are without a central control point. (PT.01, PT.04, PT.06, PT.09)

Discussion

Although the offsite packaging and transportation of hazardous materials has been conducted in a compliant manner in the past, the policies and responsibilities to accomplish this function have not been formally established. A packaging and transportation program throughout the Laboratories that addresses specific responsibilities, authorities, and organizational interfaces does not exist.

There are several organizations that have responsibility for one or more elements of hazardous materials transportation compliance at SNL. These responsibilities and relationships have developed over time based on functional areas or programmatic needs. Therefore, there is no coordinated method of disseminating regulatory changes and ensuring their effective and timely implementation. In addition, there are no formal means to evaluate changes in external requirements or to ensure the internal procedures are modified to reflect those changes.

Based upon the commodity being shipped, outbound offsite shipments of hazardous materials are made from one of three locations at SNL, Albuquerque. The Hazardous Waste and Wastewater Division (3221) has full jurisdiction over all waste shipments, independent of the rest of the packaging and transportation organizations. All nonwaste offsite shipments are overseen by the Hazardous Materials/ES&H Coordination Division (3429). Explosive and some radioactive materials are packaged and prepared for shipment directly from the 6000 Igloo area. All other shipments are packaged and prepared by the Shipping and Receiving Division (3428) at Building 957 and shipped from that location. Overall, packaging, preparation, and certification guidance regarding nonwaste shipments is provided by Division 3429 with the actual certification of compliance with federal requirements being performed by the Traffic Management Section (3743-1) along with freight paper preparation and carrier interface.

Each SNL site has its own organizations that ensure packaging and transportation regulatory compliance for that site. The Hazardous Materials/ES&H Coordination Division (3429) is generally thought to be the SNL focal point for addressing and resolving hazardous materials packaging and transportation-related regulatory and DOE order compliance issues. This division maintains current copies of applicable regulations and DOE orders, tracks changes in regulations and DOE orders on a regular basis, and informally notifies the various sites and other interested organizations of these changes. When requested, this division will provide guidance, interpretation, and assistance in the implementation of the regulations and orders. However, there is no formal program that establishes Division 3429 as the SNL focal point for addressing, tracking, and resolving hazardous materials packaging and transportation regulatory compliance issues. This division does not have the formal responsibility or authority to issue guidance and interpretations to other SNL organizations and sites.

The above-identified deficiencies were also identified by the Tiger Team in its appraisal of the packaging and transportation program at SNL, Livermore (Concern PT.1-1).

Finding SF-PT-02 [Reference APR-PT-01]

Packaging and transportation personnel are not consistently trained and certified to meet the requirements of DOE Order 5480.3 and 49 CFR. (PT.02)

Discussion

DOE Order 5480.3 and 49 CFR require training for all individuals who perform functions associated with the packaging and transportation of hazardous materials. Individuals who require training include, but are not limited to, those who certify shipments, and packers, handlers, drivers, and their supervisors.

Initial and recurrent training is required at a level and with a content appropriate to the job function. Most SNL organizations that perform packaging and transportation functions have some type of informal training program. However, initial, recurrent, and on-the-job training requirements are neither consistently specified nor applied across organizations or across common job classifications.

A formal comprehensive job task analysis has not been performed to determine training needs for packaging and transportation personnel. Training has been provided by internal and external sources. Internal training is either provided on the job or in a classroom format by co-workers, supervisors, or internally recognized experts. However, there are no prescribed requirements for certified instructors, approved curricula, performance measurement exercises, performance criteria, documentation and records retention, or frequency of continuing training.

The above-identified deficiencies were also identified by the Tiger Team in its appraisal of the packaging and transportation program at SNL, Livermore (Concern PT.2-1).

Finding SF-PT-03 [Reference APR-PT-01]

There is a lack of formality, documentation, and consistency in most packaging and transportation functions because of a need for additional written operating procedures. (PT.06, PT.09)

Discussion

There have been many practices implemented at SNL to provide compliance with DOE orders and regulatory requirements in the packaging and transportation of hazardous materials. These practices have been developed over time and institutionalized through routine operations. These practices are updated or revised as necessary to maintain compliance. Employees involved in packaging and transportation activities are familiar with these practices. New and revised practices are often implemented informally through on-the-job communications.

There is a need to formally document these practices in all packaging and transportation functions. In particular, the Hazardous Materials/ES&H Coordination Division's oversight activities need to be documented with approved procedures. This division oversees several areas associated with hazardous materials packaging and transportation, including packaging, marking, labeling, placarding, specification container fabrication, inspection, and administrative duties. This division does not have sufficient documented procedures to assure that these activities are performed consistently in compliance with applicable regulations and DOE orders.

Because of the decentralized nature of packaging and transportation activities at SNL, there are many other organizations that need to develop or review their written procedures. These procedures will then serve to consistently implement the regulatory requirements applicable to their operations.

Similar deficiencies were identified by the Tiger Team in its appraisal of the packaging and transportation program at SNL, Livermore (Concern PT.9-1).

Finding SF-PT-04 [Reference APR-PT-01]

The onsite transportation of hazardous materials is not performed in a consistent manner in accordance with established standards. (PT.08)

Discussion

SNL has developed an "Onsite Transportation of Hazardous Materials and Wastes" manual. This manual establishes standards for the onsite movement of hazardous materials at all SNL sites except KTF. However, this manual is not a controlled document and is not widely distributed or consistently followed by the line organizations.

At the time that this manual was developed, DOE had not established requirements for onsite movements of hazardous materials. DOE has since distributed a draft DOE order that provides some guidelines, but this order has been in draft form for several years. Therefore, SNL took the initiative to develop its own minimum standards in the manual.

The manual describes packaging, identification, movement, movement documentation, and placarding methods for radioactive, explosive, and other hazardous materials. The manual also establishes training requirements for the individuals performing these functions. However, there is no oversight responsibility assigned to assure compliance with the requirements of the manual nor is there a formal process for internal assessments of packaging and transportation functions.

Since the manual is not widely distributed and has not been formally implemented, what the manual describes as requirements are commonly viewed as suggested guidelines to be followed. These guidelines have not been widely adopted. Many organizations do not know that this manual is available.

The above-identified deficiencies were also identified by the Tiger Team in its appraisal of the packaging and transportation program at SNL, Livermore (Concern PT.8-1).

Finding SF-PT-05 [Reference APR-PT-01]

There is no comprehensive oversight of packaging and transportation functions by the ES&H and Quality directorates. (PT.03)

Discussion

Some of the packaging and transportation organizations at SNL have quality plans that address their functions. However, a comprehensive QA program for packaging and transportation does not exist. The quality plans do not consistently address the elements of applicable DOE orders and ANSI/ASME NQA-1-1986.

There is no formal program for regular periodic assessments of packaging and transportation functions by internal, external, and/or independent parties. Neither the ES&H Directorate (3200) nor the Quality Improvement Directorate (7300) have been involved in program development or oversight (either from a safety or quality standpoint) for packaging and transportation.

The operations in the Operational Services Department (3420) have documented quality plans and are subject to an internal audit schedule with the Directorate 3400 Quality Coordinator. However, these audits have been postponed recently due to a change in direction and approach in quality improvement at SNL. The existing quality plans do not address the elements of ANSI/ASME NQA-1-1986 and need to be revised to address changes in requirements and the SNL organization.

The Traffic Management Appraisal and the Hazardous Material Packaging and Transportation Appraisal, which are performed by DOE, have occurred at infrequent intervals and have not detected fundamental program deficiencies.

Similar deficiencies were identified by the Tiger Team in its appraisal of the packaging and transportation program at SNL, Livermore (Concern PT.3-1).

4.4.9.3 Action Plan Requirements

APR-PT-01. SNL should develop a corporate program for packaging and transportation of hazardous. This new program should formally define and document the DOE compliance requirements, responsibilities, authorities, accountabilities, and interfaces within the organizations involved in packaging and transportation of hazardous materials. The new program should also specify the training, certification, and documentation requirements associated with the performance of functions related to packaging and transportation of hazardous materials.

Specifically, the program should:

* Apply to all four SNL sites (Albuquerque, Livermore, TTR, and KTF)

* Determine the requirements, policy, and need for formal implementing procedures to achieve compliance with DOE Orders 1540.1, 1540.2, 5480.3, and 5610.1 and applicable federal, state, and local regulations

* Establish oversight responsibilities for each site

* Require development of site-specific management and implementation plans for all four sites

* Require that an SNL Transportation Committee be established to consolidate the current decentralized approach to packaging and transportation of hazardous materials and waste

* Provide requirements for identification and communication regarding hazardous materials during movements, transfers, and shipments

* Establish requirements for offsite shipments of hazardous materials

* Establish requirements for onsite transfers and movements of hazardous materials

* Establish a storage and cargo compatibility program for all SNL transportation operations

* Establish a vehicle standards and operations program for all SNL transportation operations

* Link with SNL procedures for responding to findings as a result of internal and external audits

* Require oversight of packaging and transportation functions by the ES&H and Quality directorates

* Link with SNL's program for self-assessment to ensure continuing compliance

* Provide guidance and support to SNL organizations in conducting their operations in accordance with the program elements

4.4.10 Nuclear Criticality Safety

4.4.10.1 Overview

Pursuant to Article B-III of the contract for the operation of SNL, Sandia Corporation has agreed to comply with all applicable ES&H regulations and requirements of the DOE. Thus, SNL is required to comply with the requirements of DOE Order 5480.5, Safety of Nuclear Facilities, for nuclear criticality safety.

This assessment addresses the five nuclear criticality safety performance objectives, CS.01 through CS.05, as specified in the DOE document, "Performance Objectives and Criteria for Technical Safety Appraisals at Department of Energy Facilities and Sites," DOE/EH-0135, April 1990.

The Health and Safety Department (3210) has responsibility for the development, approval, distribution, and control of nuclear criticality safety requirements applicable to SNL (including Albuquerque, TTR, and KTF), facilities and project activities. SNL managers in turn are responsible for establishing programs within their areas to prevent the occurrence of accidental nuclear criticality, follow requirements and guidelines for safe operations involving fissile materials, and ensure that only employees trained in nuclear criticality safety are assigned to work with fissile materials where a nuclear criticality could occur.

The current program is implemented by SLI 2047, "Nuclear Criticality Safety," issued on April 30, 1985, and Section C, "Nuclear Criticality Safety," in Chapter 8, "Radiation Safety," of the "Environment, Safety, and Health Manual," issued in September 1988. Oversight is required by SLI 1030, "Official Sandia Laboratories Committees," dated May 10, 1985, which contains the charter and outline of the duties of the Sandia Nuclear Criticality Safety Committee (SNCSC) and its subcommittees.

The Sandia Radiological and Criticality Safety Committee (SRCSC) was chartered in August 1989 by the vice president of Organization 3000 to provide safety oversight for nuclear facilities and nuclear materials with criticality potential. The SRCSC and its subcommittee, the Area V Radiological and Criticality Safety Committee (RCSC), supplanted the above SRCSC and are intended to provide SNL management an internal safety review system to ensure that nuclear facilities are operated safely and nuclear materials with criticality potential are used in a safe manner and in compliance with DOE requirements.

Generally, the essential elements of the needed nuclear criticality safety program are in place at SNL. The documentation, however, is out of date and does not reflect the current organization and committee titles. While the seasoned supervisor working with fissile materials probably knows what needs to be done, a new supervisor might have difficulty in determining the current requirements from the existing documentation.

The findings noted below were generated as a result of analysis of 34 FIS responses addressing criticality safety performance objectives. DOE Order 5480.5 also was reviewed to gain a better understanding of overall requirements.

The nuclear criticality safety program area was not specifically assessed by the Tiger Team at SNL, Livermore.

4.4.10.2 Significant Findings

Finding SF-CS-01 [Reference APR-CS-01]

The SNL nuclear safety program does not meet all the requirements of DOE Order 5480.5. (CS.01, CS.03, CS.04, CS.05)

Discussion

While the technical requirements of DOE Order 5480.5 are known to personnel working with fissile materials, the documentation of these requirements and assignment of organizational responsibilities is inadequate.

Finding SF-CS-02 [Reference APR-CS-01]

A documented system does not exist for the control and traceability of required nuclear criticality safety program records. (CS.01)

Discussion

While statements are required to be obtained regarding criticality safety of test units, there is no requirement that records of these reviews be kept. Also, records of analyses for criticality accident alarms are required to be generated, but there is no requirement to keep these records in a particular place for review and audit.

Finding SF-CS-03 [Reference APR-CS-01]

The parameters that are controlled to assure subcriticality are not always explicitly identified, nor are the associated limits given. (CS.03)

Discussion

In some cases, organizations admit that these parameters are not explicitly identified. This may be because of the lack of a program requirement to do so.

Finding SF-CS-04 [Reference APR-CS-01]

Nuclear criticality safety evaluations are not always documented with sufficient detail to allow independent review of the results. (CS.03)

Discussion

In some cases, organizations admit that these evaluations are not adequately documented. This may be because of the lack of a program requirement to do so.

Finding SF-CS-05 [Reference APR-CS-01]

Operations to which nuclear criticality is pertinent are not always governed by written procedures that include limits and controls. (CS.04)

Discussion

In one case, an organization admits that these operations do not have written procedures. This may be because of the lack of a program requirement to do so.

Finding SF-CS-06 [Reference APR-CS-01]

In some organizations there are no procedures requiring the investigation of occurrences involving violations of criticality safety limits. (CS.04)

Discussion

The concerned organizations need to develop appropriate procedures in accordance with the requirements of DOE Order 5000.3A and existing SNL incident reporting procedures.

Finding SF-CS-07 [Reference APR-CS-01]

While all organizations are testing criticality alarm systems according to a defined schedule and are testing audible signal generators at least once every three months, there is no programmatic requirement to do so. (CS.05)

Discussion

None.

4.4.10.3 Action Plan Requirements

APR-CS-01. A program needs to be developed by the Health and Safety Department (3210) (ES&H Program No. 11c, Nuclear Criticality Safety) to address the requirements of DOE Order 5480.5. This program should address the general requirements of this order and include the following specific requirements identified by the self-assessment process:

* statement of recordkeeping requirements
* identification of parameters being controlled to assure subcriticality and the associated limits
* documentation of safety evaluations in sufficient detail to allow for independent review of results
* preparation of procedures for all operations where nuclear criticality is a concern
* development of incident reporting and investigating procedures by reference to the program in development (ES&H Program No. 8, "ES&H Information Reporting") and its associated requirements for investigation
* testing of criticality alarm systems and audible signal generators

4.4.11 Security/Safety Interface

4.4.11.1 Overview

This self-assessment evaluated the security/safety (SS) interface program area against four performance objectives: Safety of Improvements (SS.01), Emergency Access and Egress (SS.02), Facility Planning for Security/Safeguards Emergencies (SS.03), and Safety of Security Activities (SS.04).

All four security/safety interface program elements were evaluated through 25 FIS responses as well as through interviews and meetings with key personnel.

The Facilities Directorate (7800) has formal procedures for security and ES&H reviews of new construction and facility modification plans. These procedures comply with DOE Order 6430.7A and consider necessary design criteria such as the control of classified documents and materials, material control and accountability (MC&A), operations security, and personnel access and egress. Each project is assigned an inspector who is responsible to follow through the total process (design through final completion of construction or modification). If security or safety design criteria cannot be followed, the inspector negotiates

with the concerned organizations to resolve the issue. Inspectors are members of the Construction Services Division (7852).

Security reviews are performed by the Security Plans, Coordination, and Awareness Division (3432). If applicable, the review is coordinated with the Electronic Security Systems Division (3433) and/or the Access Control and Administrative Support Division (3437). ES&H concerns are initially reviewed by the Facilities Safety and Environmental Engineering Division (7853). If necessary, support is requested from the ES&H Directorate (3200), which reviews the project and makes appropriate design and construction recommendations.

All signed-off review forms, when returned to Directorate 7800, are filed in the project folder, and remain as a permanent part of the project file.

4.4.11.2 Significant Findings

Finding SF-SS-01 [Reference APR-SS-01]

The interfaces between the security, safety engineering, and facilities organizations regarding the review of facility modifications, including security/safeguards improvements and modifications, can be circumvented. (SS.01)

Finding SF-SS-02 [Reference APR-SS-01]

Improvement is needed in the documentation of the original design basis and change control processes. (SS.01)

Discussion

Although procedures describing the design review process associated with new construction and facility modifications exist, it appears that required reviews by security and safety engineering organizations can be circumvented. This situation is particularly true where changes are made in the field during the construction phase. More formality is required in the design review and change control processes to ensure that the appropriate reviews are performed and documented. Toward this end, the Project Management and Quality Assurance Manual will include improved procedures for design review and change control, and for the documentation of those processes.

Similar deficiencies were identified by the Tiger Team in its appraisal of the security/safety interface program area at SNL, Livermore (see findings for SS.01 and Concern TS.2-2).

Finding SF-SS-03 [Reference APR-SS-01]

The line organizations are generally unaware of the requirement that facility modification plans, including those for security/safeguards improvements and modifications, must be reviewed by the security and safety engineering organizations. (SS.01, SS.02)

Discussion

Line organizations are generally unaware that facility modifications must be reviewed by the security and safety engineering organizations before their implementation. In addition, it was found that local modifications were sometimes performed by the line organizations without consultation with, or the knowledge of, the security, safety engineering, or plant engineering organizations. For example, when the 5,000-foot sled track was extended to 10,000 feet, the evacuation route from Area III was altered in the process without input from the security or emergency preparedness organizations.

This finding was not specifically identified by the Tiger Team in its appraisal of the security/safety interface program area at SNL, Livermore.

4.4.11.3 Action Plan Requirements

APR-SS-01. The procedures contained in the Project Management and Quality Assurance Manual, that govern design review and change control need to be revised to ensure (1) that those processes are documented, and (2) that proposed facility modification plans, including those for security/safeguards improvements and modifications, are reviewed by Security and Safety Engineering. Upon completion of those procedures describing the upgraded design review and change control processes, it will be necessary to communicate the requirements contained therein to all affected parties to ensure that all appropriate reviews are performed and documented.

4.4.12 Experimental Activities

4.4.12.1 Overview

The performance objectives for the experimental activities (EA) program area address (1) documented responsibilities for the operators and experimenters, (2) independent safety review committees to approve experiments, (3)

documented design, operation details, and hazard identification, and (4) assurance that experiments do not extend previously identified risks for the site or facility. All four EA performance objectives were evaluated for a variety of experimental activities and associated ES&H-related risks at SNL.

The SNL ES&H Manual (SAND88-1161) does not provide specific guidance for the conduct of experiments. Appendix C, "A Guideline for the Preparation of Safe Operating Procedures (SOPs)," does provide the requirements for activities or experiments that have serious safety issues or potential environmental impact. The use of SOPs has been the historical way of conducting all hazardous work, including experiments, at SNL. A formal (but not independent) review, approval, and change process for SOPs is clearly defined. Appendix A, "Charter for SHEAC Council," defines the organizations and responsibilities of committees that are set up in each vice presidency to review their operations and assure compliance with ES&H requirements. The SHEAC committees have been functional since 1988, but they do not review facilities, laboratories, or new experiments on a comprehensive basis. They develop findings, but do not approve or disapprove activities. Past SHEAC reports and corrective actions are on file in each vice presidency.

The findings were derived from 37 FIS responses and from four onsite observations of high-risk operations. In addition, the SNL, Livermore, self-assessment report and the DOE Tiger Team report for SNL, Livermore, were reviewed for consistency with these results. The onsite observations addressed activities in the Advanced Laser and Optoelectronics Division (1164), Advanced Fusing Development Division (5166), Fusion Technology Division (6428), and Radiation Physics and Hot Cell Applications Division (6454). During the onsite observations, special attention was paid to how experiments are reviewed for ES&H issues and how their conduct is managed at the facility or in the laboratory.

4.4.12.2 Significant Findings

Finding SF-EA-01 [Reference APR-EA-01]

Many experimental programs are conducted without understanding DOE requirements, using locally developed and often informal policies and programs to suit the organization or operation. (EA.01, EA.03, EA.04)

Discussion

Because of the large variety and associated risks of experiments conducted at SNL, we found that many organizations have established their own policies and practices for conducting experiments. The formality used is, in general, related to the nature and scale of the hazard. Bench-scale experiments usually have

little formality other than the use of SOPs that cover the general operation. More formality is used for experiments that involve radioactivity, large energy sources, or large-scale systems.

The Tiger Team at SNL, Livermore, noted in Concern OP.2-1 that formality in the conduct of operations has not been applied to experiments.

Finding SF-EA-02 [Reference APR-EA-02]

Independent safety review committees are not used to review many experimental programs at SNL. (EA.02)

Discussion

SNL uses formal, independent safety review committees only for our highest risk programs, for example, reactor experimental programs. Other experimental programs are conducted with a wide spectrum safety review processes that are often informal.

The SNL, Livermore, Tiger Team Concerns FR.1-1 and FR.2-1 noted that independent safety reviews are not conducted in compliance with DOE Orders 5480.5 and 5482.1B.

4.4.12.3 Action Plan Requirements

APR-EA-01. A program is needed throughout the corporation that assures that experimental activities (nonroutine operations) are conducted with formality and without adding new risks or hazards to our site and facilities. The program we develop to implement DOE Order 5480.19, Conduct of Operations, needs to incorporate the nonroutine nature of experimental activities. As with the conduct of routine operations, experimental activities must be implemented using a graded approach to the risk and hazards that the experiments introduce. Special attention regarding experimental (nonroutine) operations must be addressed in our implementation of Chapters IV (Communications), VII (Control of Equipment and Systems Status), XI (Logkeeping), XIV (Required Reading), XV (Timely Orders to Operators), and XVI (Operations Procedures) of DOE Order 5480.19 (see also APR-OP-01, 02, 03, 04, 08, and 09.).

APR-EA-02. SNL must establish a program that assures that experiments with "significant" ES&H-related risks and hazards receive formal review and approval by independent review teams. Guidance for the definition of "significant" risk or hazard and for the nature and composition of the review team must be provided. The requirements for independent review teams for experimental activities should be included in our program that implements DOE Orders 5480.5 and 5482.1B, Site/Facility Safety Review.

4.4.13 Site/Facility Safety Review

4.4.13.1 Overview

The self-assessment of the site/facility safety review (FR) program area was conducted in accordance with the six performance objectives contained in the TSA manual and derived from DOE Orders 5480.5, 5480.6, and 5482.1B. The requirements contained in these orders establish the need for a formal safety review structure throughout the Laboratories to (1) provide a basis for safe laboratory operations, (2) provide that annual safety reviews are conducted, (3) ensure that a management appraisal of the safety review system is conducted, and (4) ensure that a program is in place to benefit from lessons learned inside and outside the facility.

At present, no single safety review committee exists at SNL that complies with the above requirements. In some specific areas, such as the SPR, the ACRR, and the Area V Radiological and Criticality Facilities (Hot Cell, etc.), separate formal committees exist, chartered under the Sandia Reactor Safety Committee. A similar committee structure exists in the Pulsed Power Safety Committee and the subordinate Accelerator Safety Committees (PBFA).

Primary SNL safety guidance is presently contained in the ES&H Manual (SAND88-1161), which relies heavily on SOPs reviewed and approved by the line and safety organizations. These SOPs do not require the approval of a formal oversight safety committee, although they are sometimes reviewed after the fact by a vice presidential SHEAC. The SHEACs are not structured to be an element of the safety review and approval process.

The findings for this assessment were derived from 60 FIS responses returned from selected line organizations. These responses were augmented by subsequent interviews with representative line organizations and by examination of some existing committee charters.

4.4.13.2 Significant Findings

Finding SF-FR-01 [Reference APR-FR-01]

SNL does not have safety review committees throughout the site that comply with all requirements of DOE Orders 5480.5, 5480.6, and 5482.1B. The existing SHEACs do not review the operations of each facility with sufficient depth or frequency to ensure safe performance, nor do they routinely exercise before-the-fact approval authority. (FR.01, FR.02, FR.03)

Finding SF-FR-02 [Reference APR-FR-02]

An annual safety review of all facility operations is not conducted as required by DOE Order 5482.1B. The SOPs that are currently employed do not provide for sufficient review by noninvolved operations personnel. (FR.04)

Finding SF-FR-03 [Reference APR-FR-02]

Adequate appraisals of the SNL safety review system are not conducted by SNL upper management. (FR.05)

Finding SF-FR-04 [Reference APR-FR-03]

There is no lessons-learned program to assure that valuable onsite and offsite operating experiences are disseminated to operating personnel. (FR.06)

Discussion

The SNL safety review system does not satisfy the intent of applicable DOE orders. A formal safety program effort throughout the Laboratories is clearly lacking, as is demonstrated by the wide divergence in implementation of facility safety procedures. Furthermore, many members of management and staff erroneously believe that the ES&H Manual and the SHEACs provide sufficient guidance and, in themselves, constitute the mechanism for compliance. SNL's activities encompass a wide range of potentially hazardous conditions. In some activities, such as the SPR, ACRR, the Hot Cell, and PBFA, formal committee reviews are implemented and closely match some of the DOE requirements. However, not all of these facilities conduct triennial reviews or have a lessons-learned program. Other hazardous operations, such as those conducted at TTR, KTF, and the Coyote Test Complex, are lacking in adequate safety reviews and appraisals.

Less extreme activities, such as those conducted daily in laboratory experimentation, require less demanding safety reviews. However, SNL needs to develop a formal structure for conducting comprehensive safety reviews that are tailored to the risk levels associated with specific activities. One tool that should be helpful in developing a graded approach to safety analysis is the preliminary hazard analysis (PHA) program now under way.

Similar findings were identified by the Tiger Team during its assessment of the site/facility safety review program element at SNL, Livermore (Concerns FR.1-1, FR.2-1, FR.4-1, FR.5-1, and FR.6-1).

4.4.13.3 Action Plan Requirements

APR-FR-01. A safety committee structure should be developed to ensure that the requirements of DOE Orders 5480.5, 5480.6, and 5482.1B are implemented in a consistent manner across the Laboratories. All operations of the laboratories must be considered in the review process, including nonroutine (one-time) experimental activities. This committee structure should also provide guidance in the development of a graded approach, based on relative risks and hazards.

APR-FR-02. Directorate 3200 should develop a safety assessment program throughout the Laboratories to ensure that annual reviews and appraisals of all hazardous facilities are conducted. This program should also ensure that triennial management assessments of the safety program are conducted.

APR-FR-03. A method to analyze and publicize safety issues across SNL should be developed. This should include a lessons-learned program from in-house and external programs.

4.4.14 Radiological Protection

4.4.14.1 Overview

The radiological protection (RP) program area assessment addresses SNL compliance with the twelve performance objectives as specified in the TSA manual. The material presented in these objectives is based on DOE Orders 5480.10, 5480.11, 5480.15, and their supporting documents. The self-assessment reports reflect a "snapshot" of the work area at the time the self-assessment was performed and do not reflect the new programs or progress made since that time.

When the significant findings were compared with the key findings and concerns identified by the Tiger Team at SNL, Livermore, many similarities were noted in most objectives. One hundred and two self-assessment FISs were returned and analyzed for this program area. Matrices were developed to identify response similarities in both the performance criteria and the contributing factors areas. The results of these two matrices, with some interpretation by health physics professionals, were used to compile the significant findings as reported here.

The major areas identified as needing attention in this study and those that were also supported by observations of the Tiger Team at SNL, Livermore, are related to documentation, uniformity of operations, training, centralized

records, quality, ES&H metrics, and increased management awareness and support of ES&H issues.

4.4.14.2 Significant Findings

Finding SF-RP-01 [Reference APR-RP-01]

A clear line of responsibilities in radiological protection could not be identified. (RP.01)

Discussion

The ES&H Manual (SAND88-1161) in place at the period defined for this self-assessment addressed the line of responsibilities in radiological protection, but did not present the detail required by DOE Order 5480.11. The resultant lack of a full line of responsibilities and authorities was found at SNL, Albuquerque, and was also the subject of a key finding at SNL, Livermore. Policies, programs, and procedures currently under development include specific sections that define the flow of responsibilities as well as expansion of both their scope and detail to match appropriate DOE order requirements.

Finding SF-RP-02 [Reference APR-RP-02 and APR-RP-20]

Reports of inspections, audits, and resulting corrective actions taken are not maintained in a unified database and available for evaluation. (RP.12)

Discussion

A central database for radiological protection information and formal methods for use of the data in training and in evaluation of facilities did not exist at the time of this self-assessment. Programs have been developed since that time to address "Health Physics Records and Document Control" and appropriate uses of this information.

A similar finding was identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore (Concern RP.12-1).

Finding SF-RP-03 [Reference APR-RP-03]

Inspections and audits are not scheduled and performed as required in DOE Orders 5480.11 and 5482.1B. (RP.02)

Discussion

Inspections and audits performed at SNL at the time covered by the self-assessment lack the formality and documentation required by DOE Orders 5480.11 and 5482.1B. A program is being developed that will incorporate the

requirements of the referenced orders and be compatible with SNL audit programs. This was also noted as a concern at SNL, Livermore, by the Tiger Team (Concerns RP.1-1 and RP.2-1).

Finding SF-RP-04 [Reference APR-RP-01]

Managers and supervisors do not observe radiological protection activities to ensure adherence to established procedures. (RP.01)

Discussion

(See Finding SF-RP-01 for treatment of responsibility in radiological protection activities.)

Finding SF-RP-05 [Reference APR-RP-02, APR-RP-20]

Site/facility managers are not aware of applicable trends regarding radiation protection metrics. (RP.01, RP.12)

Discussion

The only radiological protection information routinely available to site/facility managers during the period covered by this self-assessment was personnel dosimetry. This same observation was listed as a key concern by the SNL, Livermore, Tiger Team. Programs have been developed to provide a central database for this information, and one is planned to provide metrics for use in tracking, analysis, and training, and for use by site/facility managers.

Finding SF-RP-06 [Reference APR-RP-02, APR-RP-20]

A program does not exist to fold accident and incident information into training activities at the worker level, and such information is not publicized appropriately within the company. (RP.01, RP.12)

Discussion

A central database for radiological protection information, including accident/incident reports, and formal methods for communicating this information to appropriate personnel did not exist during the period covered by this self-assessment program. These same shortcomings at the management level were observed as key findings by the SNL, Livermore, Tiger Team. Programs to correct both facets of this finding have been or are planned for development (see also Finding SF-RP-02 and SF-RP-33).

Finding SF-RP-07 [Reference APR-RP-03]

Internal audits are not in accordance with DOE Orders 5480.11 and 5482.1B. (RP.02)

Discussion

Internal audits performed on radiological protection programs as reviewed in this self-assessment lacked the formality in scope, depth, and scheduling rigor required in DOE Orders 5480.11 and 5482.1B. This same observation was a finding of the SNL, Livermore, Tiger Team (Concerns RP.2-1. Programs have been developed to address ES&H audit requirements at the directorate level. Procedures to tailor the directorate program to division internal audits as required in the referenced DOE orders need to be developed.

Finding SF-RP-08 [Reference APR-RP-04]

A program for radiation protection procedures, standards, control, and records has not been developed and maintained in a centralized historical file. (RP.03)

Discussion

The present state of noncompliance in this finding is due in part to the changing regulations and implementation of DOE Order 5480.11 and in part to the changing trends in the industry for increased documentation and hazards communication. Many of the elements needed to resolve the finding are currently being performed but are not documented. Resolution of the finding is currently under way in the form of program development. Completion and implementation of the health physics programs, which will require close cooperation between the line organizations and the Health Physics Division (3212), will ensure that the finding is resolved.

A similar finding was identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore (Concern RP.3-2).

Finding SF-RP-09 [Reference APR-RP-05]

SNL does not have a formal, documented survey of the workplace displayed on radiation work permits posted at entrances to work areas or maintained in a user friendly, centralized filing system. (RP.03, RP.05, RP.08, RP.10, RP.12)

Discussion

SNL does not currently have a radiation work permit (RWP) program, a radiation signs and labels program, or a document control and records program. Lack of formal program documentation and staffing are the primary factors contributing to these findings. Findings of this nature were listed as concerns by

the SNL, Livermore, Tiger Team (Concerns RP.3-3, RP.8-1, and RP.12-1). DOE Order 5480.11, Radiation Protection for Occupational Workers, and DOE Order 5480.19, Conduct of Operations Requirements for DOE Facilities, require that a formal process for radiation work permits, record and document control, and signs and labels (posting) be developed, documented, and implemented.

In response to these requirements, SNL has developed a program for each of these areas. The provisions of these programs follow.

* All SNL work activities involving ionizing radiation shall require a reviewed/approved ES&H SOP or RWP. Approved RWPs shall be used as one of the primary administrative controls by which radiological work is planned and radiation worker health and safety are addressed. Approved RWPs shall be used at SNL as a formal documented mechanism for radiation protection personnel to communicate radiological conditions and job controls to radiation workers.

* All radiological protection records shall be covered under a document control program. This program applies to all SNL facilities and operations that generate, distribute, and/or retain/dispose of radiological protection records and documents. This program encompasses all documents that:

    - Document conditions under which individuals were (and are) exposed to ionizing radiation at SNL, such as facility radiological conditions, and monitor conditions of personnel, property, and workplace surfaces

    - Record the appropriateness, quality, and accuracy of SNL monitoring methods, techniques, and procedures in use during any given time

    - Describe the technical and administrative basis for the SNL radiation protection program

    - Define the radiation safety training of SNL personnel and contractor personnel

* The general workplace compliance program provides an overview of the regulatory requirements necessary for line organizations to evaluate workplace requirements for ionizing radiation. This includes monitoring, release of equipment from radiological areas, posting, labeling, use of protective equipment, and exit and entry control requirements.

A regulatory matrix listing of the mandatory requirements, laws, and regulations used in developing each program has been developed. The matrix verifies the completeness and comprehensiveness of the programs.

Finding SF-RP-10 [Reference APR-RP-06]

The dosimetry program does not meet all requirements of ANSI 13.5-1972, ANSI N319-1976, ANSI N323-1978, and Department of Energy Laboratory Accreditation Program (DOELAP). (RP.05)

Discussion

The dosimetry program is being rebuilt around new dosimetry materials and equipment designed specifically to meet DOELAP and applicable ANSI standards of performance. Many of the required program elements and much of the documentation will be in place by mid-December 1990 when DOE auditors will review the dosimetry program. This observation was also made by the Tiger Team at SNL, Livermore (Concern RP.5-1).

Finding SF-RP-11 [Reference APR-RP-06]

A documented quality program with intercomparison studies has not been implemented to establish dosimetry program performance. (RP.05)

Discussion

A documented quality program is one of the required DOELAP elements. Program technical performance is measured by the DOELAP testing process.

Finding SF-RP-12 [Reference APR-RP-06]

Procedures for dosimetry operations are not available. (RP.05)

Discussion

Operational procedures are being developed in preparation for the DOELAP audit expected in December 1990.

Finding SF-RP-13 [Reference APR-RP-07]

Calibration facilities and procedures are not adequate to cover the range of exposures and energies of radiation anticipated. (RP.05, RP.08)

Discussion

Although calibration facilities at SNL are inadequate in energy and exposure range, dosimeter exposures were obtained from other DOE laboratories. The adequacy of this contract work has yet to be determined.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-14 [Reference APR-RP-08]

Technical criteria for the assignment of extremity dosimeters have not been documented. (RP.05)

Discussion

Contract help is in place to develop required dosimetry documentation.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-15 [Reference APR-RP-09]

Radiation histories are not available for all persons wearing radiation dosimetry. (RP.05)

Discussion

Radiation histories for all dosimetry users are not generally available for exposures before SNL employment. Responsibility to report this information generally remains with the prior employer(s) and has, therefore, not been given high priority by management. The acquisition of exposure history is currently dependent on the employee's memory of where he or she worked and dates of exposure. Because of the frailty of the process, we expect many histories to remain incomplete.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-16 [Reference APR-RP-10]

Nuclear accident dosimeter performance has not been documented to meet requirements of ANSI N13.3. (RP.05)

Discussion

A nuclear accident dosimeter that meets "model" performance requirements has been designed, built, and fielded. The dosimeter performance has not been tested because DOE has no well-documented and calibrated reactor facility to simulate a criticality accident.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-17 [Reference APR-RP-11]

The respiratory program does not comply with ANSI Z88.2 in defining responsibilities, training requirements, control and use of respirators, and fit testing. (RP.06)

Discussion

The SNL respirator program meets most of the requirements of ANSI Z88.2 but lacks the formal definition/documentation of responsibilities and requirements for training, control and issue of respirators, mask and fit testing, and breathing air purity.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-18 [Reference APR-RP-12]

Accurate and timely contamination/airborne radioactivity survey and in-vivo data are not available for use in the internal radiation control program. (RP.01, RP.03, RP.07, RP.09, RP.10, RP.12)

Discussion

SNL does not currently have an internal dosimetry in-vivo counting system or a contamination/airborne radioactivity survey program that fully meets the requirement of DOE Order 5480.11. The portion of this observation that addresses the timely availability of data to onsite management personnel was identified as a root cause by the SNL, Livermore, Tiger Team. Programs have been developed and in-vivo equipment ordered to correct all aspects of this finding.

Finding SF-RP-19 [Reference APR-RP-13]

Procedures are not available to identify workers who need to participate in the internal dosimetry program. (RP.07)

Discussion

Procedures need to be developed for identifying workers who need to participate in the internal dosimetry program. A contract is in place for these procedures to be written.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-20 [Reference APR-RP-13]

Procedures for in-vitro and/or in-vivo bioassay of visitors to radiation areas are not available. (RP.07)

Discussion

Contract help has been arranged to develop these procedures.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-21 [Reference APR-RP-13]

Performance criteria for in-vitro and/or in-vivo bioassay are not available. (RP.07)

Discussion

Contract help has been arranged to develop these performance criteria.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-22 [Reference APR-RP-13]

Whole body counting equipment is not calibrated and maintained on an established frequency. (RP.07)

Discussion

Whole body counting equipment has been purchased. Setup, calibration, and operation are hampered by lack of laboratory staff and laboratory space.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-23 [Reference APR-RP-14]

Instrument performance standards and site requirements are not documented. Documentation is not available showing that instruments meet all performance criteria. (RP.08)

Discussion

Current instrument practices lack formality and documentation of performance requirements. A formal program to document requirements and instrument performance is being developed.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-24 [Reference APR-RP-15]

The instrument calibration facility does not provide an adequate range of dose rates to calibrate instruments for all use situations. (RP.08)

Discussion

The current radiation calibration facility is capable of providing the required range of dose rates, but the facility is partially shut down because of mechanical and radiological problems. The facility can likely be restored to an adequate condition to provide the required dose rates.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-25 [Reference APR-RP-14]

Instruments have not been tested for sensitivity to special conditions such as radio frequency (RF) and magnetic fields. (RP.08)

Discussion

Some radiation monitoring instruments operate incorrectly under influence of special conditions such as magnetic fields and high-frequency electromagnetic fields. These external operational conditions do exist in a few locations at SNL.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-26 [Reference APR-RP-16]

Documentation of fixed monitor locations showing shielding effects is not available. Exposure rates in nearby locations cannot be determined in the event of a serious accident. (RP.08)

Discussion

Interpretation of instrument readings for all locations near the monitor can be influenced by materials and equipment in the instrument location.

This finding was not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-27 [Reference APR-RP-17]

An air sampling and monitoring program meeting the requirements of DOE Order 5480.11 has not been implemented at SNL. Specific areas noted that were not within requirements were air flow patterns and particle sizing; air sampling equipment procedures and calibrations; air sample counting procedures, including detection limits; determination of action levels; and the availability of the data from a centrally located/user-friendly database to operations personnel (through the health physics professional personnel) in the field. (RP.01, RP.09)

Discussion

At the time of this self-assessment, the air sampling and monitoring program at SNL was established on a case-by-case basis and tailored to the needs of the few specific locations involved. This approach does not fulfill the requirements of DOE Order 5480.11, primarily in the areas of documentation, standardization and uniformity of programs, and centralized data that are readily available in the field. Elements of this finding were reported as a concern by the SNL, Livermore, Tiger Team (Concern RP.9-1).

Finding SF-RP-28 [Reference APR-RP-18]

A radiation work permit program is not in place at SNL that includes the full elements of procedures, posting, training, area identification, protective equipment listing, and documentation/recordkeeping. (RP.03, RP.04, RP.05, RP.06)

Finding SF-RP-29 [Reference APR-RP-18]

The basis for selection of limits used for breathing air, surface contamination, and personnel contamination are not properly documented for all areas. (RP.10)

Finding SF-RP-30 [Reference APR-RP-18]

Counting procedures and records that are maintained will not pass new quality assurance/quality control reviews. (RP.03)

Finding SF-RP-31 [Reference APR-RP-18]

Survey frequency and survey methods for contaminated areas or potentially contaminated areas are not consistently implemented. (RP.10)

Discussion

The deficiencies in contamination control are primarily due to lack of documentation and/or inconsistent application of procedures throughout SNL. Many of the procedures currently in use are sufficient to meet the intent of the requirements but are lacking in documentation. Changes in contamination control philosophy at SNL to meet all applicable regulations will require not only the additional documentation but also a change in employees' attitudes toward contamination control. Implementation of the required procedures will require all personnel working in contaminated or potentially contaminated areas to put an extremely high priority on preventing the spread of contamination, and in fact, at times the contamination control will affect productivity. Thus, the implementation of additional procedures and documentation is only the first step in resolution of the findings.

The radiation protection programs currently under development address all the procedural and documentation requirements necessary to resolve the findings except those related to implementation and the effect of implementation on the line organizations. Additional funding and personnel for the Health Physics organization will be required. In addition, funds may be required for modification of facilities.

These findings were not specifically identified by the Tiger Team during its assessment of the radiological protection program area at SNL, Livermore.

Finding SF-RP-32 [Reference APR-RP-19]

The As-Low-As-Reasonably-Achievable (ALARA) program at SNL does not meet the general requirements of the document DOE/EV/1830-T5 or the specific requirements pertaining to staffing. (RP.11, RP.12)

Discussion

The SNL ALARA program does not currently meet all the requirements identified in DOE Order 5480.11, "Radiation Protection for Occupational Workers" and DOE/EV/1830-T5, "Health Physics Manual of Good Practices for Reducing Radiation Exposure Levels That Are As Low As Reasonably Achievable." This finding was also listed as a concern by the Tiger Team at SNL, Livermore (Concern RP.11-1). Several factors contribute to the areas of noncompliance in the ALARA program:

* lack of formal program documentation
* staffing
* lack of assignment of functional responsibility
* lack of management awareness
* lack of formal training

These factors, in addition to the previously mentioned findings, have been fully addressed in a newly developed corporate SNL ALARA program for Radiation Protection. DOE Order 5480.11 and DOE/EV/1830-T5 were used as primary implementing references in the development of this new program. The program institutes formality in the SNL ALARA process and a link to upper management oversight of the radiation protection program.

When fully implemented, the new ALARA program will:

* establish formal lines of communication and demonstrate an SNL commitment for an ALARA program

* increase awareness about the importance of maintaining ALARA ionizing radiation exposures

* define line organization and individual responsibilities and accountability for good radiation safety practices

* identify resource planning requirements, training, direction of management commitment, facility design, and necessary procedures

* emphasize the program elements and techniques that increase attention to the health physics radiation protection program

* meet requirements addressed in DOE Order 5480.19, "Conduct of Operations Requirements for DOE Facilities," for effectively controlling and performing operations (Chapter 1)

Finding SF-RP-33 [Reference APR-RP-20]

Radiation exposure records are not prepared and maintained consistent with ANSI N13.6. They do not include records related to work areas or records of corrective action taken in accidents/incidents and are not maintained in a protected central file that permits ease of auditing and trend analysis. (RP.01, RP.12)

Discussion

At the time of this self-assessment, radiation exposure records for personnel were maintained by Division 3213, and site-specific exposure records were located in the geographic area where they were produced. All UOR information was officially maintained by Division 3215; however, copies were also available in the concerned division. The completeness of the records does not meet the current requirements of DOE Order 5480.11 and ANSI N13.6. This observation was also made by the SNL, Livermore, Tiger Team in its report (Concern RP.12-1).

4.4.14.3 Action Plan Requirements

APR-RP-01. An action plan is needed to establish policies that clearly define management's responsibilities in ES&H and provide program- and procedure-writing instructions that ensure formal assignment of responsibilities to involved personnel.

APR-RP-02. An action plan is needed to establish a program to route radiological protection information to appropriate personnel for use in tracking, analysis, training, site evaluation, etc.

APR-RP-03. An action plan is needed to establish a program that meets the requirements of DOE Orders 5480.11 and 5482.1B in a manner consistent with the ES&H directorate audit plan.

APR-RP-04. The Health Physics Division (3212) is required to develop an action plan to resolve the finding. The action plan should include a timeline for completion of the health physics programs as well as a list of required personnel and funding for implementation of the program. Estimation of the impact of the programs will require input by line organizations.

APR-RP-05. An action plan needs to be developed that identifies all process steps necessary for ES&H organization implementation. The action plan will cover all program elements documented.

APR-RP-06. An action plan is needed to establish program corrective action that will meet all requirements of DOELAP, applicable ANSI standards, and DOELAP audit findings.

APR-RP-07. An action plan is needed to verify shortcomings of and improve SNL calibration capability.

APR-RP-08. An action plan is needed to develop technical criteria documentation as needed following the DOELAP audit.

APR-RP-09. An action plan is needed to establish and document a dose history program for dosimeter users. Establish formal requirements for obtaining dosimeter users' assistance in determining the extent of their exposure to radiation prior to joining SNL and obtaining the associated exposure records.

APR-RP-10. An action plan is needed to test and document the accident dosimeter performance when suitable test facilities are available.

APR-RP-11. An action plan is needed to establish a respirator program that meets the requirements of ANSI Z88.2 in defining/documenting the responsibilities and requirements for training, control and use of respirators, mask and fit testing, and breathing air purity.

APR-RP-12. An action plan is needed to establish procedures for programs associated with program elements RP.01, RP.07, RP.09, RP.10, and RP.12 that will permit coordination of information available for applications in training, engineered controls, entry posting/radiation work permit completions, tracking, analysis, and management/worker communications.

APR-RP-13. Procedures and performance criteria need to be developed for the internal dosimetry program to meet the DOE draft performance standard for internal dosimetry programs. Supporting laboratory equipment must be obtained, calibrated, and maintained for this program. Staff must be hired to support program operations.

APR-RP-14. An action plan is needed to develop documentation of instrument performance requirements for each instrument application. Instrument performance capabilities to meet or exceed performance requirements need to be documented.

APR-RP-15. An action plan is needed to rebuild the existing radiation calibration facility to meet radiological requirements and restore proper mechanical operation. The adequacy of the facility must be verified, and alternate calibration facilities must be located as necessary.

APR-RP-16. An action plan is needed to identify and document factors that may influence interpretation of instrument readings. Measurements may need to be performed and documented for later use. These data need to be updated as the facility or work location changes.

APR-RP-17. A comprehensive air sampling and monitoring program has been developed that addresses equipment, procedures, calibrations, calculations, documentation, communication, and training aspects of the air monitoring program. Specific procedures to establish details of this program need to be developed, and the required equipment must be obtained.

APR-RP-18. The Health Physics Division (3212) is required to prepare an action plan for resolution of the findings regarding contamination control. The action plan should include a timetable for completion and implementation of the plan as well as a list of required additional personnel and funding. In addition, line organizations may be required to supply facility-related funding requirements for modifications.

APR-RP-19. An action plan identifying all process steps required for ES&H organization implementation is needed for the ALARA program. This plan will include staffing requirements, management infrastructures to be developed, and hardware requirements.

APR-RP-20. An action plan is needed to develop a records program that meets the requirements of DOE Order 5480.11, ANSI N13.6, and DOE Order 1324.2A. Physical protection, easy data entry, and timely availability of information to authorized personnel are program design goals.

4.4.15 Personnel Protection

As appropriate to the organizational structure and the assignment of responsibilities at SNL, the program elements within the personnel protection (PP) program area have been addressed under the industrial hygiene (IH) and occupational safety (OS) program areas.

4.4.16 Industrial Hygiene

4.4.16.1 Overview

The Industrial Hygiene/Toxicology Division (3211) has the responsibility to maintain a program that meets the requirements of DOE Order 5480.10, Contractor Industrial Hygiene Program. The line supervision has the responsibility to ensure that the requirements of this program are met in their operations.

This section addresses the six IH performance objectives prescribed in the TSA manual. It incorporates the 62 findings noted by organizations responding to the FIS survey.

This section presents findings for industrial hygiene compliance at SNL (including Albuquerque, TTR, and KTF). Comparisons were made of the findings here against those findings and concerns identified by the Tiger Team at SNL, Livermore.

4.4.16.2 Significant Findings

Finding SF-IH-01 [Reference APR-IH-01]

The SNL, Albuquerque, industrial hygiene program does not totally convey and implement all the requirements of DOE Order 5480.10 at the line organization level. (IH.01)

Discussion

The industrial hygiene/toxicology staff are organized to cover both programmatic and organizational assignments. The technical requirements of DOE Order 5480.10 are well known to the professional industrial hygiene staff; however, implementation by SNL organizations is incomplete.

This finding was not specifically identified by the Tiger Team during its assessment of the personal protection program area at SNL, Livermore.

Finding SF-IH-02 [Reference APR-IH-02]

Subprograms and documentation of the industrial hygiene program are not formalized. (IH.02)

Discussion

Although some of the infrastructure exists for the industrial hygiene program, the subprograms need to be written and reviewed.

A similar finding was identified by the Tiger Team during its assessment of the personnel protection program area at SNL, Livermore (Concern PP.1-1).

Finding SF-IH-03 [Reference APR-IH-03]

A fully documented program to identify and evaluate all stresses in the workplace is not complete. (IH.03)

Finding SF-IH-04 [Reference APR-IH-04]

A complete surveillance of activities must be conducted to ensure effectiveness of controls. (IH.04)

Discussion

While some monitoring is conducted, it must be continued to ensure complete evaluations.

Similar findings were identified by the Tiger Team during its assessment of the personnel protection program area at SNL, Livermore (Concerns PP.3-1 and PP.4-1).

Finding SF-IH-05 [Reference APR-IH-05]

A documented system does not exist for the control and traceability of required industrial hygiene program records. (IH.05)

Finding SF-IH-06 [Reference APR-IH-06]

Although some needs are being met, training and awareness programs need to be strengthened and finalized. (IH.06)

Discussion

General hazard communications training and specific chemical module training have been completed. However, those users under the new OSHA Laboratory Standard must be addressed.

These findings were not specifically identified by the Tiger Team during its assessment of the personal protection program area at SNL, Livermore.

4.4.16.3 Action Plan Requirements

APR-IH-01. A program needs to be developed by Division 3211 to address all the requirements of DOE Order 5480.10. This plan must address the need for the industrial hygiene program to be fully communicated to line management supervision in order for line supervision to implement their responsibilities.

APR-IH-02. The subprograms must be written, reviewed, and approved. These subprograms must be made available to the line organizations.

APR-IH-03. A written program must be developed and implemented by Division 3211 to address the concerns of identification and evaluation of all chemical, biological, physical, and/or other environmental stresses arising in the workplace.

APR-IH-04. A plan must be developed by Division 3211 to ensure that monitoring requirements are met. The plan must also include procedures for notification of line supervision and employees.

APR-IH-05. A program needs to be developed by Division 3211 to address recordkeeping requirements.

APR-IH-06. An action plan must be developed by Division 3211 to address the Laboratory Standard OSHA 1910.1450 with respect to training and awareness.

4.4.17 Occupational Safety

4.4.17.1 Overview

This self-assessment evaluated the occupational safety program area at SNL against the performance objectives in each of the following program elements: Organization and Administration (OS.01), Procedure and Documentation (OS.02), Management of Safety Concerns (OS.03), Surveillance of Safety Concerns (OS.04), Compliance with Occupational Safety Standards (OS.05), and Personnel Communication Program (OS.06).

The occupational safety program area includes responsibilities for management and administration; documentation; training, interpreting codes and standards for the line; and quality control. Applicable DOE orders include 5480.1B (ES&H Program), 5480.4 (Standards), 5483.1A (Safety and Health at GOCO Facilities), and 5480.9 (Construction Safety and Health Program).

The responsibilities for the SNL occupational safety program are outlined in SLI 2001, and policy and implementation are documented in the ES&H Manual (SAND88-1161) and its appendices.

The Safety Engineering Divisions (3215 and 3216) are responsible for establishing criteria for all areas of industrial safety (including explosives) and construction safety, based on OSHA regulations, DOE orders, standards, and best practices. The divisions are also responsible for maintaining the corporate records of accidents and occupationally related illnesses. The corporate records

of certain policy-compliance activities are maintained by Safety Engineering, and the corporate files of the SOP system, including review and cancellation, have been the responsibility of Safety Engineering. Safety Engineering has had the responsibility for maintaining the ES&H Manual and for conducting new-hire ES&H orientation. They also maintain and service a film/video library for line use. A professional services contractor performs OSHA-type facilities inspections and prepares work orders for corrective action.

All six occupational safety program elements were evaluated by using 96 FIS responses, as well as by onsite observations and interviews with Safety Engineering staff and management.

Many of the performance criteria listed for the occupational safety program area are also covered in detail in Section 4.4.23 of this report, and the FIS responses for the worker safety and health compliance (OSHA), industrial program area supplement the FIS responses associated with this program area.

4.4.17.2 Significant Findings

Finding SF-OS-01 [Reference APR-OS-01]

Site and facility organization and administration are not configured to ensure effective implementation and control of the occupational safety program. (OS.01)

Discussion

Although the organization and the administration of the occupational safety program were considered to be adequate by SNL executive management in the past, the programs are not configured to ensure compliance of all operations with all applicable DOE orders, laws, and regulations. By SNL policy, line supervisors are responsible for the safe operation of their facilities. They use the ES&H Manual and the Safety Engineering divisions for guidance whenever they recognize or become aware of safety-related problems. Higher management responds to imminent dangers as detected, or to accidents and injuries in a reactive mode.

No programs were in place in July 1990 to ensure that line supervisors properly assess the risks or hazards of their operations, are trained with regard to current ES&H-related DOE orders, laws and regulations, or even use the guidance and advice of willing and available ES&H professionals. No real constraints exist to prevent supervisors from using their judgment to do what they perceive to be reasonable and safe from their own perspective. As can be seen in Section 4.4.23, Worker Safety and Health Compliance (OSHA), Industrial,

supervisors and employees are still generally not aware of the requirements that pertain to their activities. No anticipatory, documented process exists to inform them.

The foregoing deficiencies were also identified by the Tiger Team in its appraisal of the overall program at SNL, Livermore (Concerns PP.1-1, OA.1-1, and OA.1-2, Findings M1 through M6).

Finding SF-OS-02 [Reference APR-OS-02, APR-OS-05]

Procedures and documentation do not provide appropriate direction, record generation, and support for the occupational safety program. (OS.02)

Discussion

The SNL ES&H Manual (SAND88-1161) is used by SNL supervisors as the definitive ES&H guidance document. The manual does not cross-reference applicable DOE orders, laws, and regulations and does not contain the quantitative, descriptive information required to ensure that supervisors know what they need to know. Other documents, including SAND88-1162 (Guidelines for the Preparation of Safe Operating Procedures) and a SHEAC Questions and Answers document, provide policy, procedures, and direction. Quality elements are not formally integrated into these documents. They are useful to sensitize supervisors on specific requirements and to facilitate adequate follow-up for further information.

Recordkeeping requirements are not fully documented, and records are not always properly maintained regarding tests of apparatus, training of employees, tracking and disposition of audit findings, exposure of employees to radiation and chemicals, and facilities-related deficiencies.

These findings were also addressed by the SNL, Livermore, Tiger Team (Concerns OA.7-1, OP.3-1, and OP.3-2).

Finding SF-OS-03 [Reference APR-OS-03]

No systematic processes or programs are in place to ensure that all physical and/or other environmental stresses occurring in the work place are identified, evaluated, and controlled. (OS.03)

Discussion

Line supervisors review their operations and can use their own judgment, sometimes assisted by ES&H professionals, to decide if an SOP is desired or necessary. The SOPs created by line supervisors are reviewed and approved by appropriate ES&H professionals to ensure that hazards are properly evaluated and controlled from the Directorate 3200 perspective.

No formal program existed in July 1990 that would require a rigorous and comprehensive study of all SNL operations with regard to hazards assessment. This deficiency was identified by the SNL, Livermore, Tiger Team (Concerns OA.5-1, PP.3-1, and PP.4-2).

Finding SF-OS-04 [Reference APR-OS-04]

Although periodic walk-through surveys are performed by supervisory and management personnel to identify existing and potential occupational safety concerns, the effectiveness of the surveys is limited. (OS.03)

Discussion

Supervisory and management personnel are normally not sufficiently knowledgeable about the details of the pertinent DOE orders, laws, and regulations to perform the in-depth analysis required to ensure compliance with regulations. Those walk-throughs prescribed by SNL policy, SHEAC policy, and independent audits are documented, and findings are tracked. In-depth, comprehensive, organization-wide audits are not performed.

This deficiency was identified by the SNL, Livermore, Tiger Team (Concerns OA.3-1, OA.5-1, and PP.1-2).

Finding SF-OS-05 [Reference APR-OS-03, APR-OS-04, APR-OS-06]

Appropriate surveillance of activities is not conducted to measure safety performance and ensure the continued effectiveness of controls. (OS.04)

Discussion

A formal and adequate accident, injury, and unusual occurrences reporting system is in place and is being improved and expanded. Investigations of varying degrees of complexity are conducted for all reported injuries and occurrences to identify probable causes and methods of prevention.

Analysis of accident trends and appropriate comparisons are conducted routinely and for special uses, such as statistics and trends for a particular organization, parts of the body injured, or injuries occurring in a particular location.

The construction safety program is detailed in SAND89-0889, "Guideline for Preparing a Contractor Safety Plan." Language used in construction contracts is written to require that contractors adhere to all regulations applicable for ES&H.

Directorate 7800 has prime responsibility for construction safety, with professional oversight being provided by Department 3210. See Section 4.4.24.1, Overview, Worker Safety and Health Compliance (OSHA), Construction.

A system for surveillance of personnel exposure to hazards in the workplace does exist and is under the responsibility of Divisions 3211, 3212, and 3213. Accident reports are retained for investigations conducted by the Safety Engineering Divisions (3215 and 3216).

This finding was also identified by the SNL, Livermore, Tiger Team (Concerns OA.5-2 and PP.1-2).

Finding SF-OS-06 [Reference APR-OS-03]

Workplaces are not free of uncontrolled physical safety concerns and are not in compliance with DOE-prescribed occupational safety standards.

Discussion

Recordkeeping and documentation is not always in place to support this concern from an auditability standpoint. Prior ES&H audits, such as performed by SHEACs, have identified uncontrolled physical safety concerns. Since root causes were not identified and corrected, it is to be expected that other undetected hazards exist.

A lockout/tagout program has been written, and basic training has been conducted. Coordination with the line and Division 3211 interfacing organizations (Industrial Hygiene, Fire Protection, Facilities Engineering, etc.) has taken place. Locking devices and signs are available, but the program has not been fully implemented.

The inspection and preventive maintenance program for powered platforms, hoisting and rigging devices, cranes, and other powered tools and machinery is the responsibility of the Facilities Engineering Department (7810). While the Environment, Safety, and Health Directorate (3200) does have responsibility for occupational safety, the interface with Facilities Engineering has not been formally defined, and the process for documenting the adequacy of such programs has not been formally defined from an occupational safety standpoint.

The recently adopted concept of facilities ownership of space will improve housekeeping and other areas that, because of common use, seemed to fall under no organization's responsibility for maintenance, repair, or safety considerations.

The finding regarding the lockout/tagout program was also noted by the SNL, Livermore, Tiger Team (Concern OP.4-1).

Finding SF-OS-07 [Reference APR-OS-04]

Site/facility personnel are not adequately informed of physical stresses that may be encountered in their work environment.

Discussion

According to SNL policy, the line supervisor is responsible for training employees regarding the hazards that may occur in the work area, for ensuring that employees who operate under an SOP are adequately trained, and for documenting that training.

Formal ES&H orientation of new employees was discontinued pending preparation of a new orientation program. This program was delayed to redirect resources for the ES&H initiative in 1989 and for continuing activities of a special nature (i.e., self-assessment, etc.). The new orientation video needs to be completed and orientation reinitiated.

Formal training for specific hazards, such as HazCom elements, explosives, cranes, hoists and rigging, etc., has taken place and is formally documented. Courses are introduced and scheduled as needs are identified, to the extent resources are available. Directorate ES&H coordinators responsible for scheduling, cataloging, and keeping records of training have contributed to a more formal, better-documented process.

Information regarding occupational safety rights and obligations has been distributed and discussed with all employees. Required meetings are documented and provide a forum for employee discussion of safety concerns.

This finding was not specifically identified by the Tiger Team during its assessment of the personnel protection program area at SNL, Livermore.

4.4.17.3 Action Plan Requirements

APR-OS-01. SNL needs to develop and implement a new ES&H program that will formally define and document compliance requirements, responsibilities, and authorities among safety engineering and other concerned organizations. The program needs to ensure that SNL will comply with the requirements of DOE Orders 5480.1B, 5480.4, 5480.9, and 5483.1A.

APR-OS-02. Directorate 3200 needs to rewrite the ES&H Manual to incorporate updated policies, procedures, and programs (see APR-KF-05).

APR-OS-03. SNL needs to develop and implement a comprehensive program for preliminary hazard analysis (PHA) throughout the Laboratories. All PHAs should be reviewed by Directorate 3200 professionals to ensure that the hazards

identified are properly evaluated and controlled.

APR-OS-04. ES&H training, particularly with regard to hazard identification and compliance requirements, needs to be provided to all employees who participate in ES&H audit and oversight functions.

APR-OS-05. A program needs to be developed and implemented by Department 3210 to address the need for an integrated health and safety data recording, retrieval, and manipulation system (see APR-WS-01).

APR-OS-06. Division 3215 needs to develop and implement a construction safety program, to train SNL construction inspectors so that Department 7850 (Facilities Construction and Environmental Engineering) can ensure contractors comply with the requirements of DOE Orders 5480.9 and 5483.1A, as they relate to OSHA - Construction (see APR-KF-06).

4.4.18 Fire Protection

4.4.18.1 Overview

This self-assessment evaluated the fire protection (FP) program area against the performance objectives in each of the following program elements: Organization and Administration (FP.01), Life Protection (FP.02), Public Protection (FP.03), Impairment of Operations (FP.04), Property Protection (FP.05), Fire Department Operations (FP.06), and Program Implementation (FP.07).

All seven fire protection program elements were evaluated through 34 FIS responses as well as through onsite observations and interviews with fire protection staff and management.

The FP program area includes responsibilities for management and administration; documentation; training; fire protection design, engineering, inspection, testing, and maintenance; fire prevention; and emergency response. Fire protection engineering includes fire hazards analyses and mitigation, evaluation of dollar values at risk to damage, and quality control. Also included are those areas addressing damage from wind, lightning, water, hail, and some explosions. Applicable DOE orders include Orders 5480.7 (Fire Protection), 5480.4 (Standards and Codes), and 6430.1A (General Design Criteria).

SNL has traditionally maintained a Highly Protected Risk level of fire protection, equal to that of the nation's best industrial facilities. The broad responsibilities for fire protection are outlined in SLI 2001, which designates Directorate 7800 as the entity responsible for appointing an SNL, Albuquerque, fire marshal and directing the fire prevention and protection program. However, the SLI does not cover TTR or KTF, nor does it appoint a Corporate Fire Marshal.

The Facilities Safety and Environmental Engineering Division (7853) establishes fire protection and prevention procedures. The Electrical Utility Systems Section (7811-4) performs maintenance and QA tests and inspections on detection and alarm systems (National Fire Protection Association (NFPA) 72 series) and sprinkler systems (NFPA 13 and 13A). The inspection, testing, and maintenance of fixed gaseous and dry chemical suppression systems (NFPA 12 and 12A) are performed by contractors. The Equipment Maintenance Section (7812-4) installs, inspects, and maintains fire extinguishers (NFPA 10) and emergency lights and exit sign illumination (NFPA 101). The Mechanical Utility Systems and Central Steam Plant Section (7811-2) inspects, operates, and maintains the fire water distribution (NFPA 22, 24, and 26) and boiler control (NFPA 85) systems. The Remote Areas Maintenance Division (7818) inspects, tests, and maintains the emergency lights and exit sign illumination, as well as the remote areas fire water supply and distribution systems. The Operations Engineering Division (7816) is responsible for the lightning protection systems (NFPA 78) and elevators (ANSI 17.1). An outside contractor performs fire prevention inspections and prepares work orders for corrective actions.

SNL, Albuquerque, currently ensures fire fighting support through a 1990 Interdepartmental Support Agreement with Kirtland Air Force Base (agreement number DE-AI04-90AL55855). For a monthly reimbursement from DOE/AL, Kirtland's Fire Department provides all DOE/AL areas with fire fighting support and pre-fire planning in accordance with Air Force Regulation 92-1 and NFPA standards.

TTR through DOE/AL is currently negotiating with the Air Force for fire fighting support. KTF, at the Pacific Missile Range Facility (PMRF), is provided fire fighting support through an agreement with the Navy (PMRF/DOE agreement number NO534A-87274-028) on a nonreimbursable basis.

A corporate-level fire protection program is being established to strengthen fire protection at all four SNL sites (Albuquerque, Livermore, TTR, and KTF). This program will define corporate and site responsibilities, designate Corporate and Site Fire Marshals, and establish a Corporate Fire Protection Council to oversee the program and implement policy. Increased formality of operations will increase program accountability, auditability, and effectiveness.

The fire protection program will also require a management and implementation plan for each site, Fire Protection Practices and SOPs with addenda for site-specific instructions, and revision of SLI 2001 to implement this program.

4.4.18.2 Significant Findings

Finding SF-FP-01 [Reference APR-FP-01]

The authorities, responsibilities, and interfaces of the various groups within the fire protection program are neither well defined, documented, nor understood. (FP.01, FP.07)

Discussion

Although the organization and administration of the fire protection program were adequate in the past, they are inadequate with respect to the current DOE requirements regarding formality of operations and auditability. At present, the formally approved corporate policy statement and fire protection program, as well as the associated implementing procedures necessary to achieve compliance with all mandated requirements, do not exist.

The authorities and responsibilities for the fire protection program at SNL are fragmented among various groups. This fragmentation of responsibilities has led to ineffective and inefficient operation of the fire protection program, inconsistent and decentralized documentation and document storage efforts, differing priorities among organizations, and unclear lines of authority. For example, in one department, personnel who were assigned to the Building Evacuation and Fire Team were uncertain as to the length of their assignments or whether their terms had expired. Information regarding the Building Evacuation and Fire Team is not provided directly to employees, but instead is given to the Team Captain, who may or may not post that information at designated locations in the various buildings onsite.

This self-assessment identified weaknesses in the area of training. Fire protection, maintenance, and inspection supervisors and staff were found to be lacking training in the program requirements, and contractors were not sufficiently trained in their inspection, maintenance, repair, and reporting duties. The lack of a consistent, formal fire protection training program has resulted in a lack of understanding on the part of personnel regarding their authorities and responsibilities with respect to their fire protection program assignments. In one instance cited, personnel had received training in the use of fire extinguishers, but not for a number of years.

Furthermore, the existing program does not address fire protection activities at TTR or KTF, the interfacing activities with the emergency preparedness and security programs, or corporate Quality Assurance oversight of the fire protection program.

Recognizing the inadequacies of the existing fire protection program, SNL is developing a corporate Fire Protection Program. This new program will formally define and document the responsibilities, authorities, accountabilities, and interfaces within the fire protection program organization. The new program will also specify the training and certification and documentation requirements associated with the performance of activities related to fire protection.

The foregoing deficiencies were also identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore (Concern FP.1-1).

Finding SF-FP-02 [Reference APR-FP-01]

Adequate staffing and resources are not allocated to support and maintain compliance with fire protection administration, documentation, training, engineering, maintenance, testing, and inspection requirements. (FP.01, FP.07)

Discussion

The existing SNL fire protection program, as well as the existing staffing and resource allocations, are recognized as inadequate to achieve compliance with all mandated requirements. Therefore, an SNL corporate Fire Protection Program is being developed to address the current requirements. This program will determine the requirements, laboratory policy, and the need for formal implementing procedures to achieve compliance.

This new program will call for establishing an SNL Corporate Fire Protection Council and creating Corporate and Site Fire Marshal positions. The Council should develop, approve, issue, and control corporate documentation (e.g., SOPs). The Corporate Fire Marshal should be responsible for implementing the corporate program and should have the authority to enforce SNL fire protection policy. The Site Fire Marshals should be responsible for implementing the Corporate Fire Protection Program at their sites and should have the authority to develop a site-specific management and implementation plan. They should also develop site-specific addenda to the program practices and procedures.

To achieve compliance with DOE-mandated requirements, the management at the Laboratories will have to commit resources to implement corporate and site-specific fire protection programs.

This finding was not specifically identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore.

Finding SF-FP-03 [Reference APR-FP-01]

The current fire protection program does not contain all of the procedures and processes necessary to ensure full compliance with all applicable DOE orders, regulations, codes and standards, and other requirements, including the Life Safety Code (NFPA 101). (FP.02, FP.07)

Discussion

As noted in Findings SF-FP-01 and SF-FP-02, the existing SNL fire protection program is inadequate to achieve compliance with all mandated requirements. The corporate Fire Protection Program currently under development will determine the requirements, policy, and need for formal implementation procedures and documentation to achieve compliance.

The self-assessment revealed that fire protection systems and equipment were not inspected, tested, or maintained in accordance with the requirements of DOE Order 5480.7 and the applicable NFPA codes and standards. Inspection, testing, and maintenance activities were found to be incomplete and not fully documented. Where contractors were responsible for performing fire protection-related inspection, testing, and maintenance, no processes existed for ensuring satisfactory contractor performance or proper documentation of contractor activities. As part of an upgraded fire protection program, procedures should be developed to ensure that inspection, testing, and maintenance of fire protection systems and equipment meet prescribed requirements to ensure that contractor performance is monitored and to ensure that contractor activities are properly documented.

In addition, it was found that the existing fire protection program does not include a formal process for ensuring that modifications or renovations to existing SNL facilities are subject to a fire protection engineering review. There is no documentation of fire protection engineering reviews of small construction projects, although the review of large projects is documented. Processes to ensure that all required fire protection engineering reviews are performed and documented should be incorporated into an upgraded fire protection program.

Although SNL, Albuquerque, generally complies with the Life Safety Code (NFPA 101), it is recognized that a system is required throughout the Laboratories for identifying, reporting, and tracking the resolution of Life Safety Code deficiencies, as well as other fire protection issues. Within the scope of this system, the implementation of alternative life safety provisions

where strict code compliance cannot be achieved should be identified, documented, and tracked. Verification of the system's effectiveness should be accomplished by periodic field inspections and QA audits. Also, SNL, Albuquerque, has not complied with Chapter 33 (Exits) in the Uniform Building Code (UBC). In particular, the UBC requires one-hour fire-resistant corridors even in buildings with sprinkler systems. However, the Life Safety Code allows exception from the corridor fire resistance requirements if the building has a sprinkler system.

The self-assessment also identified these deficient areas: (1) existing SOPs did not always address the risk of fire and (2) the Fire Hazard Analysis associated with each SNL, Albuquerque, facility either was out of date or had not been prepared. An upgraded fire protection program should require that site-specific procedures address the risk of fire, as appropriate, and that Fire Hazards Analyses be prepared and updated at specified frequencies.

The foregoing deficiencies regarding Life Safety Code compliance; the inspection, testing, and maintenance of fire protection systems and equipment; and fire protection engineering reviews were also identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore (Concerns FP.2-1 and FP.7-1).

Finding SF-FP-04 [Reference APR-FP-01]

Inspections have revealed the installation of deadbolts on the inside of exit doors from secured vaults, rooms, and buildings in violation of the Life Safety Code. (FP.02)

Discussion

Ongoing inspections are being performed to identify any similar conditions of noncompliance. Security and fire protection personnel are working to resolve the deficient conditions and preclude their recurrence.

The foregoing deficiency was also identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore (Concern FP.2-1).

Finding SF-FP-05 [Reference APR-FP-01]

Existing fire protection program documentation provides inadequate assurance that onsite facilities and operations have been evaluated regarding their potential threat to the public or environment in case an onsite fire causes the release of unacceptable levels of hazardous materials beyond the site boundary. (FP.03)

Discussion

As noted in Finding SF-FP-03, the self-assessment identified the following: (1) existing line SOPs did not always address the risk of fire and (2) the Fire Hazard Analysis associated with each SNL, Albuquerque, facility was either out of date or had not been prepared. None of the Fire Hazard Analyses that had been performed reported whether adequate protection had been provided, as required by DOE Order 5480.7, to prevent any added threat to the public or environment as the result of an onsite fire causing the release of hazardous materials beyond the site (or facility) boundary. Furthermore, the Fire Hazards Analyses did not include a formal Life Safety Code review. In addition, the self-assessment revealed that the existing Fire Hazard Analyses were not formally reviewed and approved by management, and that a formal process for management review and approval did not exist.

To address this finding, a formally documented Fire Hazard Analysis program is being initiated to identify all SNL facilities with a potential for releasing hazardous materials beyond the site (or facility) boundary as the result of an onsite fire. Within the scope of this program, each Fire Hazard Analysis will include a Life Safety Code review. A Safety Analysis Report or similar study will then be prepared for each facility so identified to determine what, if any, additional protection is required. Within the context of this program, it will be necessary to define what constitutes a "hazardous material," the threshold values associated with a hazardous material release beyond which additional protection is required, and what constitutes a "facility" within SNL. Means of controlling liquid runoff from fire fighting operations should also be addressed in this program.

This finding was not specifically identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore.

Finding SF-FP-06 [Reference APR-FP-01]

The performance of fire hazards analyses is not formally documented, and the frequency for the review and update of those analyses is not formally established. (FP.05, FP.07)

Discussion

As noted in Finding SF-FP-03, the self-assessment found that the Fire Hazard Analysis associated with each SNL, Albuquerque, building had not been reviewed or updated on a regular basis. In part, the lack of properly updated documentation can be attributed to insufficient staffing; however, it can be further attributed to the lack of a program requiring formal documentation of the analyses performed and their review and update at a specified frequency as prescribed by DOE Order 5480.7.

Within the scope of an upgraded fire protection program, a process needs to be established that will specify the requirements for preparing a Fire Hazards Analysis, the associated documentation requirements, and the requirements for periodic review and update.

The foregoing deficiency was also identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore (Concern FP.7-1).

Finding SF-FP-07 [Reference APR-FP-01]

Certain onsite operations and activities may be vulnerable to impairment or shutdown for an unacceptable period of time, or suffer an unacceptable fire loss (per DOE Order 5480.7), as the result of a credible fire. (FP.04)

Discussion

There are no current Fire Hazards Analyses to document that the automatic fire detection and suppression systems, as well as the emergency response provided by the Kirtland Air Force Base Fire Department, are adequate to limit the extent and programmatic impact of a credible fire in most buildings equipped with automatic sprinklers. With the increasing sophistication and miniaturization of computers and other assemblies, even a small fire that is controlled by one or two sprinklers could result in unacceptable program delays if software or one-of-a-kind hardware is destroyed. Similarly, a small fire involving a device from another DOE or DoD facility or contractor that is undergoing field testing at SNL might also result in unacceptable program delays at SNL or another DOE or DoD facility.

These concerns need to be evaluated and actions taken to the extent practicable to preclude the impairment of operations as the result of a credible fire. Such actions may include the use of fireproof safes or other facilities for software and data storage. In addition, the evaluations performed should determine if an operation or facility is considered "critical" or "important."

This finding was not specifically identified by the Tiger Team in its appraisal of the fire protection program at SNL, Livermore.

Finding SF-FP-08

The existing Interdepartmental Support Agreement between the DOE and the Air Force regarding fire fighting support to SNL, Albuquerque, is inadequate in its content and should be revised by DOE/AL. (FP.06)

Discussion

At SNL, Albuquerque, fire fighting support is provided by Kirtland Air Force Base under an Interdepartmental Support Agreement between the DOE and the Air Force. This agreement is vague with respect to requirements for fire department manning and other resources, the frequency and adequacy of fire department training, the frequency of site familiarization tours, communications protocol, emergency activation levels, and pre-fire plans. Furthermore, from the SNL point of view, the requirements of the Air Force's fire protection program at KAFB appear inconsistent with the fire protection program requirements mandated by DOE orders and those codes and standards applicable to operations at SNL, Albuquerque.

In addition to its agreement with the DOE, KAFB also has a Mutual Aid agreement for structural fire fighting assistance with the City of Albuquerque and an agreement with the US Department of Agriculture (DOA) for responding to wildland fires. Although KAFB Fire Department personnel have received training in fighting fires involving hazardous or radioactive materials, it is unclear whether the City or US DOA personnel have received similar training.

Normally, the KAFB Fire Department has the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner. However, as a result of the temporary reassignment of KAFB Fire Department personnel to Desert Shield-related activities, the level of KAFB Fire Department support available to SNL, Albuquerque, may be impaired.

SNL has advised the Management Support Division of DOE/AL of the temporary staffing reductions at the KAFB Fire Department and of the need for DOE/AL to review and revise, as necessary, the DOE/Air Force Interdepartmental Support Agreement. Accordingly, no Action Plan Requirement is needed for this finding.

Finding SF-FP-09

An Interdepartmental Support Agreement for fire department support has not been formally established with the Air Force for TTR. (FP.06)

Discussion

Per discussions with the DOE, the SNL fire fighting capability at TTR is not considered to be a fire department in accordance with the provisions of NFPA 1500. However, the Air Force maintains a fully trained and equipped fire department at TTR. Therefore, the DOE is pursuing an Interdepartmental Support Agreement with the Air Force to provide backup fire fighting capability at TTR. Accordingly, no Action Plan Requirement is needed for this finding.

4.4.18.3 Action Plan Requirements

APR-FP-01. SNL is developing a corporate Fire Protection Program. This new program will formally define and document the DOE compliance requirements, responsibilities, authorities, accountabilities, and interfaces within the fire protection program organizations. The new program will also specify the training and certification requirements, as well as the documentation requirements, associated with the performance of the fire protection-related activities.

Specifically, the program will:

* Apply to all four SNL sites (Albuquerque, Livermore, TTR, and KTF)

* Determine the requirements, laboratory policy, and need for formal implementing procedures to achieve compliance

* Require a Management and Implementation Plan that establishes a Corporate Fire Protection Council and creates Corporate and Site Fire Marshal positions

* Require development of site-specific Management and Implementation Plans for all four sites

* Require development of site-specific addenda to the program practices and procedures

* Meet the requirements of applicable DOE orders, criteria, guides, and DOE-mandated fire protection codes and standards

* Meet or exceed the "Improved Risk" level of industrial fire protection (DOE Order 5480.7)

* Require that the design and construction of facilities meet fire protection and life safety requirements of DOE Orders 6430.1A (General Design Criteria) and 5480.7 (Fire Protection)

* Follow the requirements of the National Fire Protection Association's National Fire Codes and other fire protection documents as mandated by DOE Order 5480.4 (Environmental, Safety, and Health Standards)

* Fulfill the ES&H corporate policy related to fire protection as set forth in SLI 2001

* Require the conduct of periodic fire hazard analyses and facility surveys to assess fire hazards, life safety and fire protection features, and the impact of fire on programs and property

* Report annually to DOE loss experience of the previous year

* Require the development and publication of fire protection practices and procedures, and periodic reviews and updates of those documents

* Link with SNL procedures for responding to findings as a result of internal and external audits

* Link with SNL's program for self-assessment to assure continuing compliance

* Require oversight of fire protection functions by the ES&H and Quality directorates

* Provide guidance and support to SNL organizations tasked with the execution of the fire protection program procedures

To achieve compliance with DOE-mandated requirements, management at the Laboratories will have to commit resources to implement corporate and site-specific fire protection programs.

4.4.19 Aviation Safety

4.4.19.1 Overview

The self-assessment evaluated the aviation safety (AS) program area against the performance objectives in each of the following program elements, which included Organization and Administration (AS.01), Operations (AS.02), Maintenance (AS.03), Life Support Equipment (AS.04), Physical Security (AS.05), and Operating Experience (AS.06).

All six aviation safety program elements were evaluated through 13 FIS responses and through interviews and meetings with engineering design and test personnel and DOE and Ross Aviation personnel. Only one (AS.02) of the six program elements included TSA performance criteria to assist in determining whether a performance objective had been met.

Ross Aviation provides air freight and passenger services for SNL in accordance with the terms and conditions of its contract with the DOE (DE-AC04-89AL52318). In general, the performance of such services requires Ross Aviation to furnish all necessary personnel, materials, and equipment (except as otherwise furnished by the Government) to maintain and operate Government-furnished aircraft based at Albuquerque, Las Vegas, and Tonopah. When charter aircraft are leased from civilian contractors, specific advance approval from DOE/AL is required.

SNL often supplies instrumentation and experimental configurations to Ross Aviation for incorporation into and on aircraft for flight tests. The installation of instrumentation and experimental configurations on test support aircraft requires reviews for compliance with DOE and FAA requirements. SNL has established a Safety Review Committee to evaluate each test program and the associated modifications or reconfigurations to ensure that safe and productive tests are performed; however, no formal documentation exists describing its reviews.

As a result of this self-assessment, some operations have been suspended pending the resolution of aviation safety-related deficient conditions.

4.4.19.2 Significant Findings

Finding SF-AS-01 [Reference APR-AS-01]

SNL does not meet DOE and Federal Aviation Administration (FAA) requirements regarding instrumentation and experimental configurations supplied to Ross Aviation for incorporation into and on aircraft for flight tests. (AS.04)

Discussion

As stated, a Safety Review Committee has been established to evaluate each test program and the associated modifications or reconfigurations to be placed into or on aircraft for flight tests. However, no documentation describing the function and reviews of this committee exists. In addition, responsibilities need to be established between SNL engineering and testing organizations, Ross Aviation, and DOE/AL to verify compliance with DOE and FAA orders and regulations regarding in-flight tests. New SOPs or revisions to current SOPs are required.

The Tiger Team did not specifically evaluate the aviation safety program area at SNL, Livermore.

Finding SF-AS-02 [Reference APR-AS-02]

Procedures for obtaining commercial aircraft charter services from civilian contractors need to be prepared by SNL and reviewed and approved by DOE. (AS.01)

Discussion

DOE/AL requires its contractors to submit, for prior approval, all requests for using commercial charter aircraft (e.g., helicopters). SNL, Albuquerque, has no written procedures for obtaining the services of chartered aircraft.

The Tiger Team did not specifically evaluate the aviation safety program area at SNL, Livermore.

4.4.19.3 Action Plan Requirements

APR-AS-01. A program needs to be established to (1) evaluate the airworthiness of systems being proposed for in-flight testing, (2) retain a Designated Engineering Representative (DER) to research and define all applicable regulatory criteria, and (3) reestablish the Safety Review Committee for experiments. An interface control document (ICD) will need to be prepared to define specific responsibilities, authorities, and interfaces of SNL, Ross Aviation, and DOE/AL regarding in-flight test programs.

APR-AS-02. Formal procedures need to be developed to address contracts for charter aviation services with civilian contractors. These procedures require input from engineering, testing, and traffic organizations and should be submitted to DOE/AL for approval.

4.4.20 Medical Services

4.4.20.1 Overview

The self-assessment evaluated the medical services (MS) program against the performance objectives in five program elements: Organization and Administration (MS.01), Procedures and Documentation (MS.02), Medical Treatment (MS.03), Review and Audit (MS.04), and Personnel Communication Program (MS.05).

All five medical services performance objectives were evaluated through 16 FIS responses. Discussions and interviews with the Medical Director and members of the medical organization staff and several meetings also occurred.

The medical services program area at SNL, Albuquerque, is administered by the Medical Directorate (3300), which is responsible for the facilities, personnel, and equipment that support the Laboratories for routine and emergency medical needs in accordance with DOE Order 5480.8. The Medical Directorate's goals are to help provide a healthful place to work, provide emergency medical care and occupational health services, consult and advise on personal health concerns, and provide health promotion programs. The directorate is staffed by physicians, nurses, and other professionals concerned about the health of the employee body. They are located in Buildings 831 and T-13, adjacent to Area 1.

The medical services provided at TTR and KTF are through a collaborative arrangement involving REECO, Air Force, and Navy medical personnel, and private physicians, as appropriate to the particular site.

4.4.20.2 Significant Findings

Finding SF-MS-01 [Reference APR-MS-01]

The medical services buildings (Buildings 831 and T-13) need comprehensive fire protection assessments. (MS.03)

Discussion

The medical services buildings require comprehensive fire protection assessments, to identify all potential fire hazards that may exist in the buildings.

This finding was not specifically identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore.

Finding SF-MS-02 [Reference APR-MS-02]

A comprehensive assessment throughout the site of the hazards present is required to provide a basis for the medical surveillance programs. (MS.01, MS.05)

Discussion

A formal program does not currently exist for identifying the hazards present in all activities conducted onsite. Therefore, it is not possible to identify and implement all of the medical surveillance programs necessary to ensure compliance with DOE Order 5480.8. Problem areas, such as the presence of asbestos in Building 892, are addressed on a case-by-case basis at the present time.

This finding was not specifically identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore. However, that assessment found that there was no documented mechanism for medical services personnel to receive full and timely information on all physical, chemical, and biological agents to which employees are exposed (Concern MS.5-1).

Finding SF-MS-03 [Reference APR-MS-04]

Medical services procedures, policies, and reports are not formally documented nor regularly audited. (MS.02, MS.04)

Finding SF-MS-04 [Reference APR-MS-05]

Medical services-related Quality programs exist; however, they may not be consistent with the Quality programs currently under development throughout the corporation. (MS.02, MS.04)

Discussion

Complete, formal medical services policies and procedures that conform to OSHA and DOE Order 5480.8 requirements are not in place. Although required medical services reports are satisfactory, formal documentation is lacking. In addition, existing policies and procedures are not audited on a regular basis. Medical services personnel participate in emergency preparedness drills and exercises, and their actions are critiqued; however, these drills and exercises are conducted on an infrequent basis.

A formal quality management program does not exist for tracking the correction of identified deficiencies in the medical services programs and deviations from prescribed practices.

Similar deficiencies were identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore (Concerns MS.2-1 and MS.4-1).

Finding SF-MS-05 [Reference APR-MS-08]

The responsibilities, authorities, and interfaces of personnel and organizations providing medical services (both onsite and offsite) require formal documentation. (MS.01, MS.02)

Discussion

The specific responsibilities, authorities, and interfaces of SNL medical services personnel have not been formally documented. In addition, the Memoranda of Understanding between SNL, Albuquerque, and nearby community hospitals need to be updated.

Furthermore, there are no organized medical services programs at KTF and TTR. Some memorandum of understanding (MOU) and written agreements (other than contracts with private physicians) exist, but they need to be updated.

A similar finding was identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore (Concern MS.4).

Finding SF-MS-06 [Reference APR-MS-06]

Additional medical staff is needed to meet regulatory requirements. (MS.03)

Discussion

Additional medical staff is needed to meet ES&H and regulatory demands. For example, the voluntary physical examination program is not conducted in compliance with DOE Order 5480.8 because insufficient staffing is available to schedule the examinations and process the results.

A similar finding was identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore (Concern MS.3-4).

Finding SF-MS-07 [Reference APR-MS-07]

Remote sites require additional medical facilities for emergencies. (MS.03)

Discussion

Additional facilities are necessary to support remote site coverage with respect to medical emergency response and for the handling of biological specimens (e.g., specimens collected for drug testing purposes). However, it will be necessary to evaluate remote sites requirements on a case-by-case basis.

This finding was not specifically identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore.

Finding SF-MS-08 [Reference APR-MS-03]

There is no formal mechanism for communicating to all affected employees full and timely information regarding the physical, chemical, and biological agents to which they may be exposed in the workplace. (MS.05)

Discussion

A formal, comprehensive program does not exist for identifying workplace hazards (see Finding SF-MS-02). In addition, a formal program does not exist (to ensure compliance with DOE Order 5480.8) for communicating the nature of workplace hazards to employees.

Because workplace hazards have not been identified, employees who work near or with physical, chemical, or biological hazards have not been adequately informed of medical surveillance requirements.

A similar finding was identified by the Tiger Team during its assessment of the medical services program area at SNL, Livermore (Concern MS-5.1).

4.4.20.3 Action Plan Requirements

APR-MS-01. Comprehensive fire protection assessments of Buildings 831 and T-13 to identify all potential fire hazards that may exist in those buildings need to be performed. This action plan should be coordinated with fire protection personnel in Directorate 7800.

APR-MS-02. A comprehensive assessment to identify the hazards present in the workplace at SNL needs to be performed. The results of this assessment should then be communicated to the Medical Directorate (3300) to permit their use in developing or revising the required medical surveillance programs.

APR-MS-03. A formal hazards communications program needs to be developed and implemented. This action plan should be coordinated with the Industrial Hygiene Division (3211).

APR-MS-04. The required medical services policies and procedures need to be developed and implemented to assure compliance with applicable OSHA requirements and DOE Order 5480.8; include requirements for periodic audits, appraisals, and self-assessments and describe the responsibilities, authorities, and interfaces of SNL medical services personnel.

APR-MS-05. A Quality management system needs to be developed and implemented for tracking the resolution of identified deficiencies in the medical services program area, as well as any deviations from prescribed practices. This system should be capable of incorporating document control functions, equipment maintenance and calibration schedules, and recordkeeping functions.

APR-MS-06. A plan needs to be develop to acquire the additional personnel necessary to support the various medical services programs and ensure compliance with DOE Order 5480.8.

APR-MS-07. The needs of each remote site should be evaluated with respect to proper medical services and support.

APR-MS-08. MOUs and other written agreements between SNL and outside agencies (e.g., hospitals, REECO, the Air Force, and the Navy) need to be developed and/or updated regarding medical services and support.

4.4.21 Firearms Safety

4.4.21.1 Overview

The self-assessment evaluated the firearms safety (FS) program area against the performance objectives in seven program elements: Organization and Administration (FS.01), Procedures and Documentation (FS.02), Firearms Safety Appraisal Program (FS.03), Firearms Safety Training (FS.04), Range

Operations and Procedures (FS.05), Force-on-Force Exercises (FS.06), and Transportation, Handling, and Storage of Munitions (FS.07).

All seven firearms safety performance objectives were evaluated through 15 FIS responses and through onsite observations, interviews, and meetings.

The firearms safety program at SNL, Albuquerque, is a formally documented program that has recently been updated. These procedures comply with DOE Order 5480.16. Responsibility for revision and control of the program document itself lies with the Safety Engineering Division (3215). The Emergency Management and Operations Training Division (3438) of the Safeguards and Security Services Department (3430) is responsible for development, revision, and administration of the procedures necessary to implement the program. These implementing procedures are reviewed and approved by the Firearms Safety Committee. At TTR, implementing procedure development, revision, and administration are the responsibility of the TTR Administrative Support Division (7516), and at SNL, Livermore, they are the responsibility of the Physical Security Division (8531).

The purpose of the firearms safety program is to establish the requirements for the safe use of firearms by SNL personnel and SNL subcontractor personnel involved in providing security for DOE assets. While consideration is given in this program to the right to use reasonable, necessary force in defense against violent and dangerous personal attack, the program is intended to promote weapons safety and prevent the indiscriminate use of firearms. The program provides requirements for the safe handling of weapons during firearms training and operations and addresses the safe transportation and storage of security munitions. This program applies to operations at the Albuquerque, Livermore, and TTR sites. Responsibility for the implementation and administration of a firearms safety program at KTF lies with the Navy.

Although the FS area was not specifically addressed by the SNL, Livermore, Tiger Team, aspects were addressed during the Tiger Team's appraisal of the security/safety interface program area.

4.4.21.2 Significant Findings

Finding SF-FS-01 [Reference APR-FS-01]

Although a Firearms Safety Committee has been established for TTR, it is not yet functional nor does it have ES&H representation in its membership. (FS.01, FS.03)

Discussion

This self-assessment identified that the Firearms Safety Committee at TTR, while formally established, was not performing its safety review and oversight functions. For example, the committee was not overseeing the firearms safety program of the security protective force contractor.

In addition, it was found that the Firearms Safety Committee lacked an ES&H representative, that is, a safety specialist who would be capable of analyzing any special situation that might arise involving the use of firearms. Although this program area was not specifically evaluated by the Tiger Team at SNL, Livermore, a similar finding was identified during the team's assessment of the security/safety interface program area (see Concern SS.4-1).

Finding SF-FS-02 [Reference APR-FS-02]

TTR has not performed a "risk analysis" for firearms handling and other related activities. (FS.04)

Discussion

An analysis of high-risk activities, such as loading, unloading, and exchanging weapons, has not been performed at TTR.

Finding SF-FS-03 [Reference APR-FS-03]

TTR facilities in support of firearms operations are inadequate to ensure compliance with DOE requirements. (FS.05)

Discussion

This self-assessment identified the lack of adequate lighting at the live-fire range at TTR. In addition, TTR lacks proper ammunition bunkers, training facilities, weapon cleaning facilities, and storage facilities.

Finding SF-FS-04 [Reference APR-FS-04]

The frequency of measurements of airborne lead concentrations at TTR does not comply with 29 CFR 1910.1025. (FS.05)

Discussion

Measurements of airborne lead concentrations at TTR are being taken semiannually rather than quarterly as required by OSHA Standard 29 CFR 1910.1025.

Finding SF-FS-05 [Reference APR-FS-05]

The firearms safety program documentation requires revision to reflect current ownership responsibilities for various aspects of the program. (FS.01)

Discussion

The existing firearms safety program document does not reflect the responsibility assignments previously described in the "Overview" section.

4.4.21.3 Action Plan Requirements

APR-FS-01. Actions must be initiated to ensure that the Firearms Safety Committee at TTR is functioning effectively, including identifying and assigning an ES&H representative to the committee.

APR-FS-02. A risk analysis needs to be prepared for firearms handling and other related activities at TTR.

APR-FS-03. Actions need to be initiated to ensure that the TTR facilities related to operation of firearms are either modified or constructed to achieve compliance with DOE requirements. These actions need to include associated funding requests.

APR-FS-04. Documentation needs to be reviewed and revised prescribing the intervals at which airborne concentrations of lead must be measured.

APR-FS-05. The existing firearms safety program document must be revised to reflect the current responsibility assignments.

4.4.22 Electrical Safety

4.4.22.1 Overview

The six program elements in the electrical safety (ES) program area include Administrative Controls (ES.01), Worker Qualification and Training (ES.02), Conduct of Electrical Work (ES.03), Safety Program Documentation (ES.04), Safety Equipment (ES.05), and Preventive Maintenance (ES.06).

DOE Order 6430.1A, 29 CFR 1910, 29 CFR 1926, NFPA 70 (National Electrical Code), ANSI C2 (National Electrical Safety Code), and NFPA 70B are all baseline documentation for this program area. All of these references are primarily concerned with building and utility electrical systems. NFPA 70B does have a few words about portable electrical tools. DOE Order 1324.2 is

used for records retention, and a generic reference to applicable ANSI and ASTM publications is made.

At SNL, Albuquerque, the building and utility electrical systems belong to the Facilities Directorate (7800). At TTR, the building and utility electrical systems are maintained by REECO, an onsite prime contractor to DOE (Directorate 7800 furnishes engineering and construction oversight on large projects). At KTF, a separate contractor to DOE furnishes maintenance on these systems, and DOE contracts for design and construction of major projects. Electrical work on nonbuilding electrical systems and equipment is the responsibility of the owning and operating line organization. Large energy equipment and systems, such as particle accelerators and pulsed power devices, radiant heat devices, induction heating devices, lasers, prime movers for pumps and compressors, solar collectors, photovoltaic systems, etc., as well as electrical lab equipment and setups, fall into this group. The current edition of the SNL ES&H Manual (SAND88-1161) has a few pages dedicated to laboratory electrical safety in the chapter on industrial safety.

Fifty-four FISs were returned and analyzed for this program area. Seventeen of these are from organizations responsible for building and utility electrical power; the other 37 are a sample from experimental and research activities. Follow-up action was taken on one of the pulsed power projects of the Repetitive Pulsed Power Research Division (1248), where an inspection of hardware and an interview with operating personnel were conducted. An interview was conducted with the division supervisor subsequent to the site visit. The instructor of a high-voltage class being used by the pulsed power organization to train electrical workers was interviewed. Also consulted was a division in the Metallurgy Department (1830) that represented a typical electrical laboratory area.

4.4.22.2 Significant Findings

Finding SF-ES-01 [Reference APR-ES-01]

The TSA program area on electrical safety, as written, is not a useful or effective ES&H criterion for laboratory or process operations.

Discussion

Of all the reference codes, standards, and orders, only 29 CFR 1910 has a general application for laboratory use, and its provisions are covered in the worker safety and health compliance (WS) program area. The requirements of the building and utility systems are covered by the maintenance program area. It is assumed that the fairly recent addition of ES to the TSA program was to

provide for electrical workers not involved with building systems some additional safety criteria besides those covered by OSHA Standard 29 CFR 1910. These objectives and criteria do not adequately meet the needs of our varied experimental and research activities. An alternative criterion should be provided for the special electrical equipment used in SNL projects. This equipment is not covered by criteria used in the nuclear power industry.

At SNL, Livermore, the Tiger Team did not specifically evaluate the ES program area.

4.4.22.3 Action Plan Requirements

APR-ES-01. The SNL safety engineering subprogram on electrical safety must include all the guidance required for light-lab-type operations (i.e., laboratories that use conventionally manufactured electrical equipment operating at normal service voltages). This program element must be supplemented with a generic SOP on light-lab electrical practices applicable to all SNL personnel; it must also be included in the new ES&H Manual. This SOP should be field checked by a group of line organizations.

The heavy-lab type of operations that involve electrical equipment and/or systems that operate at voltage or energy levels considered hazardous are in general not satisfactorily covered by conventional construction or industry codes or standards. These activities are not anticipated in any Institute of Nuclear Power Operations (INPO)-based DOE orders or guidelines, as there are no equivalent systems or equipment in the nuclear power industry (e.g., pulsed power equipment). This action plan would require Directorate 3200 to sponsor, develop, and own a program to define guidance in this area. As a minimum, representatives of the following activities should be consulted:

* radar
* resistance heating
* induction heating
* pulsed power equipment
* large capacitors
* photovoltaic
* electromagnetic
* pulse x-ray
* vertical axis wind turbine

The electrical program element should be reviewed by this group and checked for applicability and adequacy. The program should then be supplemented by additional implementation guidance as required to bridge to individual SOPs for each experiment or activity. This additional guidance should be sufficient to have a large degree of uniformity across SNL and the charter of this total effort aimed at other than building and utility systems. The permanent activities to maintain this effort might include a program like Pressure Safety Practices,

individual committees like the Pulsed Power Safety Committee, a separate committee for heavy-lab electrical safety, or a subset of a company-wide Electrical Safety Committee if the focus on nonbuilding and utility systems can be guaranteed for this particular need.

The electrical safety program needs to provide training for the technicians who wire control systems and other setups using conventional wiring and devices. This activity is covered by applicable codes, but the personnel doing the work do not usually have a design provided and frequently have no current training in wire sizing, fuse sizing, etc. Several days of training are required for each technician in what amounts to an apprentice course in code requirements. Organizations 1200, 1500, 2300, 2500, 6200, 7400, 8450, and 8011 need to be included as a minimum.

4.4.23 Worker Safety and Health Compliance (OSHA): Industrial

4.4.23.1 Overview

SNL is required to comply with the provisions of the Department of Labor (DOL) OSHA Standard 29 CFR 1910 pursuant to DOE Order 5483.1A. Article B-III of the contract for the operation of SNL requires Sandia Corporation to comply with all applicable OSHA standards adopted by DOE orders. DOE has performed a number of surveys for SNL compliance with DOE orders and OSHA regulations at Albuquerque, TTR, and KTF. Because of the depth and breadth of the requirements of 29 CFR 1910, Occupational Safety and Health Standards, this section will address compliance from the perspective of the 19 performance objectives WS.01 through WS.19, as specified in the TSA manual.

The Health and Safety Department (3210) has primary responsibility for providing SNL managers with worker safety requirements applicable to individual job activities and workplace conditions. It consists of five divisions: Industrial Hygiene/Toxicology Division (3211); Health Physics Division (3212); Health Instrumentation Division (3213); and two Safety Engineering Divisions (3215 and 3216). Each group provides information and staff support to line managers.

In addition, the Medical Directorate (3300) is responsible for caring for and documenting worker health at SNL. It has a Preventive Medicine Department (3330) and an Industrial Medicine Department (3340). It has developed and implemented programs for occupational medicine, emergency medicine, and preventive medicine. It and the Health and Safety Department are responsible

for a number of record systems covered by the Privacy Act (5 USC 552A). These medical record systems are: Personal Radiation Exposure Record; Occupational and Industrial Accident Records; and Personnel Assurance Program Records.

A total of 274 FIS were distributed to selected line organizations regarding performance objectives WS.01 through WS.19, which address compliance with industrial OSHA regulations, and 262 were returned and analyzed. Each FIS queried the compliance status as determined by the performance criteria and some were, therefore, both lengthy and detailed. For example, WS.19, relating to industrial toxic and hazardous substances, required response to 325 separate compliance questions. In many cases, replying to the questions on the FIS required the respondent to have access to and interpret 29 CFR 1910. Most respondents did not know the details of the regulations and indicated lack of compliance.

No field assessments were performed by the SAWG other than as informal training exercises by SAWG members in INPO material observation procedures during the week of October 1, 1990.

The SNL manager at TTR was interviewed by the SAWG regarding compliance at TTR.

4.4.23.2 Significant Findings

Finding SF-WS-01 [Reference APR-WS-01]

Although medical records are preserved and maintained by the Medical Director (3300) and radiation exposure records are preserved and maintained by the Health Instrumentation Division (3213) and the Industrial Hygiene Division (3211) for a period exceeding thirty years, a formal procedure for accommodating and documenting employee or designated representative access to the records is not in place. (WS.01)

Discussion

Procedures for tracking access to records are not well understood nor uniformly implemented. Medical and radiation exposure records are not maintained in a central location. Organizations currently maintaining records do not work cooperatively to create an appropriate, uniformly applicable, effective program. Development of the required documentation formalism has low priority. The procedures for implementing SNL policies with respect to the systems of records subject to the Privacy Act are set forth in SLI 4893, "Systems of Records Subject to the Privacy Act of 1974."

Deficiencies in the maintenance of radiation exposure records were also noted by the Tiger Team at SNL, Livermore (Concern RP.12-1).

The SNL, Livermore, Tiger Team also found that injury and illness recordkeeping and reporting were not performed in conformance with OSHA and DOE requirements (Concern MS.2-1; OSHA Conclusion 6).

Finding SF-WS-02 [Reference APR-WS-02]

Line supervisors are generally unaware of the requirements of 29 CFR 1910, Subpart D, relating to walking and working surfaces as implemented through DOE Order 5483.1A. (WS.02)

Finding SF-WS-03 [Reference APR-WS-02]

The SNL ES&H Manual (SAND88-1161), Chapter 4, Industrial Safety, does not provide definitive guidance with regard to the requirements of 29 CFR 1910, Subpart D, relating to walking and working surfaces. (WS.02)

Discussion

SNL, Albuquerque, does not meet the prescriptive standards of 29 CFR 1910, Subpart D, as related to marking aisleways and housekeeping. Although new construction and major renovations are accomplished in full compliance with the standards, remedial action to bring older facilities into full compliance is accomplished on a low-priority basis. Risks resulting from noncompliance are accepted as comparable to those in general public use.

Deficiencies with wooden ladders were also identified by the Tiger Team at SNL, Livermore, in its summary appraisal of walking and working surfaces (also see OSHA Conclusion 2). Although not resulting in a concern, blocked aisles and unmarked aisles were observed. Tripping hazards caused by cords and cables on the floor, indicative of poor housekeeping, were also reported.

Finding SF-WS-04 [Reference APR-WS-03]

Fire Prevention Plans maintained by the Fire Protection Division (7853) do not meet the performance criteria cited. (WS.03)

Finding SF-WS-05 [Reference APR-WS-03]

Egress is often blocked because of equipment overcrowding and inadequate housekeeping. (WS.03)

Finding SF-WS-06 [Reference APR-WS-03]

Exit corridors are intermittently obstructed and in most buildings are not constructed as one-hour fire-rated enclosures. (WS.03)

Finding SF-WS-07 [Reference APR-WS-03]

Compliance with TSA program element WS.03 is adversely impacted by the asbestos abatement processes at SNL, Albuquerque. (WS.03)

Discussion

The SNL Fire Prevention Plan requires significant revision to ensure that the performance objective is met. The lack of trained and experienced fire protection professional staff is the major contributing factor to the inadequacy of the program. Reconstruction of asbestos contaminated structures will be costly and slow (see Findings SF-FP-02, -03, and -04).

Multiple deficiencies in means of egress were observed by the Tiger Team at SNL, Livermore (Concern FP.2-1). The lack of a formal management policy and direction for the overall fire protection program as required by DOE Order 5480.7 was noted (Concern FP.1-1).

Finding SF-WS-08 [Reference APR-WS-04]

Although powered platforms, vehicle-mounted elevating and rotating platforms, and manlifts are used to support both plant engineering (Department 7810) and R&D activities, procedures for use, documentation, inspections, tests, maintenance, and cleaning cycles do not meet the performance objective and, hence, do not comply with the requirements of 29 CFR 1910, Subpart F, Industrial Powered Platforms and Manlifts. (WS.04)

Finding SF-WS-09 [Reference APR-WS-04]

Line R&D supervisors are generally not familiar with the requirements of 29 CFR 1910, Subpart F. (WS.04)

Discussion

Line R&D organizations believe that they are not responsible for inspections on manlifting equipment and lack the appropriate training to perform the function.

The Tiger Team at SNL, Livermore, did not comment on powered platforms and manlifts.

Finding SF-WS-10 [Reference APR-WS-05]

Line organizations are generally unaware of the requirements of 29 CFR 1910, Subpart G, particularly as they apply to confined space entry, local exhaust ventilation, and hearing protection. (WS.05)

Finding SF-WS-11 [Reference APR-WS-05]

The requirements for disposing of radioactive waste have not been adequately defined. (WS.05)

Finding SF-WS-12 [Reference APR-WS-05]

Safety showers and eye washes are not always properly located, drained, and tested. (WS.05)

Discussion

Line supervisors have used the SNL ES&H Manual (SAND88-1161) as the definitive source of ES&H policies, standards, and practices. The manual lacks the detailed coupling to 29 CFR 1910 that would enable supervisors to become familiar with the requirements.

Safety showers and eye washes are installed in laboratories as their need is identified. Since laboratories are moved from space to space in general purpose buildings, proper drains are impractical, and proximity of showers to electrical energy sources is inadequately controlled.

Programs that will provide requirements, education, and training need to be developed. Modification of facilities, as appropriate, will follow.

The Tiger Team at SNL, Livermore, reported deficiencies in the respiratory protection program (OSHA Conclusion 1; see Concern OSHA-1). The Tiger Team also found a room (Building 913, Room 118, Plating Lab) where strong acids and bases were used, but where an eyewash and safety shower were not provided.

The SNL, Livermore, OSHA compliance team found an eyewash station that was improperly located, so that a potential electrical hazard (electrocution) was caused by proximity of a powerline hookup to an electrical discharge machining (EDM) machine. The safety of the eyewash station was compromised by adjacent electrical sources.

Finding SF-WS-13 [Reference APR-WS-06]

Although some supervisors believe they comply with the requirements of the SNL ES&H Manual (SAND88-1161), the manual does not adequately cover the required OSHA standards. (WS.06)

Finding SF-WS-14 [Reference APR-WS-06]

Line organizations are unaware of the requirements of the hazardous material regulation 29 CFR 1910, Subpart H. (WS.06)

Finding SF-WS-15 [Reference APR-WS-06]

Inventories and recordkeeping are inconsistent. (WS.06)

Finding SF-WS-16 [Reference APR-WS-06]

Hazardous material handling procedures are insufficient, and the location, design, and labeling of storage facilities are inadequate. (WS.06)

Finding SF-WS-17 [Reference APR-WS-06]

Training for hazardous material and waste handling is inadequate. Improvements are required to ensure that hazardous materials and wastes are properly identified, contained, transported, and disposed. (WS.06)

Discussion

Programs need to be developed and implemented to instruct supervisors in the requirements of 29 CFR 1910, Subpart H. An inventory program that tracks chemicals from procurement through final disposition is required. Procedures for handling, storing, and using hazardous materials must be documented.

The SNL, Livermore, Tiger Team Concern OSHA-5 related in part to the identification and handling of hazardous materials at the Trudell site. The Tiger Team also cited deficiencies in Hazard Communication Training (Concern OSHA-6; see OSHA Conclusion 4).

Other concerns regarding the packaging and transportation of hazardous materials for onsite transfers were cited by the Tiger Team at SNL, Livermore. The handling and onsite transfers of hazardous materials did not meet the safety requirements of DOE Order 5480.1B (Concern PT.8-1). Storage of hazardous materials did not meet the safety and health requirements of DOE Order 5480.1B (Concern PT.8-2).

Finding SF-WS-18 [Reference APR-WS-07]

The line is unfamiliar with the requirements of 29 CFR 1910, Subpart I, regarding personal protective equipment. (WS.07)

Finding SF-WS-19 [Reference APR-WS-07]

Procedures for care and maintenance of personal protective equipment, such as safety glasses and respirators, are not in place in all areas and, where in place, are often improperly implemented. (WS.07)

Finding SF-WS-20 [Reference APR-WS-07]

The SNL policy on personal protective equipment, as stated in the ES&H Manual (SAND88-1161), Chapter 2, Section C, is followed by line supervision, instead of 29 CFR 1910, Subpart I. (WS.07)

Discussion

The SNL ES&H Manual (SAND88-1161) contains the SNL program for personal safety equipment. The program needs to be updated to ensure compliance with 29 CFR 1910, Subpart I. An unambiguous, definitive policy needs to be implemented regarding the procurement and use of safety shoes.

The Tiger Team at SNL, Livermore, also noted deficiencies in the Personal Protective Equipment programs, with regard to respirators (Concern OSHA-1) and gloves for chemical protection (Concern OSHA-4). At SNL, Livermore, respiratory protection program findings accounted for about 30 percent of all the serious findings (OSHA Conclusion 1).

The SNL, Livermore, Tiger Team also found that eye/face protection was not always used (e.g., when operating a Carver Lab press).

Finding SF-WS-21 [Reference APR-WS-08]

SNL does not have a policy on where food can be stored or consumed. (WS.08)

Finding SF-WS-22 [Reference APR-WS-08]

Rodents, insects, and other vermin enter SNL facilities. (WS.08)

Finding SF-WS-23 [Reference APR-WS-08]

Remote facilities are not adequately equipped with toilets and potable water. (WS.08)

Finding SF-WS-24 [Reference APR-WS-08]

Labeling of waterlines containing nonpotable water is inadequate. (WS.08)

Finding SF-WS-25 [Reference APR-WS-08]

Wild horses on TTR roam uncontrolled and pose a major hazard to vehicle traffic. (WS.08)

Discussion

Implementation of an eating and drinking policy is required to prevent ingestion of hazardous chemicals and other contaminants. SNL culture has tolerated casual eating and drinking in an informal atmosphere. Imposition of

regulations more restrictive than nonworkplace practice will adversely affect both morale and worker productivity.

Control of rodents and insects is performed by contract (see Section 3.4.4 of this report for additional information).

Management at TTR, including Colonel Charles L. Meyer, Director of the USAF/DOE Liaison Office, have notified the Bureau of Land Management about the hazards of wild horses at TTR by the letter dated May 9, 1989.

The Tiger Team assessment of SNL, Livermore, did not list concerns or conclusions regarding noncompliance with general environmental control regulations. However, the OSHA compliance team found that toilet facilities and washing facilities were not provided to employees working at the Trudell site as required by OSHA (page I-40). In addition, food was found to be improperly stored with flammable chemicals (page I-45), with copier chemicals (page I-66), and next to solvents (page I-97).

Finding SF-WS-26 [Reference APR-WS-09]

The line is unfamiliar with the requirements of 29 CFR 1910, Subpart K, relating to industrial medicine and first aid. (WS.09)

Finding SF-WS-27 [Reference APR-WS-09]

Some organizations lack adequate emergency eye/body wash facilities. (WS.05)

Finding SF-WS-28 [Reference APR-WS-09]

While the performance objective is generally met with regard to medical services and first aid, the mechanism of achievement is not adequately formalized and documented. (WS.09)

Discussion

The SNL, Albuquerque, Medical Director (3300) provides medical services and first aid during standard working hours. At other times, emergency services are provided by agreement with other city service organizations. These agreements must be formalized.

At TTR, REECO and the USAF collaborate to provide emergency medical services. A medical doctor in Tonopah also is available. These agreements must be formalized. At KTF, medical services are provided by the US Navy and local hospitals through Interagency Support Agreement No. 534A-87274-028.

Emergency eye/body wash facilities are not always available at either SNL, Albuquerque, or Livermore (see Finding SF-WS-12 and SNL, Livermore, Tiger Team assessment report, page I-81). Other aspects of Medical First Aid Regulations were not discussed in the SNL, Livermore, Tiger Team report.

Finding SF-WS-29 [Reference APR-WS-10]

The existing fire protection program at SNL, Albuquerque, is not in compliance with 29 CFR 1910, Subpart L. (WS.10)

Finding SF-WS-30 [Reference APR-WS-10]

Inspection of fire extinguishers does not meet OSHA frequency requirements. (WS.10)

Finding SF-WS-31 [Reference APR-WS-10]

Training of employees regarding the use of fire extinguishers is inadequate. (WS.10)

Discussion

The fire protection staff in Division 7853 is extremely inadequate. A program needs to be created and implemented to assure compliance with DOE Orders 5480.7 and 6430.1A, and the requirements of 29 CFR 1910, Subpart L (see Section 4.4.18, Fire Protection).

The line supervisors are unaware of the requirements of 29 CFR 1910, Subpart L. However, SNL has negotiated an agreement with DOE/AL regarding variances from the OSHA criteria, and these exceptions are not generally known. Lack of compliance is, therefore, presumed by the line when they compare the status quo to 29 CFR 1910, Subpart L.

Training on selection of fire extinguishers and use of extinguishers on fires fed by various fuels was provided to all employees via videotape. Many employees thought that hands-on training would have been more useful.

The OSHA compliance assessment (Section 5.0) of the SNL, Livermore, Tiger Team report did not list fire protection deficiencies as a concern. However, Appendix I of the report lists numerous examples of missing exit signage, noncompliant signage, blocked egress, noncompliant fire extinguishers, and improperly stored fuels that indicate the inadequacy of the SNL, Livermore, fire protection program.

Several concerns cited in the fire protection program area by the Tiger Team at SNL, Livermore, apply to SNL, Albuquerque. Formal management policy and direction for the overall fire protection program does not exist as required by DOE Order 5480.7 (Concern FP.1-1). NFPA 101, "Life Safety Code," is not

followed throughout the site (Concern FP-2.1). Fire protection systems and equipment are not inspected, tested, and maintained in accordance with NFPA standard, and DOE Order 5480.7 (Concern FP.7-1).

Finding SF-WS-32 [Reference APR-WS-11]

SNL has a standing Pressure Safety Advisory Committee, tasked to provide policies for pressure safety (see SLI 1030, "Official Sandia Laboratories Committees"). All SNL organizations are directed to meet or exceed the criteria of the policy, as given in the Pressure Safety Practices Manual (SAND87-1003); however, not all organizations are in compliance with the stated policy. (WS.11)

Finding SF-WS-33 [Reference APR-WS-11]

Although the Pressure Safety Practices Manual meets or exceeds the requirements of the ASME Boiler and Pressure Vessel Code, ANSI/ASME, American Vacuum Society (AVS), and American Welding Society (AWS) specifications, it has not been directly reviewed with regard to the content of 29 CFR 1910, Subpart M. (WS.11)

Finding SF-WS-34 [Reference APR-WS-11]

Maintenance of pressure systems is inconsistent and does not meet the requirements of the Pressure Safety Practices Manual. (WS.11)

Finding SF-WS-35 [Reference APR-WS-11]

Documentation of design, test, and periodic inspection of pressure systems and pressure relief devices is inconsistent. (WS.11)

Discussion

The SNL Pressure Safety Advisory Committee has prepared a Pressure Safety Practices Manual intended to supplement existing consensus codes (e.g., the ASME Boiler and Pressure Vessel Code) because the codes lag modern technology as practiced at SNL. For example, the codes, as influenced by economics, tolerate the use of construction materials considered unsafe at SNL.

As a result of rigorous incoming inspection, many air receiver pressure vessels containing ASME code stamps were rejected. A Government Industry Data Exchange Program (GIDEP) alert was issued.

This enhanced pressure policy is intended to cover not only routine, low-pressure systems such as house air, but also the R&D systems that operate at much higher pressures, where existing codes do not apply.

No concerns regarding the handling and use of compressed gases or pressure safety resulted from the Tiger Team assessment at SNL, Livermore. The OSHA team did find noncompliant signage at a hydrogen storage site (pages I-44 and I-90), hydrogen and methane gas cylinders stored in an unventilated and unbonded room (page I-89), and noncompliances regarding location of oxygen and acetylene tanks (pages I-110, I-111, and I-114).

Finding SF-WS-36 [Reference APR-WS-12]

Line organizations are not aware of the requirements of 29 CFR 1910, Subpart N, as they apply to materials handling and storage. (WS.12)

Finding SF-WS-37 [Reference APR-WS-12]

Although many SNL organizations use overhead cranes, inspection, maintenance, signage, testing, documentation, operator training, and sling testing and tagging requirements are often ignored. (WS.12)

Finding SF-WS-38 [Reference APR-WS-12]

Some chemical storage cabinets are improperly located with regard to the Fire Protection Program. (WS.12)

Finding SF-WS-39 [Reference APR-WS-12]

Handling apparatus, including cranes and forklifts, can be used by unauthorized operators because of the lack of key switches or operator failure to secure keys or shut down vehicles. (WS.12)

Discussion

Line supervisors have used the SNL ES&H Manual (SAND88-1161), Chapter F (Forklifts and Trucks), and Chapter G (Cranes, Hoists, and Rigging). Page 4-45 of that document contains a table that cross-references the material handling/storage requirements for specific items identified in the ES&H Manual (e.g., contaminated clothing, heavy loads, gas cylinders, ladders, flammables, etc.). The relationships between the recommendations in the ES&H Manual and the requirements of 29 CFR 1910, Subpart N, are not known.

An imminent danger situation was observed by the OSHA compliance team at SNL, Livermore, in the Building 963 (Tool Crib) materials/parts storage area. The situation involved an unattended forklift that held a 500-pound motor 4 1/2 feet above the floor.

In addition, Concern OSHA-7 cited that more frequent safety inspections of warehouse material handling practices would reduce instances of unstable storage. An uninspected crane was also cited by the OSHA compliance team at SNL, Livermore (page I-145).

Finding SF-WS-40 [Reference APR-WS-13]

Line organizations are not aware of the requirements of 29 CFR 1910, Subpart N, relating to machinery and machine guarding. (WS.13)

Finding SF-WS-41 [Reference APR-WS-13]

Some machinery lacks required guarding. (WS.13)

Discussion

Line supervisors are generally unaware of the requirements of 29 CFR 1910, Subpart N, relating to machine guarding. The SNL ES&H Manual (SAND88-1161) does not discuss the issue at all. Some supervisors believe that their machine guarding is adequate and appropriate in spite of ignorance of the requirements.

No concerns about noncompliance with the regulations regarding machinery and machine guarding were cited by the SNL, Livermore, Tiger Team. However, the OSHA compliance team did discuss the observations that the Enerpac 30-ton press did not have shielding for workers using it and others in the area or passing by, that a pedestal grinder in the welding shop had an improperly placed work rest, that the Verson power press did not have a guard in place to prevent an operator from extending his hand into the machine while operating the controls and handling material, and that the KR Wilson 100-ton press did not have shielding for operators or passers-by.

Finding SF-WS-42 [Reference APR-WS-14]

Line organizations are not aware of the requirements of 29 CFR 1910, Subpart N, relating to industrial hand and power tools. (WS.14)

Finding SF-WS-43 [Reference APR-WS-14]

The SNL ES&H Manual (SAND88-1161) does not directly address the utilization of hand and power tools. (WS.14)

Finding SF-WS-44 [Reference APR-WS-14]

Inspection and maintenance of power cords and plugs are inconsistent. (WS.14)

Finding SF-WS-45 [Reference APR-WS-14]

Employee training on the use of hand and portable powered tools is inadequate. (WS.14)

Finding SF-WS-46 [Reference APR-WS-14]

Employees are not held accountable for the "safe" condition of their tools. (WS.14)

Discussion

Supervisors are generally unaware of the requirements of 29 CFR 1910, Subpart N. Hand tools are used casually. However, chip-dusting nozzles using compressed air are regularly checked by safety inspections.

No concerns about noncompliance with the regulations regarding industrial hand and power tools were cited by the SNL, Livermore, Tiger Team. However, the OSHA compliance team noted a wood chisel with a gouged and defective blade, a chipped hand tool, four chipped chisels and a cracked hammer handle, and a splintered hammer handle.

Finding SF-WS-47 [Reference APR-WS-15]

The line is not aware of the requirements of 29 CFR 1910, Subpart Q, relating to welding, cutting, and brazing. (WS.15)

Finding SF-WS-48 [Reference APR-WS-15]

The subject of welding safety is covered in the SNL ES&H Manual (SAND88-1161), Chapter 4, Section D, which does not incorporate all of the requirements of 29 CFR 1910, Subpart Q. (WS.15)

Finding SF-WS-49 [Reference APR-WS-15]

No program for apparatus maintenance exists (see Finding SF-MA-01). (WS.15)

Finding SF-WS-50 [Reference APR-WS-15]

Training of operators is highly variable (see Finding SF-TC-01). (WS.15)

Discussion

Welding, cutting, and brazing operations are performed not only by tradesmen, wherein the processes constitute their major assignment and where they receive extensive on-the-job training, but also by others on an incidental basis. Training of casual users and equipment maintenance are informal and inadequate. Ventilation and confined space requirements are generally not recognized by incidental users.

No concerns about noncompliance with the regulations regarding welding, cutting, and brazing were cited by the SNL, Livermore, Tiger Team. However, improper storage and handling of oxygen and acetylene bottles was noted, and welding apparatus cables were observed obstructing aisleways.

Finding SF-WS-51 [Reference APR-WS-16]

The line organizations are not familiar with the requirements of 29 CFR 1910, Subpart S, relating to electrical equipment and installation requirements. (WS.17)

Finding SF-WS-52 [Reference APR-WS-16]

Some older facility installations are not in full compliance, but they do comply with codes, standards, and regulations in effect at the time of construction. (WS.17)

Finding SF-WS-53 [Reference APR-WS-16]

Power disconnects are not clearly marked for all equipment. (WS.17)

Discussion

As building codes evolve, new construction and major renovations comply with current codes. Retrofit of facilities as codes evolve generally is not done. The SNL ES&H Manual (SAND88-1161), Chapter 4, Section B, provides policy regarding electrical safety practices and refers specifically to laboratory equipment and plant electrical equipment. The manual does not reference 29 CFR 1910, Subpart S; therefore, line organizations following that manual may believe they are in compliance, not knowing the deficiency of the manual.

The OSHA compliance inspection at SNL, Livermore, performed by OCCUSAFE, Inc., cited numerous noncompliances in the area of industrial electrical regulations. Concern OSHA-3 stated that "a general lack of safety awareness was apparent. Numerous electrical hazards were identified throughout the site. In addition, a number of old panel boxes had missing screws, plates, and holes. The electrical safety inspection program should be improved to reduce electrical hazard potential including identifying the electrical panel boxes requiring repair or replacement."

In addition to the previously mentioned noncompliances, the following findings were also common in the SNL, Albuquerque, self-assessment:

* temporary wiring
* circuit labeling/signage
* clearance of electrical boxes/consoles
* defective insulation
* use of flexible cables
* labeling of breakers and disconnects
* proximity to water sources

Finding SF-WS-54 [Reference APR-WS-17]

Diving operations are performed by several SNL organizations (1260, 7530, 9340). All indicate compliance with the performance objectives. (WS.18)

Finding SF-WS-55 [Reference APR-WS-17]

No formal program exists to ensure continued compliance with the requirements of 29 CFR 1910, Subpart T, relating to diving operations. (WS.18)

Discussion

Because SNL supervisors are unaware of the requirements of 29 CFR 1910, Subpart T, their compliance with all requirements of the regulations is inconsistent.

The commercial diving operations program element did not apply to SNL, Livermore.

Finding SF-WS-56 [Reference APR-WS-18]

The line organizations are not familiar with the requirements of 29 CFR 1910, Subpart Z, as they relate to toxic and hazardous substances. (WS.19)

Finding SF-WS-57 [Reference APR-WS-18]

Supervisors do not know if 29 CFR 1910.1450 applies to their laboratory use of hazardous chemicals. (WS.19)

Finding SF-WS-58 [Reference APR-WS-18]

Some of the hazardous materials cited in 29 CFR 1910, Subpart Z (e.g., benzene, formaldehyde, arsenic, lead, asbestos), are used at SNL in a noncompliant manner. (WS.19)

Discussion

Although significant effort has been expended at SNL in asbestos abatement, only a fledgling program exists. Hazardous materials at SNL are handled through SOPs, which are prepared by line organizations and reviewed by the Health Physics and Industrial Hygiene Divisions (3212 and 3111). Supervisors are guided by the SNL ES&H Manual (SAND88-1161), Chapter 6, Section B (Control of Hazardous Chemicals) and Section G (Hazard Communications). Section B does not reference 29 CFR 1910, Subpart Z, requirements.

The SNL, Livermore, Tiger Team report did not discuss OSHA noncompliance with regard to the specific elements and compounds specified in 29 CFR 1910, Subpart Z. However, compliance in this area is critically dependent upon an

excellent HazCom program, and the need for that program was discussed in Concern OSHA-6.

4.4.23.3 Action Plan Requirements

APR-WS-01. A program needs to be developed by Division 3211, Industrial Hygiene, concerning recordkeeping and reporting requirements, to address the chemical exposure part of the required performance objectives.

Additional programs need to be developed by Department 3340 regarding Occupational Medicine: OSHA Medical Reporting and Recordkeeping Requirements for Work-Related Incidents, for Work-Related Illness, and for Medical Records Management. A program that implements SLI 4893 in a uniform manner needs to be developed by Division 3212 regarding radiation exposure records.

APR-WS-02. A program needs to be developed by Division 3215 to meet the performance objective related to walking and working surfaces.

APR-WS-03. A program needs to be developed by the Fire Protection Division (7853) to meet the requirements of this performance objective, as defined by DOE Orders 5480.7 and 6430.1A (see APR-FP-01).

APR-WS-04. A program to ensure compliance with the requirements of 29 CFR 1910, Subpart F, needs to be prepared by Organization 3215, or prepared by Department 7810 and approved by Division 3215, regarding powered platforms and manlifts.

APR-WS-05. An updated version of the ES&H Manual (SAND88-1161) that provides guidelines sufficient to enable line supervisors to meet OSHA requirements needs to be published by Directorate 3200.

Specific programs need to be prepared and implemented to ensure OSHA compliance in the following areas:

* Industrial Hygiene (DOE Order 5480.10) by Division 3211

  - Confined space entry
  - Local exhaust ventilation
  - Laser safety
  - Hearing conservation
  - Laboratory standards
  - Chemical hazard identification
  - Chemical hazard communication
  - Respiratory protection
  - Chemical inventory
  - Emergency showers and eyewashes
  - Nonionizing radiation

* Environmental Protection and Waste Management (DOE Orders 5400.1, .3, and .4; 5440.10, 5480.4, and 5482.2A) by Division 3222

  - Radioactive and mixed waste

APR-WS-06. The following programs need to be developed and implemented:

* Safety Engineering (DOE Orders 5480.4, 5483.1A, and 5484.1) by Division 3215

  - Explosives
  - Materials handling and storage
  - Pressure

* Industrial Hygiene (DOE Order 5480.1) by Division 3211

  - Laboratory standards
  - Chemical hazard identification
  - Chemical hazard communication
  - Respiratory protection
  - Field instrumentation
  - Chemical inventory
  - Chemical carcinogen control
  - Chemical protective clothing

APR-WS-07. Specific programs need to be prepared and implemented to ensure OSHA compliance in the following areas:

* Safety Engineering by Division 3215

  - Personal Protective Equipment

* Industrial Hygiene by Division 3211

  - Confined space entry
  - Laser safety
  - Hearing conservation
  - Asbestos -- worker protection
  - Respiratory protection
  - Emergency showers and eyewashes
  - Chemical protective clothing

APR-WS-08. Specific programs need to be prepared and implemented to ensure OSHA compliance in the following areas:

* Safety Engineering by Division 3215

  - Vehicle and traffic safety
  - Remote and field safety

* Industrial Hygiene by Division 3211

  - Potable water
  - Pest control
  - Industrial hygiene remote sites
  - Sanitation (food)

APR-WS-09. The SNL Medical Director, 3300, needs to negotiate and document an agreement with all providers of supplemental emergency medical assistance. In addition, a program for medical emergency preparedness needs to be prepared and implemented. This program needs to be integrated with the emergency preparedness plan and procedures meeting the requirements of DOE Orders 5500.1A, .2A, .3A, .4, .7A, .8, and .9.

APR-WS-10. A comprehensive fire protection program needs to be developed and implemented. (see also APR-FP-01).

A staffing plan must be created and implemented by vigorous recruiting or contract personnel in order to assure timely implementation of the fire protection program.

APR-WS-11. A pressure safety program needs to be developed and implemented by Division 3215. This program needs to assure integration of the requirements of 29 CFR 1910, Subpart M, into the Pressure Safety Practices Manual (SAND87-1003).

APR-WS-12. A safety engineering materials handling and storage program needs to be developed and implemented by Division 3215 to ensure that all materials handling and storage activities comply with the requirements of 29 CFR 1910, Subpart N.

APR-WS-13. A safety engineering machinery and machine guarding program needs to be identified and implemented by Division 3215 to ensure compliance with the requirements of 29 CFR 1910, Subpart N.

APR-WS-14. The SNL ES&H Manual (SAND88-1161) needs to be revised to include sections on hand and power tools sufficiently definitive to assure compliance with the requirements of 29 CFR 1910, Subpart N. A program on machinery and power tool safety needs to be developed and implemented by Division 3215.

APR-WS-15. The SNL ES&H Manual (SAND88-1161) needs to be revised so that the information presented in Chapter 4, Section D, on welding safety will ensure compliance with the requirements of 29 CFR 1910, Subpart Q.

APR-WS-16. A safety engineering-electrical program needs to be developed and implemented to ensure SNL compliance with the requirements of 29 CFR 1910, Subpart S.

APR-WS-17. Division 3215 needs to develop and implement a diving safety compliance program.

APR-WS-18. Programs need to be developed and implemented by Division 3211 in order to enable and ensure compliance with the requirements of 29 CFR 1910, Subpart Z, relating to toxic and hazardous substances. These should include:

* Recordkeeping and reporting requirements
* Confined space entry
* Local exhaust ventilation
* Laboratory standard
* Asbestos (corporate)
* Asbestos (worker protection)
* Chemical hazard identification
* Chemical hazard communication
* Respiratory protection
* Industrial hygiene evaluation, pregnant women workplaces
* Indoor air quality
* Field instrumentation
* Industrial hygiene chemical laboratory
* Chemical inventory
* Chemical carcinogen control
* Bioassay
* Industrial hygiene training

APR-WS-(1-18)A. APR-WS-1 through APR-WS-18 need to formally address the application of the programs described therein to onsite visitors and nonconstruction contractors in a uniform and consistent manner (see also APR-PR-02).

4.4.24 Worker Safety and Health Compliance (OSHA): Construction

4.4.24.1 Overview

Most construction work performed at SNL facilities in Albuquerque is performed by contractors to SNL. Some limited construction activity, mostly in the area of maintenance and minor interior building renovations, is performed by the Facilities Operations and Maintenance Department (7810). Construction work is further subdivided between those requiring budgetary line item delegation in the Department of Energy Appropriations Act and projects having a lesser dollar value. SNL first received authorization to contract for line item construction projects at its facilities from DOE in fiscal year 1989. To date, construction has begun on one line item project at SNL facilities. None has been completed. Before FY 1989, oversight of construction standards for line item projects at Albuquerque, TTR, and KTF was provided directly by USDOE.

The Purchasing Division (3722) is responsible for construction contract preparation, negotiation, and administration. The Facilities Construction and Environmental Engineering Department (7850) is responsible for the management and inspection of construction activities at Albuquerque and TTR.

All SNL contracts for construction on its premises contain a Article A67, which requires the contractor to:

> "take all reasonable precaution in the performance of the work ... to protect the environment and the property, safety, and health of contractors, SNL and DOE employees, visitors to SNL and members of the public, and shall comply with all applicable environmental, safety, and health laws, rules, and regulation, as amended, of the Federal, State, and local governments, DOE, and SNL. These rules and regulation include, but are not limited to, the (i) Clean Air Act; (ii) Clean Water Act; (iii) Resource Conservation and Recovery Act; (iv) Comprehensive Environmental Response, Compensation, and Liability Act; (v) Hazardous and Solid Waste Act; (vi) Toxic Substance Control Act; (vii) Emergency Planning and Community Right to Know Act; (viii) Federal Insecticide, Fungicide, and Rodenticide Act; (ix) Safe Drinking Water Act; (x) Occupational Safety and Health Act; (xi) Hazardous Material Transportation Act; (xii) Hazard Communication Standard and Superfund Re-Authorization Act; (xiii) DOE Orders 1540.1, 4300.1B, 5000.3, 5440.1A, 5480.4, 5482.1B, 5483.1A, 5484.1, 5820.2, and 5480.1B, as amended; and (xiv) the Manual of Accident Prevention in Construction published by the Associated General Contractors of America, Inc., in effect on the effective date of this contract ... Article A67(a)(1)."

In addition, Article A67 requires a safety plan and specific contractor obligations for reporting, providing a safety officer on site, hazard identification, use of explosives, excavation near street lighting cable, fire protection (including welding, cutting, and hot work), operation of gasoline-powered equipment inside buildings, and additional safety and material control requirements.

At TTR, REECO, under a separate prime contract with DOE, provides major construction services at SNL facilities. SNL requests for construction services are provided to DOE for review and execution by REECO without any further direct involvement. Some minor construction and renovation is contracted directly by SNL, however, this work is relatively insignificant. When it occurs, it follows the construction procedures and practices described for Albuquerque.

Construction contracts for work at KTF are normally awarded and administered by Raytheon Service Nevada (RSN), under the auspices of the USDOE, Pacific Area Support Office (PASO) of the Nevada Operations (NVO). The

USDOE/PASO has also managed construction projects sponsored by the Strategic Defense Initiative Office/Strategic Defense Command (SDIO/SDC) and funded by Military Construction (MILCON) budget. Minor modifications and maintenance are performed by the USDOE/PASO contractor (RSN) and KTF.

The SNL Purchasing Division (3722), in association with the Facilities Construction and Environmental Engineering Department (7850), has contracted with an expert engineering firm to provide day-to-day construction inspection services at construction sites in Albuquerque and Tonopah. The present contractor for this service is Holmes and Narver.

A total of 68 FISs were distributed to assess compliance in the area of general construction safety and health (OSHA) compliance, with 67 FISs returned and analyzed. It was determined that well-established procedures and interfaces existed between the Facilities Construction and Environmental Engineering Department (7850), the Construction and A/E Purchasing Division (3722), and the Health and Safety Department (3210) regarding construction regulatory compliance. The SAWG members interviewed management and staff from each of those organizations to clarify the action plan requirements identified herein.

4.4.24.2 Significant Findings

Finding SF-WS-59 [Reference APR-WS-19]

Construction contractor employees do not comply with the requirements of 29 CFR 1926, Subpart C, as they apply to general construction safety and health. (WS.20)

Finding SF-WS-60 [Reference APR-WS-19]

Construction contractor employees have not received adequate, documented, or appropriate training and do not understand OSHA requirements. (WS.20)

Finding SF-WS-61 [Reference APR-WS-19]

SNL construction contracts include general requirements, such as "compliance with OSHA," but do not contain detail to assist the contractor in all areas expected to be encountered for specific projects. (WS.20)

Finding SF-WS-62 [Reference APR-WS-19]

SNL oversight of contractors and enforcement of requirements are not performed in a consistent manner by knowledgeable SNL personnel and/or construction inspection contractors. (WS.20)

Discussion

SNL has in place a procedure for the management of the SNL, Albuquerque, construction safety program, approved by the Manager of the Facilities Construction and Environmental Engineering Department (7850) and the Manager of the Health and Safety Department (3210). The supervisor of the Construction Services Division (7852) serves as the manager of the safety program for all subcontracted construction projects. Requirements for conforming to applicable safety and health regulations are included in the subcontracts. The Construction and Architectural/Engineering (A/E) Purchasing Division (3722) delegates authority for the day-to-day management of the contractual requirements to Division 7852. The manager of the program ensures that:

* The contractors submit documentation of their safety program for review and comment by SNL.

* The staff holds formal and/or informal preconstruction safety orientation meetings with contractor personnel.

* The Division Inspector/Observer (I/O) staff personnel make periodic onsite assessments of the contractor's compliance with safety and health requirements, and they document the findings. The I/O staff is composed of five SNL employees and 17 Holmes and Narver contract employees.

* The section supervisors and I/O staff are provided training. The training consists of a 40-hour classroom presentation provided by the Safety Engineering Division (3215), and bimonthly division safety meetings on associated topics, usually presented by the division supervisor.

* The section supervisors perform periodic assessment of the effectiveness of the I/O staff.

* Periodic assessments of the management of the construction safety program are made by the Safety Engineering Division (3215).

In spite of the programs and procedures in place to ensure OSHA compliance by contractors, the SNL inspectors/observers find that nonconformances to the regulations of 29 CFR 1926 occur. In addition, contractors and their employees do not always comply with the regulations contained in 29 CFR 1910.

At SNL, Livermore, an imminent danger situation was observed by the OCCUSAFE, Inc., inspection team at the Trudell site, where a contractor was excavating and removing hazardous waste, resulting in Concern OSHA-5. This situation resulted in serious findings that indicated the contractor did not meet OSHA excavation requirements, did not monitor exposure of employees to

hazardous materials, did not formally alter the plan as requirements for excavation changed, and did not document site worker training. The initial site safety and health plan did not properly address excavation safety training and medical surveillance. Deficiencies of these kinds can be anticipated at other sites because of Findings SF-WS-59 through SF-WS-62 at SNL, Albuquerque.

Finding SF-WS-63 [Reference APR-WS-20]

Identification of potable and nonpotable water at construction sites is not in compliance with the requirements of 29 CFR 1926.51. (WS.21)

Finding SF-WS-64 [Reference APR-WS-20]

Permissible noise exposure levels are not adequately controlled at construction sites as required in 29 CFR 1926.52. (WS.21)

Finding SF-WS-65 [Reference APR-WS-20]

Ventilation systems at construction sites do not comply with the requirements of 29 CFR 1926.57. (WS.21)

Finding SF-WS-66 [Reference APR-WS-20]

The HazCom program required by 29 CFR 1926.59 is sporadically implemented at construction sites. (WS.21)

Discussion

Department 7850 believes that only about 10 percent of the contractors to SNL have employees who are adequately trained with regard to the requirements of 29 CFR 1926, Subpart D. The findings above reflect the contractors' lack of awareness. When SNL construction inspectors find noncompliances, they begin a training process that is not otherwise available to local, small business and disadvantaged contractors. Department 7850 generally perceives that rapid contractor employee turnover exacerbates the lack of training, as does the cost of training that contractors must absorb while remaining competitive bidders.

The failure of the Purchasing Division to communicate requirements to contractors and then not uniformly enforce them during contract administration requires some prospective contractors to overlook stringent compliance programs in order to remain competitive.

Although the OCCUSAFE, Inc., OSHA compliance inspectors cited no concerns in the construction environmental area at SNL, Livermore, they did note that there did not appear to be an intensive contractor safety inspection program with routine feedback to contractors. The action plan should address this deficiency.

Finding SF-WS-67 [Reference APR-WS-21]

Personal protective equipment and life saving equipment, as required in 29 CFR 1926, Subpart E, are not always used. (WS.23)

Finding SF-WS-68 [Reference APR-WS-21]

Respirators, safety belts, and life lines are not maintained as required in 29 CFR 1926, Subpart E. (WS.23)

Finding SF-WS-69 [Reference APR-WS-21]

Contractor management and employees are not familiar with the requirements of 29 CFR 1926, Subpart E. (WS.23)

Discussion

Hard hats and eye protection are generally used. Construction employees sometimes use safety belts improperly. Many contractors are unfamiliar with 29 CFR 1926, Subpart E, requirements.

No noncompliances were cited by the SNL, Livermore, Tiger Team in the use and maintenance of contractors' respirators, safety belts, and life lines as required in 29 CFR 1926, Subpart E.

Finding SF-WS-70 [Reference APR-WS-22]

A construction fire protection program is in place that ensures compliance with the requirements of 29 CFR 1926, Subpart F. (WS.24)

Discussion

Department 7850 believes that because a construction fire protection program is in place, the performance objective is met.

Several noncompliances were noted by the OSHA compliance inspectors at SNL, Livermore, with regard to contractors' fire extinguishers. Those deficiencies suggest lack of understanding of requirements or disregard for regulations and lack of oversight/inspection. The same circumstances probably exist at SNL, Albuquerque, to some degree, indicating that increased contractor education and oversight by SNL will be required.

Finding SF-WS-71 [Reference APR-WS-23]

Signs, signals, and barricades are currently used on construction sites to identify hazards, potential hazards, and dangerous areas on the project and in work areas; however, no system is in place to ensure that signs, signals, and barricades meet the requirements defined in 29 CFR 1926, Subpart G. (WS.25)

Finding SF-WS-72 [Reference APR-WS-23]

Incorporation of the regulatory requirements of 29 CFR 1926, Subpart G, into contracts for construction is done by reference only. (WS.25)

Finding SF-WS-73 [Reference APR-WS-23]

Contractors are generally unaware of the requirements of 29 CFR 1926, Subpart G. (WS.25)

Discussion

Contractors are unaware of the requirements of 29 CFR 1926, Subpart G, regarding construction signs, signals, and barricades, and there is no procedure for educating them regarding the requirements. Construction inspectors provide the training on the job by identifying deficiencies. Contracts require compliance "with OSHA requirements," but do not specify or detail what requires compliance.

No noncompliances in the construction signs, signals, and barricades area were cited by the OSHA compliance inspectors at the SNL, Livermore, construction sites.

Finding SF-WS-74 [Reference APR-WS-24]

Contractors and their employees lack the experience, knowledge, and training required to ensure compliance with the requirements of 29 CFR 1926, Subpart H, particularly in regard to load handling compliance tables. (WS.26)

Finding SF-WS-75 [Reference APR-WS-24]

SNL construction inspectors' overview of contractors regarding compliance with the requirements of 29 CFR 1926, Subpart H, is not continuous, but is done on a sampling basis. (WS.26)

Discussion

Most requirements for storage, use, and disposal of materials have been met. These activities tend to be long term, or "static," and are more amenable to oversight than are the material handling activities, which are by their very nature transitory, or dynamic. Expedience and the urge to get the job done may contribute to violation of load handling compliance rules. It is possible that inspectors tolerate noncompliance to facilitate the job.

No noncompliances in the materials handling area were cited by the OSHA compliance inspectors at the SNL, Livermore, construction sites.

Finding SF-WS-76 [Reference APR-WS-25]

SNL construction inspectors have observed contractor noncompliance with the requirements of 29 CFR 1926, Subpart I, Hand and Power Tools. The largest number of noncompliance findings deal with guards on power tools, condition of hand tools, compressed air tools, power actuated tools, and jack requirements. (WS.27)

Discussion

The very large number of noncompliances discussed by the self-assessment team in Department 7850 suggests that contractors' noncompliance is more serious than a few slip-ups. Contractors either do not understand the implications of accepting a contract with SNL (which states they must comply with OSHA), do not understand the requirements, or elect not to meet the requirements.

No noncompliances in the area of construction hand and power tools were cited by the OSHA compliance inspectors at the SNL, Livermore, construction sites.

Finding SF-WS-77 [Reference APR-WS-26]

Contractor employees do not always use gas welding and cutting equipment that complies with the requirements of 29 CFR 1926, Subpart J. (WS.28)

Finding SF-WS-78 [Reference APR-WS-26]

Training of contractor employees who are principally welders, and of employees who perform welding and cutting operations incidentally, is inconsistent. (WS.28)

Discussion

Many of the performance criteria regarding gas welding operators and equipment, arc welding operators and equipment, personal protective apparatus, heating coated materials, and ventilation are out of compliance with the requirements of 29 CFR 1926, Subpart J.

The very large number of noncompliances discussed by the self-assessment team in Department 7850 suggests that contractors' noncompliance is more serious than a few slip-ups. Contractors either do not understand the implications of accepting a contract with SNL (which states they must comply with OSHA), do not understand the requirements, or elect not to meet the requirements.

There were no noncompliances in the area of construction welding and cutting cited by the OSHA inspectors at the SNL, Livermore, construction sites.

Finding SF-WS-79 [Reference APR-WS-27]

Labeling of electrical equipment and power disconnects does not comply with the requirements of 29 CFR 1926, Subpart K, Electrical. (WS.29)

Finding SF-WS-80 [Reference APR-WS-27]

Inspection of electrical work is not complete. Some projects are incorrect, incomplete, and not documented. (WS.29)

Finding SF-WS-81 [Reference APR-WS-27]

Work practices, including lockout and tagout practices, are not in compliance with 29 CFR 1926, Subpart K. (WS.29)

Discussion

The very large number of noncompliances discussed by the self-assessment team in Department 7850 suggests that contractors' noncompliance is more serious than a few slip-ups. Contractors either do not understand the implications of accepting a contract with SNL (which states they must comply with OSHA), do not understand the requirements, or elect not to meet the requirements.

There were no concerns in the area of construction electrical regulations cited by the SNL, Livermore, Tiger Team. However, the team did observe a noncompliance at the Defense Engineering Laboratory (DEL) site, where a 220-volt AC power line ran on the ground from a temporary power hookup to a circular table saw. The cord was uncoiled and subject to insulation damage. In addition, at the DEL site, ground fault protection was not provided to the construction trailer electrical outlets. There was no assured equipment grounding program at the site.

The SNL, Livermore, observations noted above indicate that the attitude and practices observed by construction inspectors at SNL, Albuquerque, are widespread in the construction contractor community.

Finding SF-WS-82 [Reference APR-WS-28]

Contractors do not comply with the requirements of 29 CFR 1926, Subpart L, regarding the construction, configuration, and use of ladders and scaffolding. (WS.30)

Finding SF-WS-83 [Reference APR-WS-28]

No program exists for surveying all ladders and scaffolding for construction and utilization compliance. (WS.30)

Discussion

The very large number of noncompliances discussed by the self-assessment team in Department 7850 suggests that contractors' noncompliance is more serious than a few slip-ups. Contractors either do not understand the implications of accepting a contract with SNL (which states they must comply with OSHA), do not understand the requirements, or elect not to meet the requirements.

At SNL, Livermore, a mobile wheeled stepladder with missing rubber feet was observed at the entrance to a construction area. Ownership of the ladder was not determined. However, the presence of the noncompliant ladder indicated an inadequate construction inspection program, an observation made by the OCCUSAFE, Inc., OSHA compliance inspectors in their summary report to DOE.

Finding SF-WS-84 [Reference APR-WS-29]

Significant recurring violations by contractor employees concerning floor openings and protection during roofing operations are reported by Department 7850, indicating noncompliance with the requirements of 29 CFR 1926, Subpart M, Floor and Wall Openings. (WS.31)

Discussion

Roofing contractors utilize poorly trained employees, some of whom are illiterate and generally unaware of the requirements of 29 CFR 1926, Subpart M.

No comments were made by the OCCUSAFE, Inc., OSHA compliance inspectors regarding construction floor and wall openings at SNL, Livermore.

Finding SF-WS-85 [Reference APR-WS-30]

Although it is perceived that relatively high awareness exists in the construction community regarding the safe use of cranes, hoists, and derricks, many areas of noncompliance with the requirements of 29 CFR 1926, Subpart N, are found. (WS.32)

Finding SF-WS-86 [Reference APR-WS-30]

Noncompliance findings for program element WS.32 suggest that contractors are not aware of the detailed requirements of 29 CFR 1926, Subpart N. (WS.32)

Discussion

The performance criteria cited as noncompliant by Department 7850 suggest that contractor employees believe that they know how (by experience) to operate cranes, derricks and hoists, elevators, and conveyors. The operators lack formality (e.g., with regard to use of ANSI standard signals and posting of capacities, speeds, operating rules, etc.).

No observations were reported in the area of construction cranes, hoists, and conveyors by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

Finding SF-WS-87 [Reference APR-WS-31]

Vehicles used by contractors often do not comply with the regulations of 29 CFR 1926, Subpart O, particularly as the regulations apply to daily inspections, lights and reflectors, brake systems and lights, audible warning systems, cab protection, and locking devices. (WS.33)

Finding SF-WS-88 [Reference APR-WS-31]

Operation of vehicles by contractors does not always comply with the regulations of 29 CFR 1926, Subpart O, particularly as they apply to securing of tools. (WS.33)

Finding SF-WS-89 [Reference APR-WS-31]

Documentation of tests and inspections to demonstrate compliance with the regulations of 29 CFR 1926, Subpart O, has not been done. (WS.33)

Discussion

Although many of the criteria regarding this performance objective have been met, no formal program of oversight by all of the contractors exists to ensure and document compliance by their employees. Contractors and their employees are often not aware of the details of the regulations contained in 29 CFR 1926, Subpart O.

No observations were reported in the area of construction vehicles, equipment, and marine operations by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

Finding SF-WS-90 [Reference APR-WS-32]

Although the Facilities Construction and Environmental Engineering Department (7850) believes that construction trenching and shoring regulations contained in 29 CFR 1926, Subpart P, as updated and promulgated on March 5, 1990, are being met, it nevertheless recognizes the need to enhance oversight (constant reminder) because of the dangerous and unforgiving nature of this activity. (WS.34)

Discussion

Because of incidents such as have occurred at the SNL, Livermore, Trudell Site, construction trenching and shoring has received focused attention. Department 7850 believes that construction contractor community awareness is also increasing. The SNL Safety Engineering Division (3216) holds an opposing view. It asserts that many contract excavation jobs are shut down because of unsafe conditions as stated in the performance criteria and believes that there is no clear guidance in DOE orders on trenching and shoring.

The noncompliant excavation of hazardous waste at the SNL, Livermore, Trudell site presented an imminent danger.

Finding SF-WS-91 [Reference APR-WS-33]

Not all of the criteria associated with the performance objective of compliance with the regulations of 29 CFR 1926, Subpart Q, as they apply to concrete and masonry contractors, are being met. In particular, procedures for construction loads, guarding protruding reinforcing steel, framework designs and employment, and shoring are not formalized. (WS.35)

Discussion

Contractors' construction management use judgment based on past experience. The construction process lacks the formality and documentation required to ensure that the regulations contained in 29 CFR 1926, Subpart Q, are met.

No observations were reported in the area of concrete and masonry construction by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

Finding SF-WS-92 [Reference APR-WS-34]

Although the Facilities Construction and Environmental Engineering Department (7850) believes that the regulations relating to steel erectors in 29 CFR 1926, Subpart R, are being met, it plans to perform a preventive training briefing for the contractor who will work on the Weapons Production Primary Standards Laboratory (WPPSL). (WS.36)

Discussion

SNL recognizes the need to ensure that contractors are aware of the requirements of OSHA regulations. The briefing described in Finding SF-WS-92 is a step in the training process.

No observations were reported in the area of construction demolition by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

Finding SF-WS-93 [Reference APR-WS-35]

Construction demolition activities at SNL are not in compliance with the regulations of 29 CFR 1926, Subpart T, particularly as they apply to covering of floor openings, appropriate use of chutes, and complete documentation related to purging facilities before renovation or demolition. (WS.38)

Discussion

Since practices employed by demolition contractors do not comply with the regulations of 29 CFR 1926, Subpart T, the contractors appear either to be unaware of the regulations or are electing not to follow them.

No observations were reported in the area of construction demolition by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

Finding SF-WS-94 [Reference APR-WS-36]

The Facilities Operations and Maintenance Department (7810) at SNL, Albuquerque, asserts that its operations comply with the regulations of 29 CFR 1926, Subpart V, as they apply to power transmission and distribution. (WS.40)

Finding SF-WS-95 [Reference APR-WS-36]

The Facilities Construction and Environmental Engineering Department (7850) at SNL, Albuquerque, believes that procedures and equipment employed by contractors for power transmission and distribution do not comply with the regulations of 29 CFR 1926, Subpart V. (WS.40)

Discussion

The comments in Finding SF-WS-94 apply to internal SNL operations, while the comments in Finding SF-WS-95 apply to contractors. Some of the indicated noncompliance deals with specific tool and hardware deficiencies, which might suggest lack of understanding of the requirements of 29 CFR 1926, Subpart V, by the contractors.

Although Department 7810 believes that its operations comply with 29 CFR 1926, Subpart V (see Finding SF-WS-94), a near fatal accident occurred at SNL on July 15, 1989 (SNL UOR 89-11), during normal maintenance operations.

No observations were reported in the area of construction power transmission and distribution by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

Finding SF-WS-96 [Reference APR-WS-37]

Contractors are in compliance with the regulations in 29 CFR 1926, Subpart W, as they relate to rollover and overhead protection on construction equipment. (WS.41)

Discussion

The rollover and overhead protection systems required by this regulation are supplied by the manufacturers of the equipment. Construction inspectors at SNL note modifications or alterations that could cause noncompliance.

No observations were reported in the area of construction rollover and overhead protection by the OCCUSAFE, Inc., OSHA compliance inspectors at SNL, Livermore.

4.4.24.3 Action Plan Requirements

APR-WS-19. To enhance contractor and contractor employee compliance with the regulations contained in 29 CFR 1926, Subpart C, and applicable parts of 29 CFR 1910, a program needs to be developed and implemented by Department 7850. Such a program is needed to ensure that contractors and their employees are informed of the anticipated hazards associated with the work environment, that the contractor has prepared a safety program that meets all of the regulations prescribed in 29 CFR 1926 and 29 CFR 1910, and that the contractors comply with this safety program and applicable regulations.

A complementary construction ES&H program needs to be created and implemented by the Health and Safety Department (3210) in order to comply with DOE Orders 5480.9 and 5480.4.

The Purchasing Division (3722) needs to develop and implement a program to ensure that contractors comply with the requirements of 29 CFR 1926 and 29 CFR 1910.

APR-WS-20. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart D, as they relate to construction environmental controls at each job site.

APR-WS-21. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations regarding personnel protection equipment as contained in 29 CFR 1926, Subpart E.

APR-WS-22. Department 7850 needs to review its fire protection program in order to ensure that the requirements of 29 CFR 1926, Subpart F, are met and that training and oversight activities are documented appropriately.

APR-WS-23. Department 7850 needs to develop and implement a program regarding construction signs, signals, and barricades, so that contractors and their employees are aware of and comply with the requirements of 29 CFR 1926, Subpart G.

APR-WS-24. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart H, regarding construction materials handling.

APR-WS-25. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart I, as they relate to construction hand and power tools.

APR-WS-26. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart J, as they relate to welding and cutting.

APR-WS-27. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart K, as they apply to electrical construction activities.

APR-WS-28. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart L, as they relate to construction ladders and scaffolds.

APR-WS-29. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart M, as they relate to floor and wall openings.

APR-WS-30. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart N, as they apply to construction cranes, hoists, and conveyors.

APR-WS-31. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart O, as they apply to construction vehicles and equipment.

APR-WS-32. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart P, as they apply to trenching and shoring.

Division 3216 needs to clarify the DOE orders and guidance on trenching and shoring in order to ensure that DOE policy is understood and incorporated in the SNL trenching and shoring program.

APR-WS-33. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart Q, as they apply to concrete and masonry construction. The program must recognize that economic pressures and contractor experience have created a culture where inadequacy and expedience could encourage noncompliance with OSHA regulations, and because of the temporary nature of construction aids, continual oversight will be required.

APR-WS-34. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart R, as they apply to construction steel erection.

APR-WS-35. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart T, as they apply to construction demolition.

APR-WS-36. Department 7850 needs to develop and implement a program to ensure that contractors and their employees are aware of and comply with the regulations contained in 29 CFR 1926, Subpart V, as they relate to power transmission and distribution.

APR-WS-37. In spite of Finding SF-WS-95, that contractors are in compliance with the regulations relating to overhead and rollover protection on construction equipment, Department 7850 needs to develop and implement a program to ensure that contractors and their employees continue to be aware of and comply with the regulations contained in 29 CFR 1926, Subpart W. APR-PR-02 also provides for general requirements for a management policy and training program for onsite contractors.

Chapter 5
Management

Chapter 5

Management Practices Assessment

5. Management Practices Assessment

5.1 Purpose

The purpose of the management self-assessment was to evaluate the effectiveness of management and its commitment to ES&H programs at SNL.

5.2 Scope

The management self-assessment covered management practices, attitudes, and policies focusing on organization, management qualifications, personnel, and management systems that stressed appraisal systems, self-assessment, resources, communications of the ES&H responsibilities, and ES&H documentation. Interviews were held with selected SNL management staff. The self-assessment team also reviewed appropriate DOE orders, SNL internal procedures, and the SNL, Livermore, ES&H Self-Assessment (pre-Tiger Team) and Tiger Team reports.

5.3 Methodology

The management self-assessment followed the general procedure explained in Section 1.4. The management self-assessment team reviewed 877 findings input sheets (FISs) interviewed the president, executive vice presidents, and selected vice presidents, directors, and department managers at SNL, Albuquerque. The team also relied upon its personal observations and judgments developed during the self-assessment process.

Guidance was obtained from Secretary Watkins' July 31, 1990, Guidance on Environment, Safety, and Health Self-Assessments, and DOE Orders 5480.19 and 5482.1B. Additionally, the Tiger Team Guidance Manual, February 1990, Chapter 4.3, was reviewed along with the DOE Environmental Audit Manual Section 13, the DOE Technical Safety Appraisal Reference Manual, April 1990, and the ESH&QA Management Appraisal Program Development (Attachment 1, "Procedure for Conducting Management Appraisals of ESH&QA Activities," September 11, 1989). The team also reviewed an Assessment of Regulatory Compliance of ES&H Programs at SNL, Albuquerque, Chapters II and III, prepared by IT Corporation, July 1990.

5.4 Significant Findings and Action Plan Requirements

5.4.1 Organization

5.4.1.1 Overview

The management self-assessment team evaluated the effectiveness of the SNL management structure in focusing and implementing ES&H requirements. The assessment focused on six performance objectives. In essence, they require (1) clearly defined, understood, and effectively implemented organizational structures, assignments and responsibilities, (2) a strong, well-defined commitment to excellence in ES&H, (3) effective structure, (4) thorough communication throughout all levels of the organization, (5) appropriate support of the senior executives, and (6) responsibility and accountability at appropriate levels to effectively implement ES&H program objectives.

Day-to-day management of SNL is conducted through its president, two executive vice presidents, nine vice presidents, 40 directors, 163 department managers, and 616 division supervisors. The management hierarchy reflects a typical corporate structure. The president is responsible and accountable for all activities undertaken by SNL personnel. ES&H is a prime responsibility of Executive Vice President Lee Bray (Organization 30). Nestor Ortiz, Director of ES&H, is directly responsible for the conduct of SNL ES&H programs, including management of its waste facilities. Effective December 1, 1990, this structure was reorganized to include Vice President Glen Cheney. Responsibility and accountability for implementation of ES&H programs for specific facilities and work activities are assigned to the line manager of that facility or project.

5.4.1.2 Significant Findings

Finding SF-OR-01 [Reference APR-OR-01]

At the time the self-assessment was conducted, roles, responsibilities, authorities, and interrelationships were not clearly understood, fully documented, nor systematically implemented throughout SNL. (OR.01 through OR.06)

Finding SF-OR-02 [Reference APR-OR-01]

SNL is in a major transitional phase in its organizational structure and operations to provide a quality ES&H product. (OR.02 through OR.04)

Discussion

In July 1990, the SNL ES&H organizational structure and operations did not provide an adequate basis to provide a quality product. At that time, SNL began to develop from the top down an organizational structure that is intended to provide for the effective implementation of ES&H programs. Although top management feels that the structures and responsibilities have been well defined by the draft SNL ES&H policy, requirements and responsibilities document, and the SNL Environmental Council Charter, that perception degrades progressively at each level of management down to the working levels, where chaos is perceived by many.

Vague management commitments and pronouncements that have not been followed up with specific requirements have hindered line acceptance and implementation of the structure providing for effective ES&H implementation. Goals are presently ill defined so that excellence cannot be identified or measured. Because employees are generally not aware of what is expected of them or their organization, corporate energy is dissipated by efforts to anticipate and achieve undefined (and possibly incorrect) standards.

Moreover, some SNL employees do not perceive all senior managers as substantively committed to understandable ES&H goals and requirements. Thus, employee support is often tentative or lackluster.

There is a widespread perception that communication of ES&H goals and objectives is either untimely or ineffective. As a result, when the processes and requirements are poorly understood, acceptance of responsibility and accountability are often lacking.

Thus, although an incipient ES&H structure is in the formative stages at SNL, the application of resources and support of that structure have not come together. As a result, there is confusion and duplication of efforts when SNL management and employees seek to achieve ES&H compliance and DOE objectives without clear policy objectives and requirements.

The management self-assessment at SNL shows that corporate executives have learned from the SNL, Livermore, Tiger Team findings as embodied in the SNL, Livermore, responses to those findings that apply to this area (SNL, Livermore, action plans M1, M5, M7, M9, and M11). Progress has been made in establishing a structure in which roles, responsibilities, authorities, and interrelationships are clearly communicated, fully documented, and systematically implemented pursuant to the draft ES&H Policy, Requirements, and Responsibilities Document. Since much work remains to be done on this document, there is a degree of similarity between SNL, Albuquerque (including TTR and KTF), and SNL, Livermore, with respect to the lack of a current functional framework and organizational structure that provides clear direction

to employees at all levels. Efforts by individual managers to meet ES&H requirements are still being conducted independently of centralized management control, although there has been some progress in focusing these activities within the structure of the draft ES&H Policy, Requirements, and Responsibilities Document.

Because Sandia Corporation is in a major transition, a principal difference between activities observed at Albuquerque and those observed at Livermore is one of a focused effort at Albuquerque to bring all elements of the organization into a single, top-down-directed compliant organization. This activity clearly was absent in Livermore at the time of its assessment by the DOE Tiger Team.

5.4.1.3 Action Plan Requirements

APR-OR-01. SNL must move from its current transitional phase into a well documented and understood structure for the management of ES&H requirements. A clear policy statement and implementation hierarchy must be developed that provides for appropriate support and accountability at all levels of the SNL organization.

5.4.2 Management Qualifications

5.4.2.1 Overview

Management must be competent and trained to meet its ES&H responsibilities. In addition, managers must have a positive attitude toward the performance of these responsibilities and a well-founded knowledge of the ES&H requirements that relate to their job assignments.

In July 1990, competent managers who were well trained and qualified to perform ES&H responsibilities were concentrated primarily in the ES&H Directorate (3200). These professionals were highly trained and motivated to identify and meet ES&H requirements applicable to SNL activities. Their lack of knowledge about the details of activities in most line organizations hindered the effective communication and accomplishment of ES&H objectives.

Conversely, most other managers are highly competent and trained in their individual areas of specialization, with little cross-training in ES&H. Their lack of knowledge of ES&H requirements has hindered their ability to recognize, seek appropriate guidance for, and meet ES&H needs in their operations.

5.4.2.2 Significant Findings

Finding SF-MQ-01 [Reference APR-MQ-01]

Training in, and knowledge of, ES&H requirements are inconsistent throughout SNL. (MQ.01 and MQ.02)

Discussion

Recognition of, and commitment to, ES&H responsibilities and objectives as they relate to the daily activities of SNL managers are inconsistent. Although there has been a heavy emphasis by top management on ES&H compliance, most individual managers have little background in, or knowledge of, ES&H requirements. They rely on the Environmental Programs Department and Health and Safety Department to provide them with training and information concerning ES&H requirements applicable to the details of their daily work.

The Environmental Programs Department and the Health and Safety Department have historically viewed their role as advisory or as support. In this role, they are ill equipped to initiate the functions envisioned by most line managers, who may expect these groups to provide facility-specific training. This miscommunication about roles and responsibilities has hindered training and the transfer of knowledge necessary for individual managers to determine the application of ES&H requirements to their daily activities.

In addition, the very high degree of specialized knowledge developed by the technical staff is sometimes an impediment. SNL scientists and project managers are often world leaders in knowledge about specific hazardous substances and their properties. This background can provide a false sense of understanding safety and environmental requirements for both individual scientists and for the technicians who report to them.

Nevertheless, there remains a widespread commitment on the part of managers at all levels to meet ES&H program requirements when they are developed and communicated to them. Since most of these programs are presently in varying stages of formation, many managers have adopted a "wait and see" attitude. As programs are put in place, objective measurements can be taken on whether managers are competent and qualified to fulfill their ES&H responsibilities in their day-to-day activities.

The assessment at SNL, Livermore, did not precisely address the management qualification performance objectives set forth in the Procedures for Conducting Management Appraisals of ESH&QA Activities. Nevertheless, general findings on individual accountability and ownership and QA provide parallel

information. As in Albuquerque, employees at SNL, Livermore, were unclear on their responsibilities and accountability for ES&H performance in their day-to-day operations. Both organizations showed a general lack of familiarity with resources available to become fully competent and qualified to discharge their ES&H responsibilities.

5.4.2.3 Action Plan Requirements

APR-MQ-01. SNL must transform its commitment to ES&H excellence into quantifiable programs that provide all managers with sufficient training to recognize and meet ES&H requirements as they apply to their daily activities.

5.4.3 Personnel

5.4.3.1 Overview

Management must provide an adequate staff of qualified personnel to develop and implement effective ES&H programs. Sufficient personnel with the necessary experience, training, certification, and motivation must be available to ensure appropriate program execution to meet the goals and objectives. The total staff and management must support and execute a fitness-for-duty program to ensure a safe and secure working environment, as required by DOE Order 5480.8.

Current staffing levels are determined by the ES&H Directorate (3200) and each line organization independently. The staff levels have been determined by each individual organization based on their interpretation of the requirements of the SNL ES&H Manual as applied to their organization and balanced against the requirement to keep the overhead sufficiently low to remain competitive. The fitness-for-duty program is controlled and administered by Directorate 3300. The program level is set to meet the need perceived by that Directorate.

5.4.3.2 Significant Findings

Finding SF-PR-01 [Reference APR-PR-01]

SNL does not have the adequate, well-trained staff required to develop and implement an ES&H program that will fully meet modern practices. (PR.01 and PR.02)

Discussion

At the time selected for evaluation, SNL was primarily staffed in the historical mode, where most ES&H expertise was in Directorate 3200 and a very few trained and qualified personnel in the line. The function of Directorate 3200 was guidance, review, and some approval. In early 1990, it became clear to SNL that the ES&H system required significant improvement. Directorate 3200 initiated a hiring program and added contract staff. As it became obvious to the line that they would have to have personnel with ES&H training and expertise, the line organizations initiated hiring ES&H personnel, hiring contractors and training willing staff. The implementation of this staff change has been initiated in some organizations, but in a relatively haphazard, unplanned and uncontrolled manner. Hence, the relative progress across the Laboratories is uneven, with an ill-defined final state.

SNL, Livermore, Tiger Team Key Finding MK-4 and Finding M8 identify the same staffing problem identified here.

Finding SF-PR-02 [Reference APR-PR-02]

The issue of proper training of contractors, visitors, and temporary employees has not been resolved and implemented.

Discussion

Except for Area V (Reactor Facilities), there are few requirements to train visitors in SNL ES&H requirements. This training is left to the discretion of the host.

Contractors who work at SNL are often put through general training with the SNL staff with whom they work. There are no clear, well-defined, or widely understood instructions of contractor training requirements.

The issues of contractor, visitor, and temporary employee training were not perceived as key findings at SNL, Livermore.

Finding SF-PR-03 [Reference APR-PR-03]

The fitness-for-duty program has been partially developed for a long time. It still requires additional work in training, formality, and data collection with tracking and analysis. (PR.03)

Discussion

Of the four fitness-for-duty programs, the ones for drugs and alcohol are generally perceived to be in good shape. Those for physical or psychological condition are less well developed. The organization supervisor is the primary person responsible for the implementation of these policies. They are usually

trained upon promotion, but are not involved in continuing training programs. The policies relating to contractors and visitors are not clearly spelled out. There is a need to put the program on a more formal, documented basis and add an improved data collection and analysis program to include tracking and analysis of trends. This program was not the subject of a key finding at SNL, Livermore.

5.4.3.3 Action Plan Requirements

APR-PR-01. A well-documented assessment should be prepared by Organization 3 of the SNL ES&H staffing requirements for the line, transition, and Directorate 3200 and 3600 activities. The assessment should be compared with the current staff capabilities and hiring programs. Staff assignments and hiring programs should then be appropriately adjusted.

APR-PR-02. Organizations 3200, 3400, 3700, 4000, 7800, and 8500 need to determine a policy and training program for onsite contractors, visitors, and temporary employees. Comparable action plan requirements are found at APR-WS-(1-18)A. Local action plans OA-08-01, OA-08-27, and OA-01-30 also support this activity.

APR-PR-03. Formal, comprehensive documentation of the fitness-for-duty program is required, including consideration of safety and security sensitive positions. The appropriate training program should be developed and implemented. Visitor, contractor, and temporary employee issues must be addressed. In addition, the program needs to be implemented with the addition of an improved data collection and analysis program to include tracking and trending. Local action plans OA-08-01, OA-08-27, PR-02-24, and PR-03-01 support this activity.

5.4.4 Management Systems

5.4.4.1 Overview

Performance objectives in this area examined management systems for ES&H: planning and budgeting, interpretation and implementation of DOE and regulatory requirements, QA, performance measurement and self-assessment, risk assessment and risk management, identification and investigation of unusual occurrences, and root cause analysis.

In most areas, the present management system relies heavily on the good technical judgment of division supervisors and department managers. There is little formal ES&H management structure outside of Directorate 3200. Line

supervisors are primarily responsible for safety, with guidance from the ES&H Manual, the Pressure Safety Manual, occasional memoranda, and assistance from professionals in the ES&H Directorate. SOPs prepared at the department level provide a framework for conduct of hazardous operations. Performance is largely undocumented -- division supervisors conduct a safety review twice a year using a standard form, and VP Safety, Health, and Environment Appraisal Committees (SHEACs) review departments on a prioritized schedule, generally annually for high-risk activities and biannually for all others.

Management of SNL reactors and other activities with large potential hazards (e.g., PBFA-II) is more formal. Management of these facilities is based on the DOE TSA performance objectives.

A formal corporation-wide, top-down management system for ES&H is under development, but is not yet in place.

5.4.4.2 Significant Findings

Finding SF-MY-01 [Reference APR-MY-01]

At present, SNL management of ES&H does not meet the standards for an effective management system as outlined in DOE Order 5482.1B, paragraph 10. (MY.01 through MY.12)

Discussion

The management system to ensure that DOE policies and requirements are appropriately interpreted and implemented is still largely undocumented, so there are many differences in the content and formality of procedures implemented by line organizations. This deficiency is being addressed by new corporate ES&H policies and programs, but these are not yet in place. Confusion exists during the transition process.

There is no high-quality corporate process for short- and long-range planning and budgeting for ES&H. The cost of implementing the new policies and procedures is not known. Requirements for budgeting and charging ES&H tasks have been changed several times, leaving the line unclear on what is expected.

SNL does not have an effective lessons-learned program. There is no procedure for distributing occurrence reports from SNL and other DOE contractors to potentially interested line organizations. Root cause analysis and trend analysis for SNL occurrences are superficial. There have been seven reportable incidents involving explosives safety in the last two years; none of the closeouts reference any of the previous incidents. Similar conditions were identified in the Tiger Team assessment at SNL, Livermore.

SNL has initiated a massive effort to develop and implement an effective ES&H management system since the SNL, Livermore, Tiger Team visit. This effort is widely seen as strong evidence of top management support in response to the SNL, Livermore, Tiger Team findings (Finding M6) and the beginning of a process to achieve DOE ES&H objectives (Finding M7). Because it is still in development, the new system is largely invisible to line organizations. Roles and responsibilities are consequently still undefined (Findings M1 and M2), and the functions still cited as inadequate at Livermore are quality assurance (Finding M3), comprehensive resource planning (Findings M8 and M11), self-appraisal (Finding M9), and issues management (M10).

Finding SF-MY-02 [Reference APR-MY-01]

Transition to the new ES&H management process has not been planned well in some areas, with the result that management of ES&H has been degraded. (MY.02 through MY.12)

Discussion

Line organizations have been instructed not to develop new procedures or modify existing ones until the new ES&H programs are in effect. Some organizations still conduct SHEAC reviews, others are transitioning to self-assessment at the department, directorate, and VP levels, and others are not doing performance appraisals while awaiting definition of the new program. There is confusion about the system for approving new SOPs, with the result that organizations are using out-of-date or no SOPs for hazardous operations. The moratoriums on approval of SOPs were identified as a contributing factor in a recent serious incident.

There were no similar findings by the Tiger Team at SNL, Livermore.

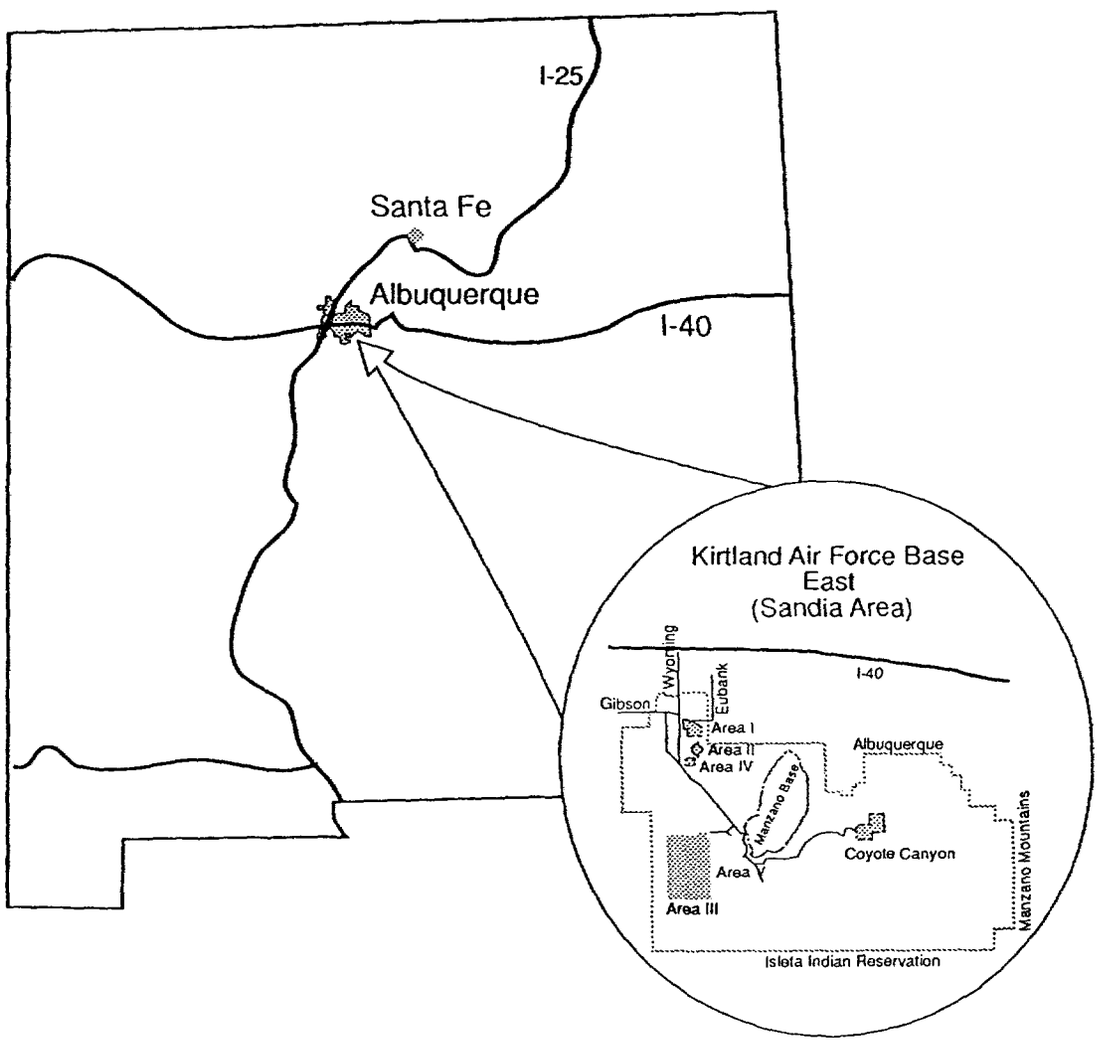
5.4.4.3 Action Plan Requirements

APR-MY-01. SNL must establish a procedure to implement the requirements of DOE Order 5482.1B, paragraph 10, for environment, safety, and health appraisals. Once the procedure is established, it must be implemented, audited, and updated as management systems evolve at SNL.

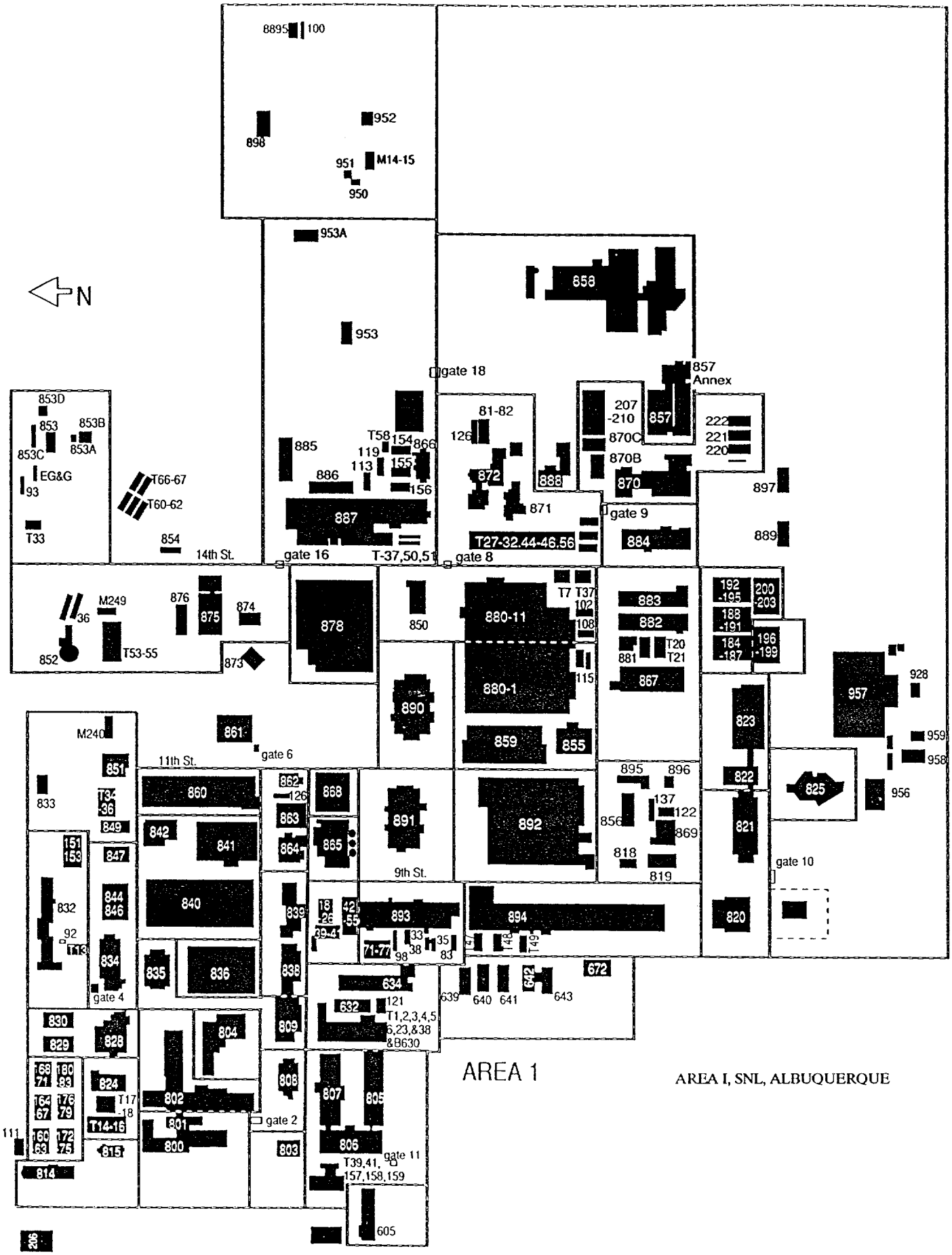
Appendix A
Site Maps

Appendix A

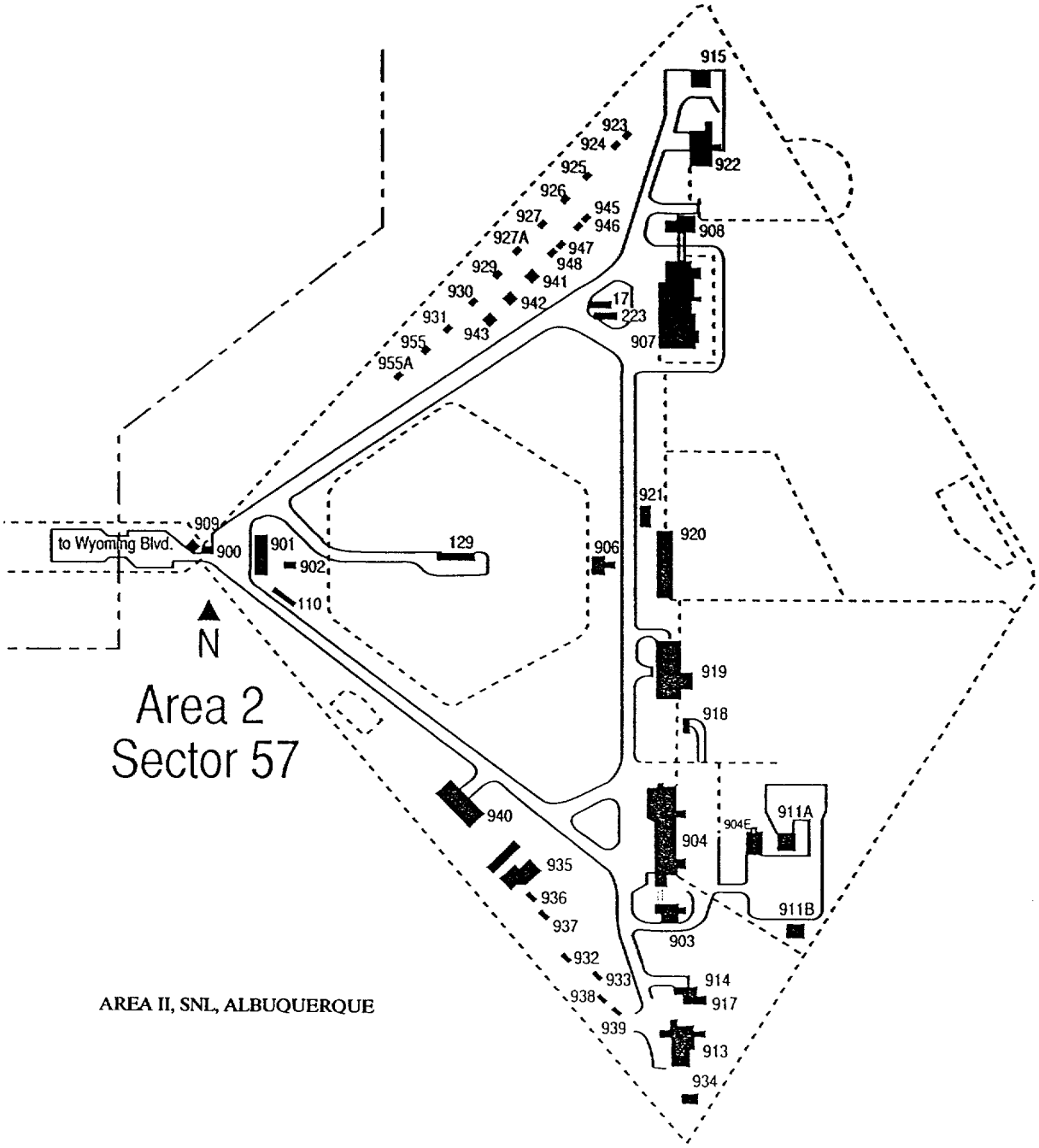
SNL Site Maps



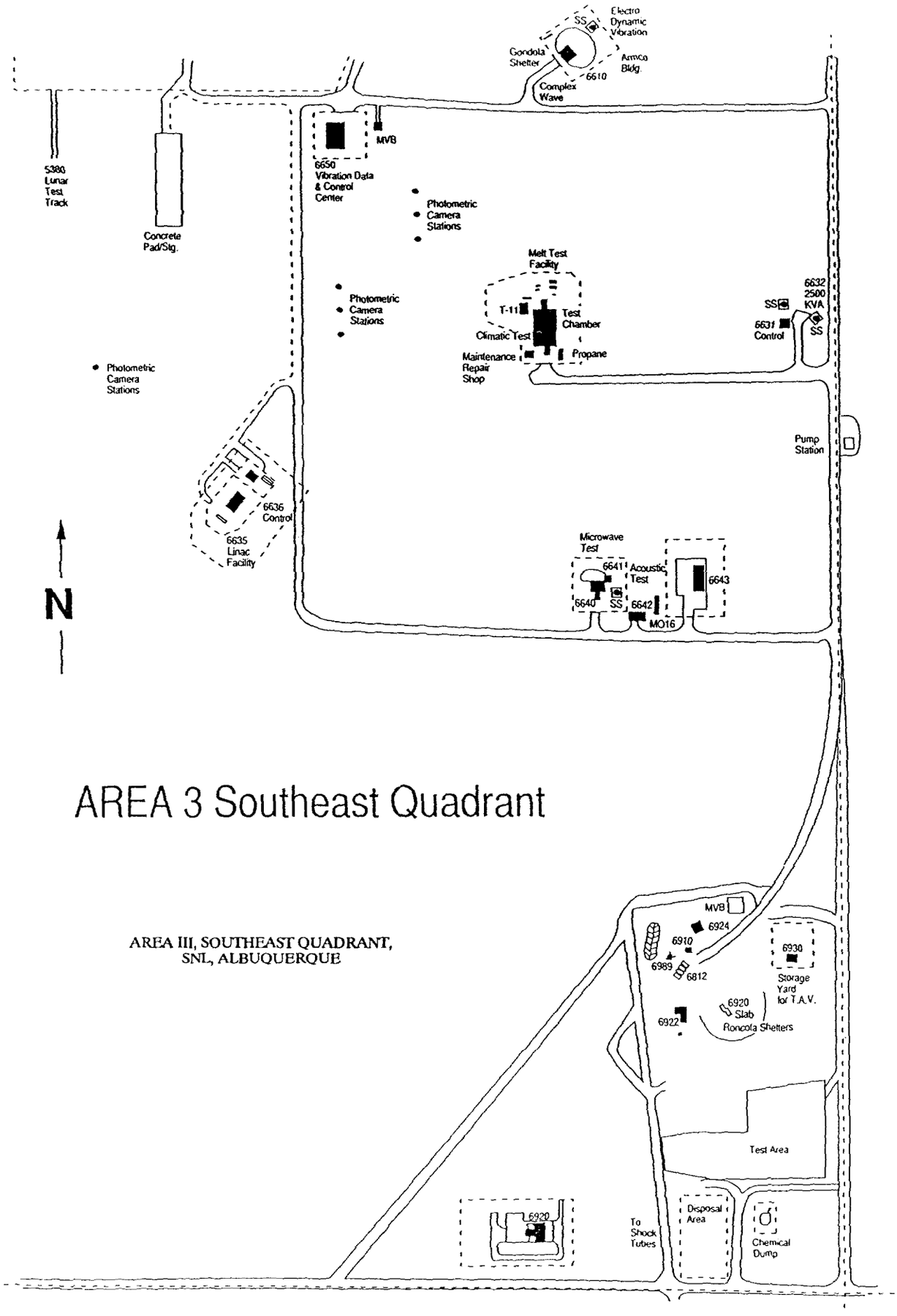
SNL, ALBUQUERQUE

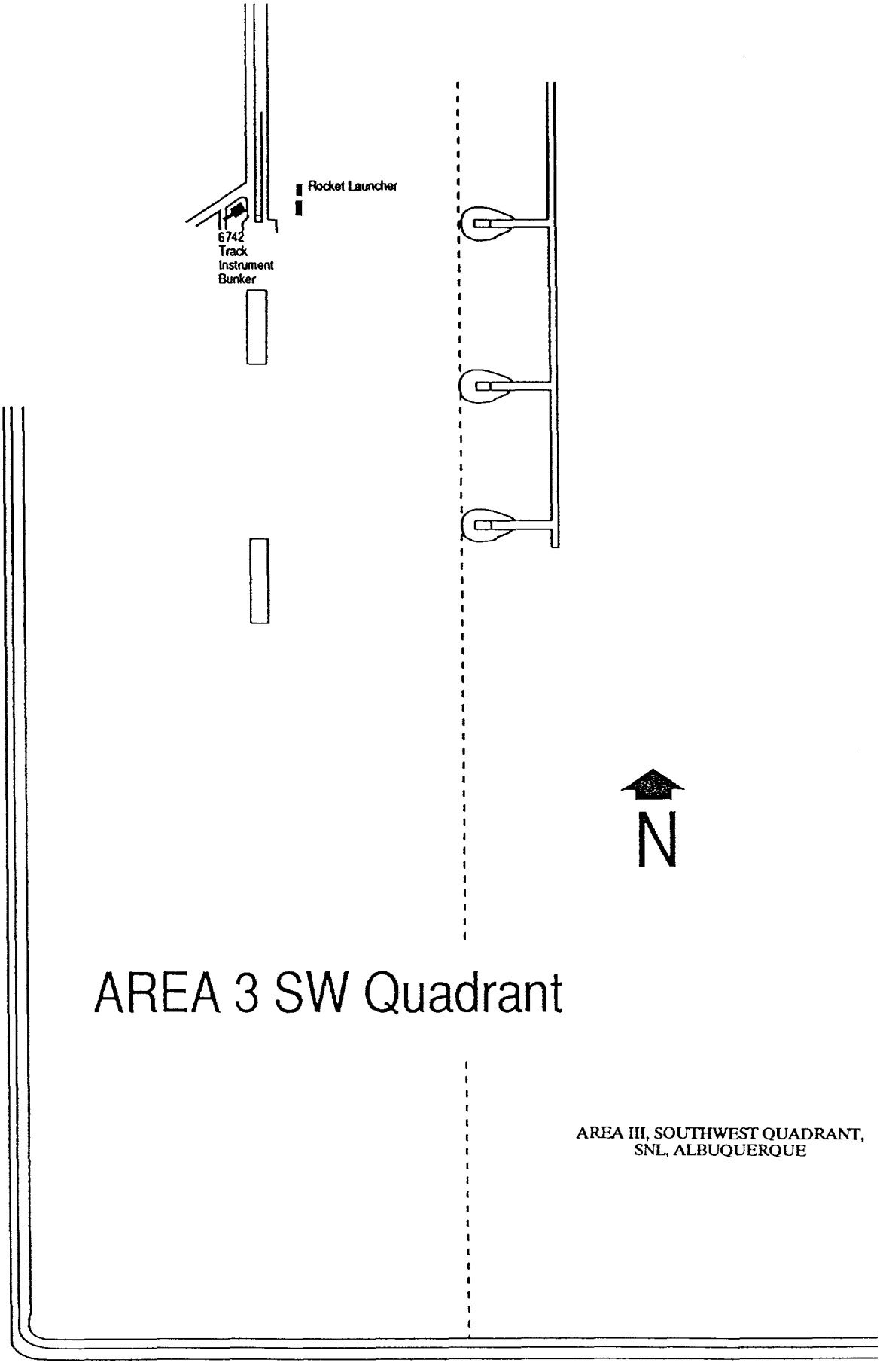


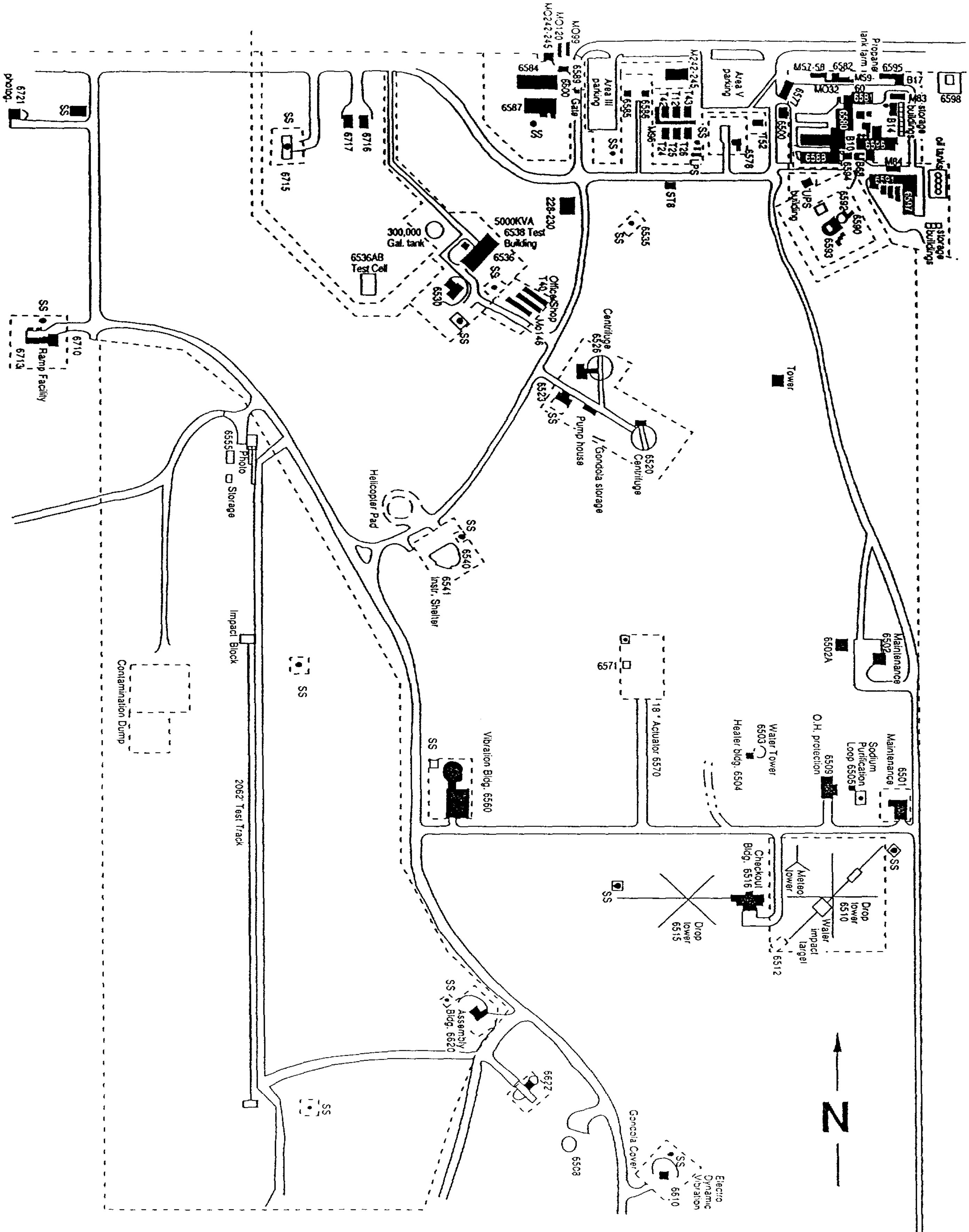
AREA I, SNL, ALBUQUERQUE



AREA II, SNL, ALBUQUERQUE

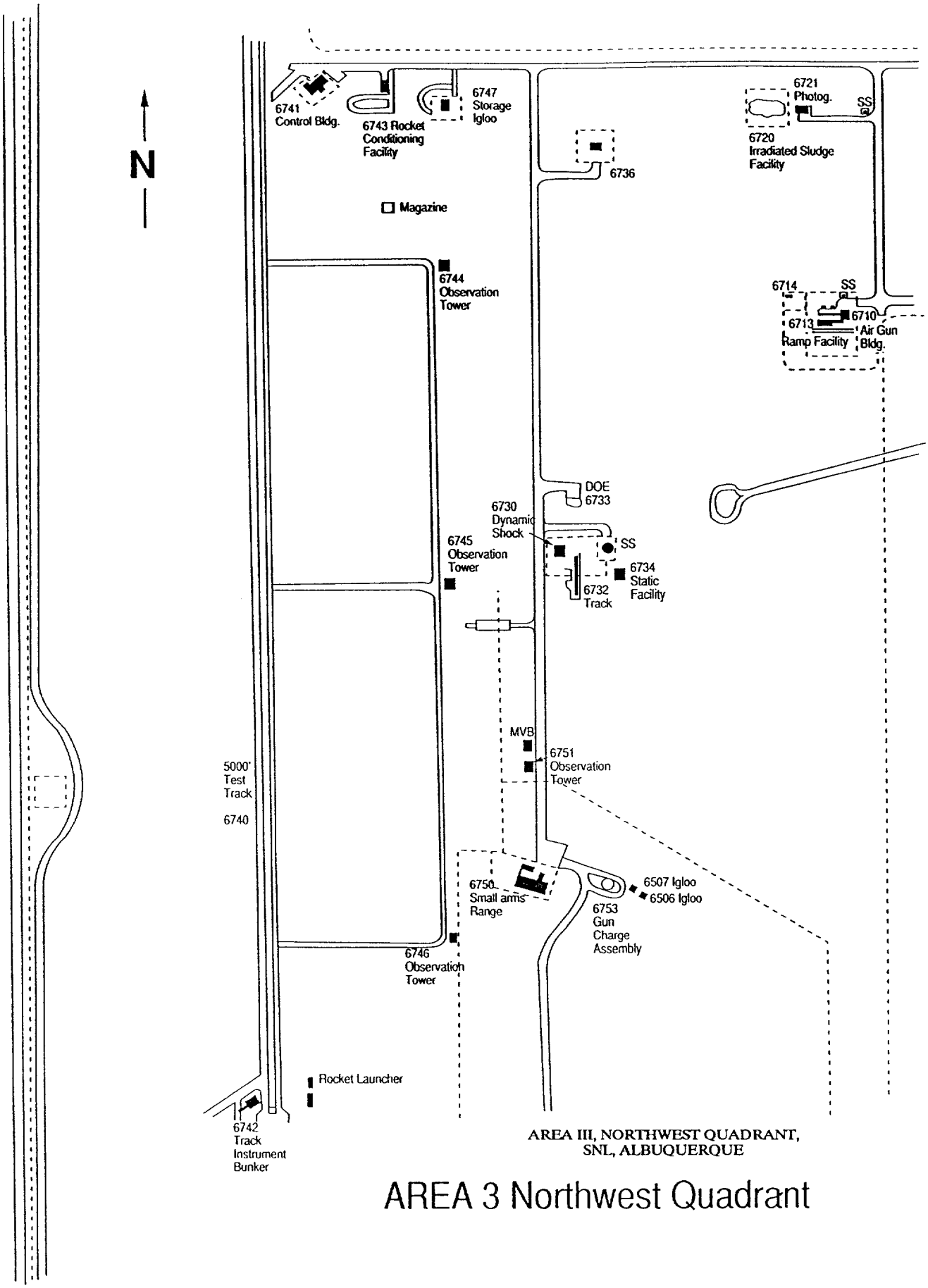

Electro Dynamic Vibration
SS
Gondola Shelter
Armco Bldg.
6610
Complex Wave
MVB
6650 Vibration Data & Control Center
5380 Lunar Test Track
Concrete Pad/Stg.
Photometric Camera Stations
Melt Test Facility
T-11
Test Chamber
Climatic Test
Maintenance Repair Shop
Propane
6632 2500 KVA
SS
6631 Control
SS
Photometric Camera Stations
Photometric Camera Stations
Pump Station
6636 Control
6635 Linac Facility
N
Microwave Test
6641
Acoustic Test
6643
6640
SS
6642
MO16
AREA 3 Southeast Quadrant
AREA III, SOUTHEAST QUADRANT, SNL, ALBUQUERQUE
MVB
6924
6910
6930
6989
6812
Storage Yard for T.A.V.
6920 Slab
6922
Roncola Shelters
Test Area
6920
To Shock Tubes
Disposal Area
Chemical Dump


Rocket Launcher
6742
Track
Instrument
Bunker
N
AREA 3 SW Quadrant
AREA III, SOUTHWEST QUADRANT,
SNL, ALBUQUERQUE

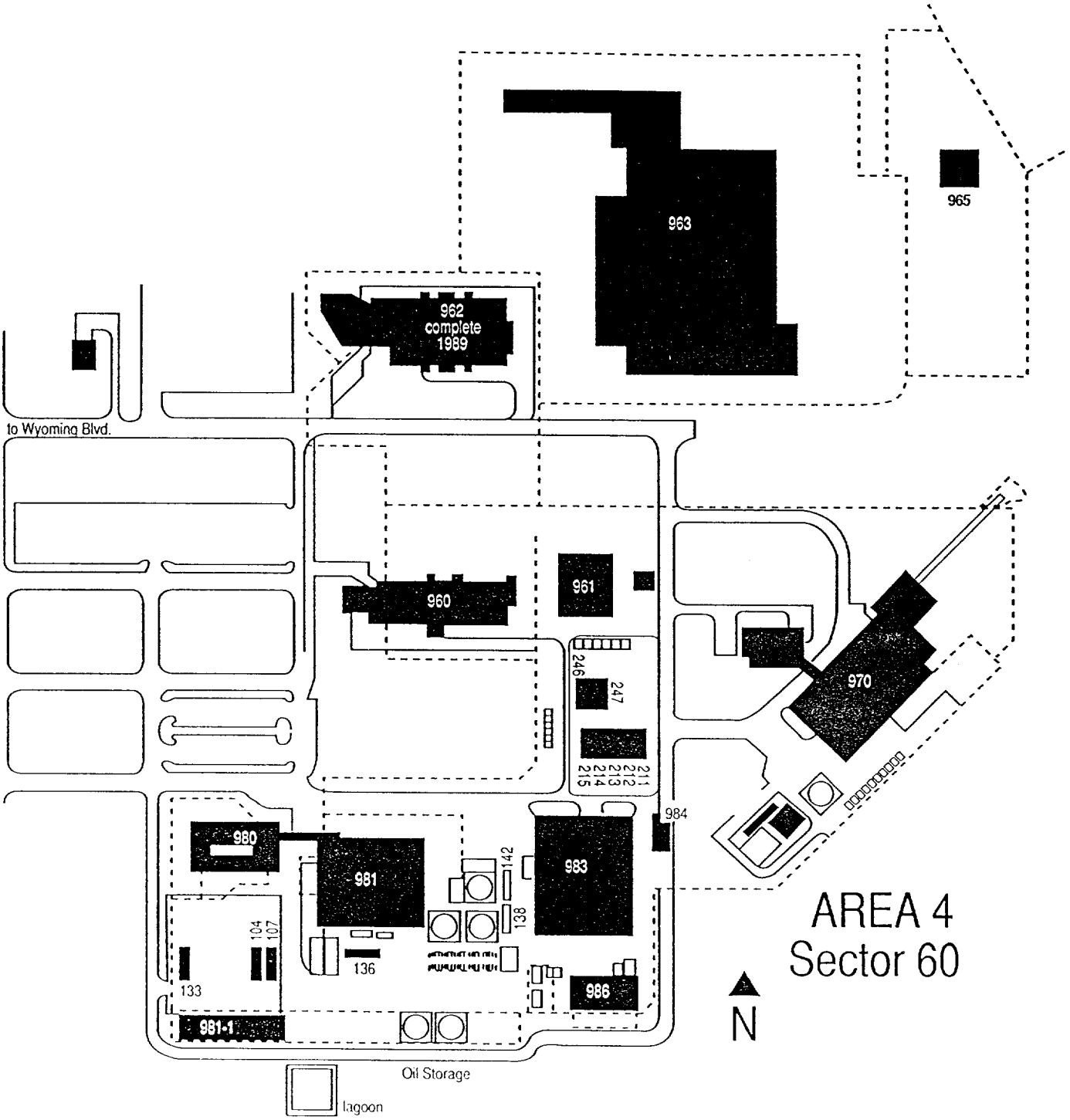


AREA 3 Northeast Quadrant

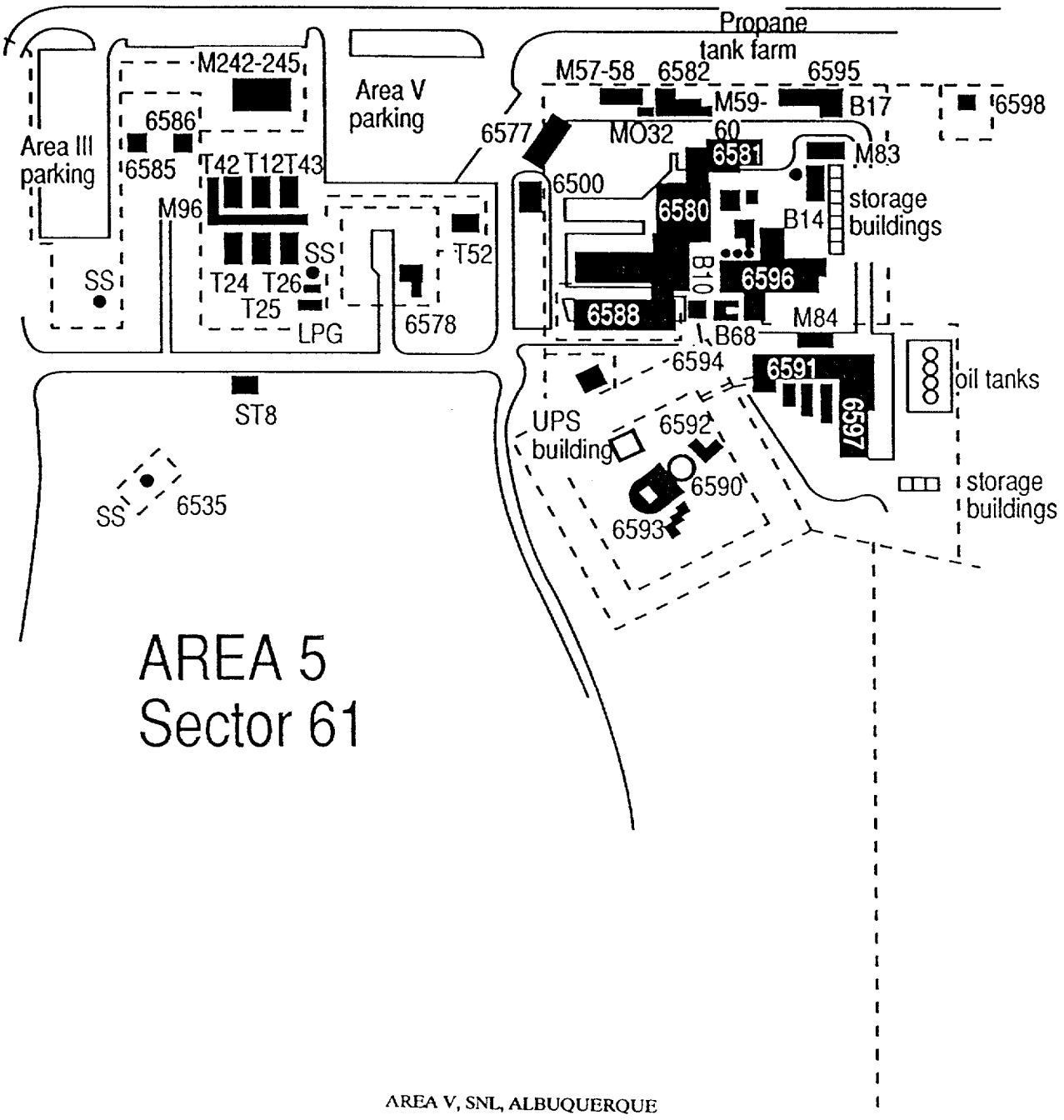
AREA III, NORTHEAST QUADRANT,
SNL, ALBUQUERQUE



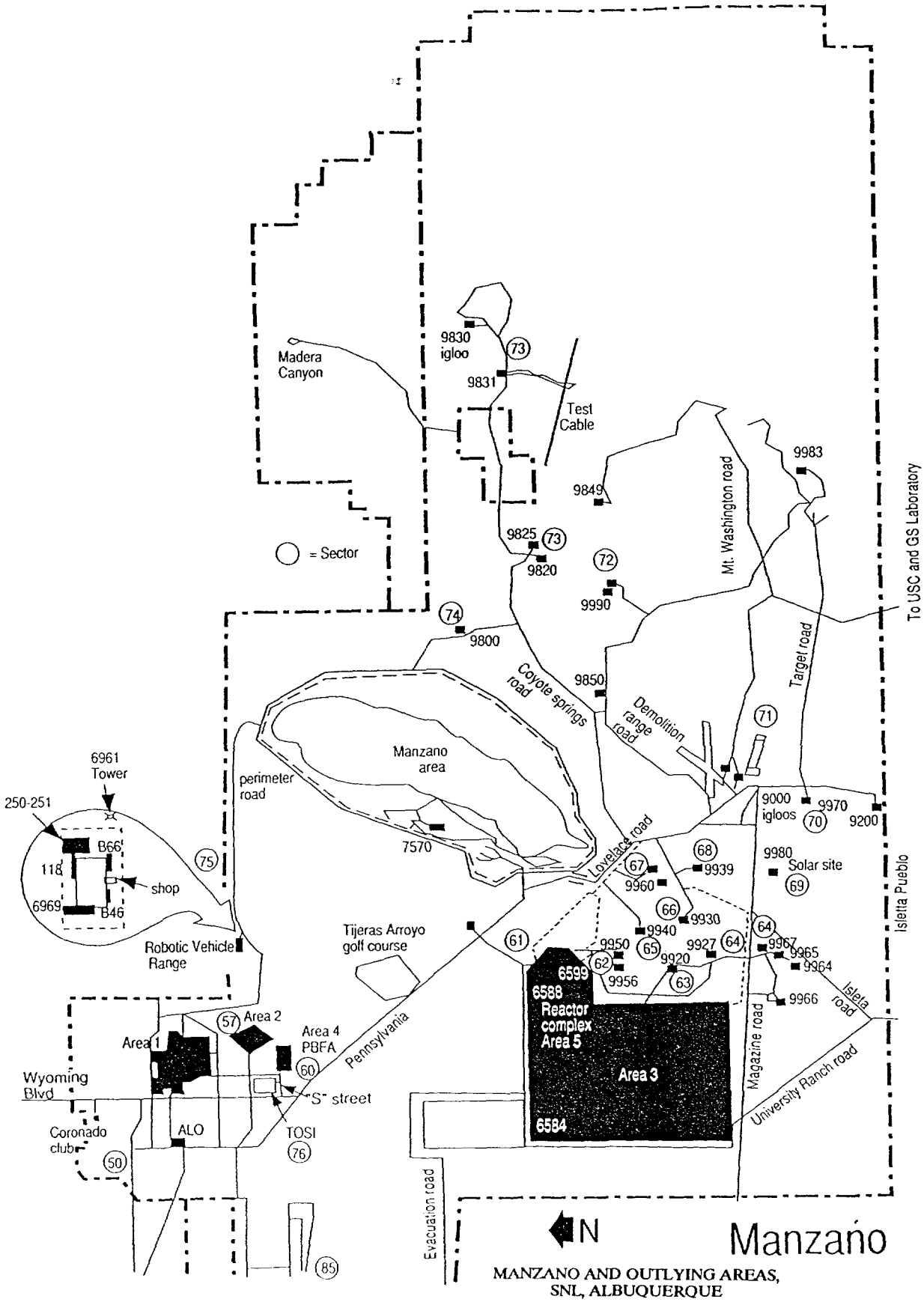
AREA 3 Northwest Quadrant



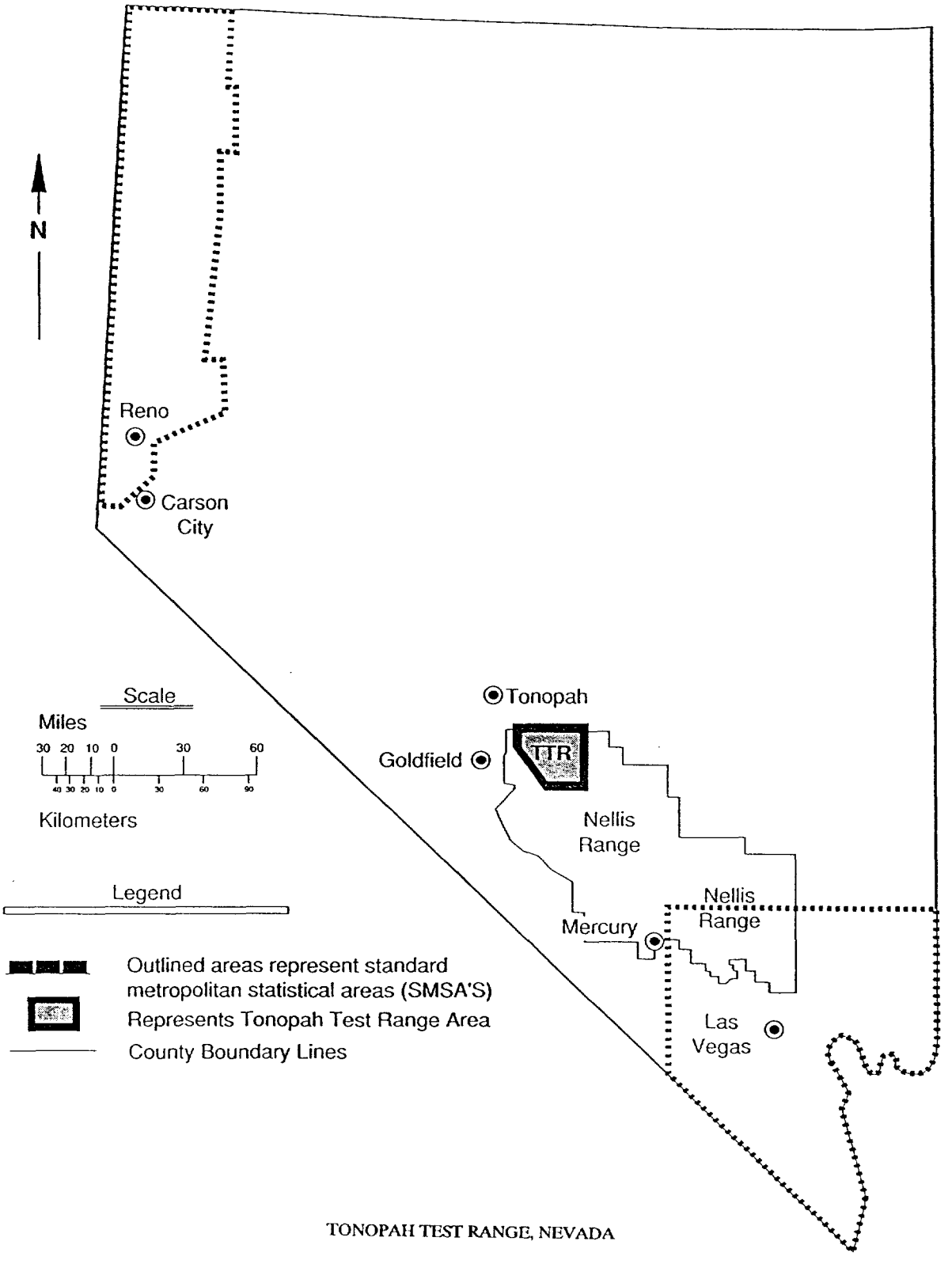
AREA IV, SNL, ALBUQUERQUE



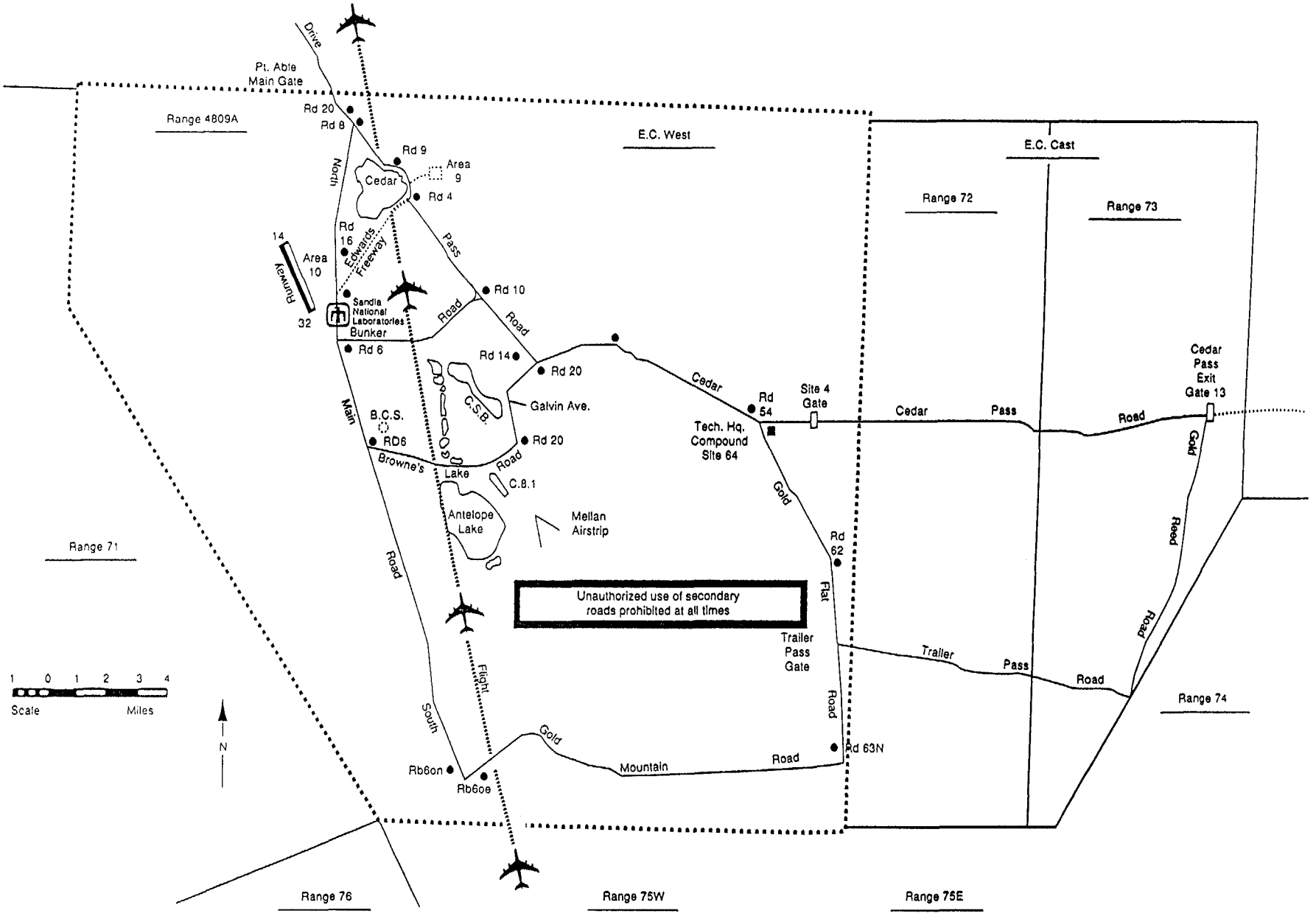
AREA V, SNL, ALBUQUERQUE



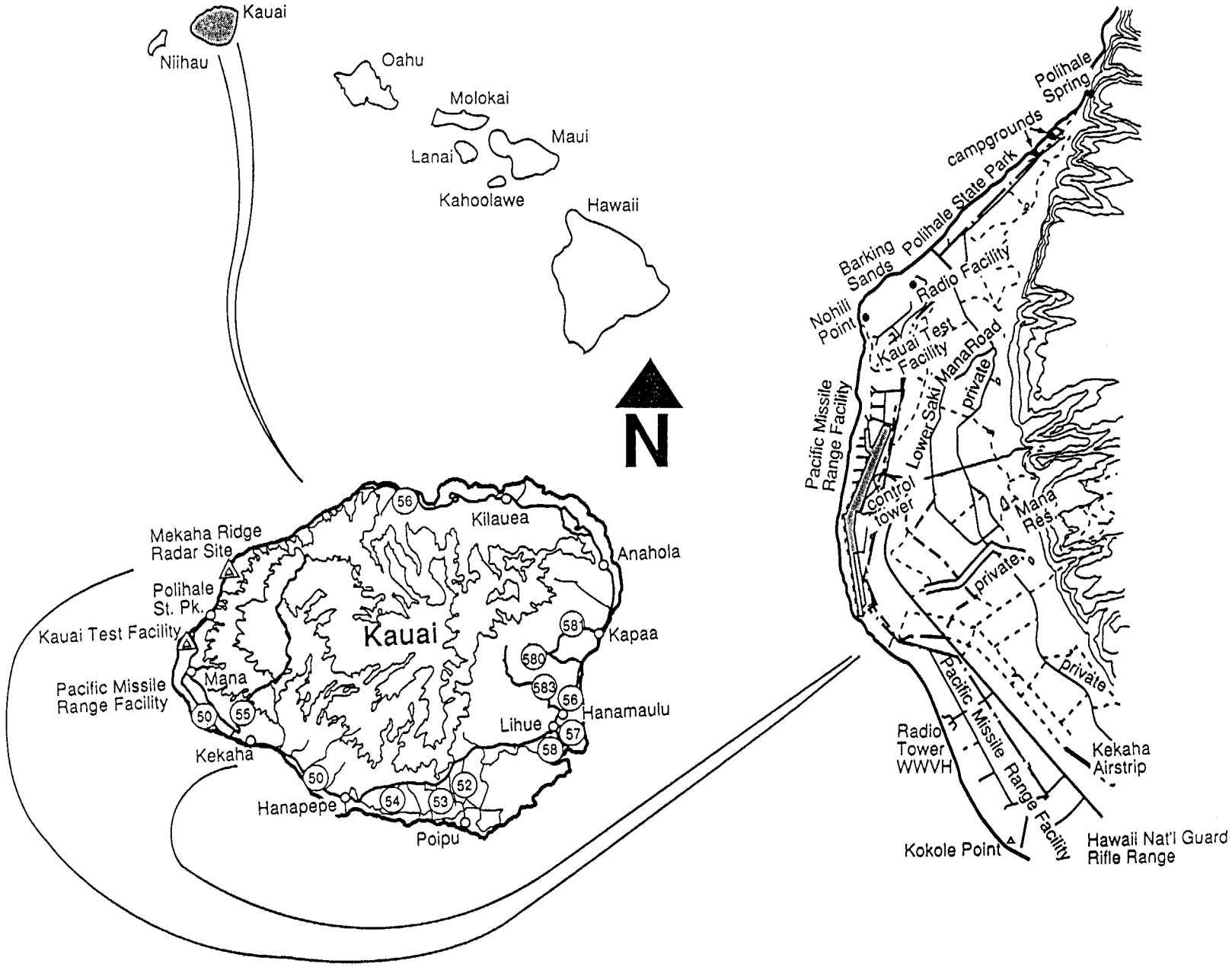
MANZANO AND OUTLYING AREAS, SNL, ALBUQUERQUE



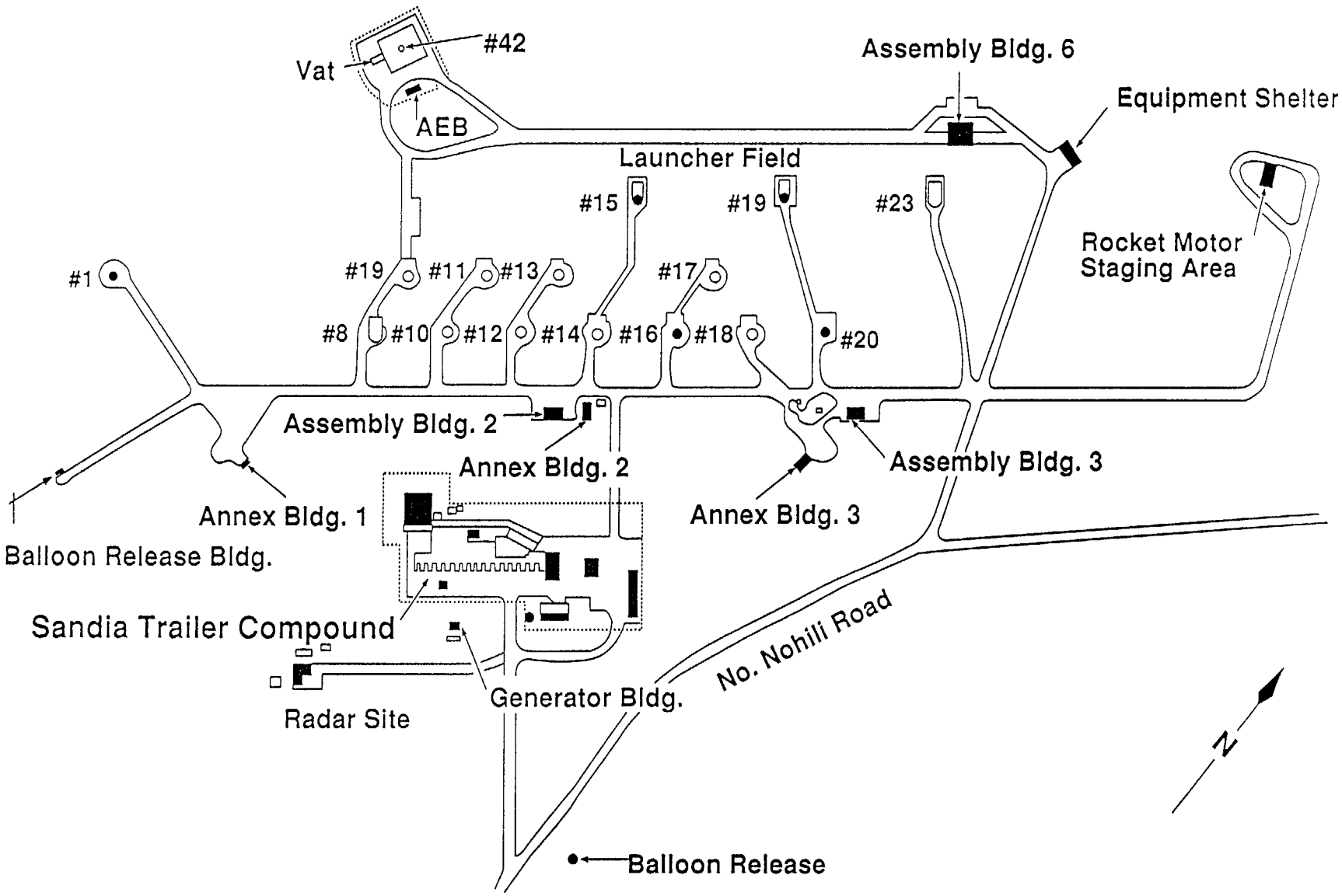
TONOPAH TEST RANGE, NEVADA



TONOPAH TEST RANGE, NEVADA



KAUAI TEST FACILITY, HAWAII



KAUAI TESTING FACILITY,
HAWAII

Appendix B
SAWG Charter

Appendix B

Self-Assessment Working Group (SAWG) Project Plan

SELF-ASSESSMENT

WORKING GROUP (SAWG) PROJECTION PLAN

DRAFT REVISION 4

October 24, 1990

Approved:

E. D. Graham, Jr. 10/29/90

E. D. Graham, Jr., SAWG Coordinator

Nestor R. Ortiz 10/29/90

N. R. Ortiz, ES&H Program Manager

1. Project Summary

Purpose

Support the ES&H Improvement and Compliance Program in performing a Pre-Tiger Team Self-Assessment (PTTSA) of Sandia National Laboratories, Albuquerque (including Tonopah Test Range and the Kauai Test Facility). Specific tasks for the SAWG are defined in Section 2 below.

Approach

Sample the ES&H compliance posture (in the Environmental, Health, and Safety, OSHA, and Management Practices program areas) utilizing findings survey forms and discussions with line organizations. Prepare action plans based on these findings. Consolidate action plans and generate key findings and root causes. Incorporate all of the above into the Self-Assessment Final Report.

Customers

ES&H Program Manager, Nestor Ortiz.

Schedule Highlights

Start October 8; submit draft of Self-Assessment report by December 17.

Risk

There is risk that the sampling approach utilized to collect findings could result in failure to identify some areas of noncompliance. This risk is compounded by the lack in in-depth ES&H experience on the part of the majority of the SAWG members. Nonetheless, the overall risk is judged to be moderate and acceptable given the tight schedule constraints.

Membership

The Self-Assessment Working Group (SAWG) is composed of the following persons:

J.K. Rice
D.W. Schaefer
M.W. Callahan
C.F. Gibbon
R.P. Kelly
D.G. Hoffman
R.J. Park
W.C. Nickell
J.R. Kelsey
D.A. Dahlgren
J.T. Holmes
J.L. Ledman

T.J. Hoban
K.D. Harper
G.H. Mauth
M.J. Navratil
W.D. Burnett
G.J. Smith
H. Crass
E.D. Graham, Jr., Coordinator

2. **Task Description and Schedule**

Support provided by the SAWG for the PTTSA process will consist of accomplishment of the tasks identified in Figure 1. Completion dates for each task are also shown.

3. **Organization**

The organizational structure for the SAWG is shown in Figure 2.

4. **Revisions**

Any/all changes to this document must be reviewed by R.W. Lynch and approved by N.R. Ortiz and the SAWG (as represented by its Coordinator, E.D. Graham, Jr.) The contents of each revision, dated, and approved, will become permanent additions to this document.

Distribution:	20E	R.W. Lynch
	3200	N.R. Ortiz
	SAWG	J.K. Rice
		D.W. Schaefer
		M.W. Callahan
		C.F. Gibbon
		R.P. Kelly
		D.G. Hoffman
		R.J. Park
		W.C. Nickell
		J.R. Kelsey
		D.A. Dahlgren
		J.T. Holmes
		J.L. Ledman
		T.J. Hoban
		K.D. Harper
		G.H. Mauth
		M.J. Navratil
		W.D. Burnett
		E.D. Graham, Jr.
		G.J. Smith
		W.D. Burnett
		H. Crass

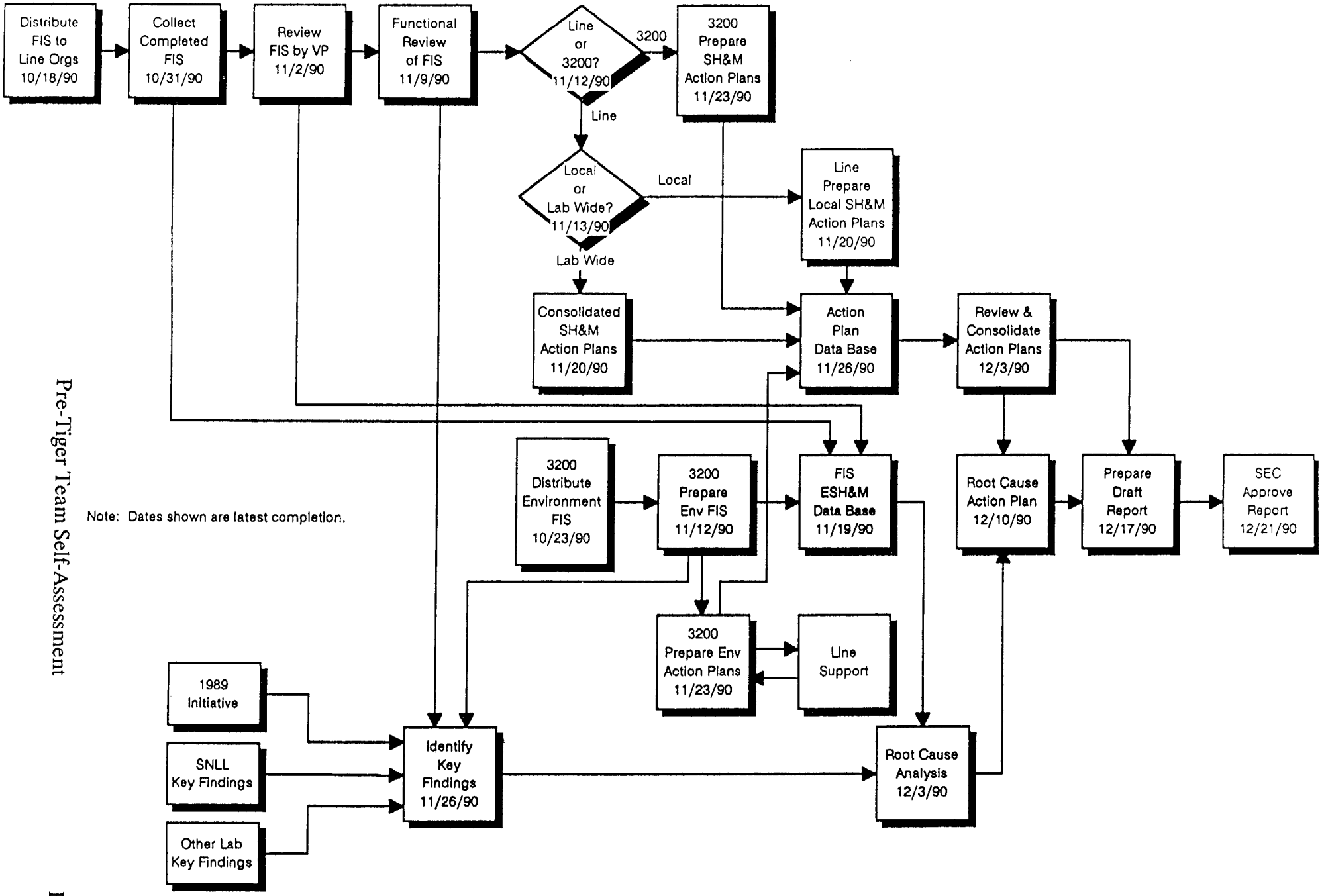


Figure 1.
Process Diagram for SAWG Preparation of Pre-Tiger Team Self Assessment Report

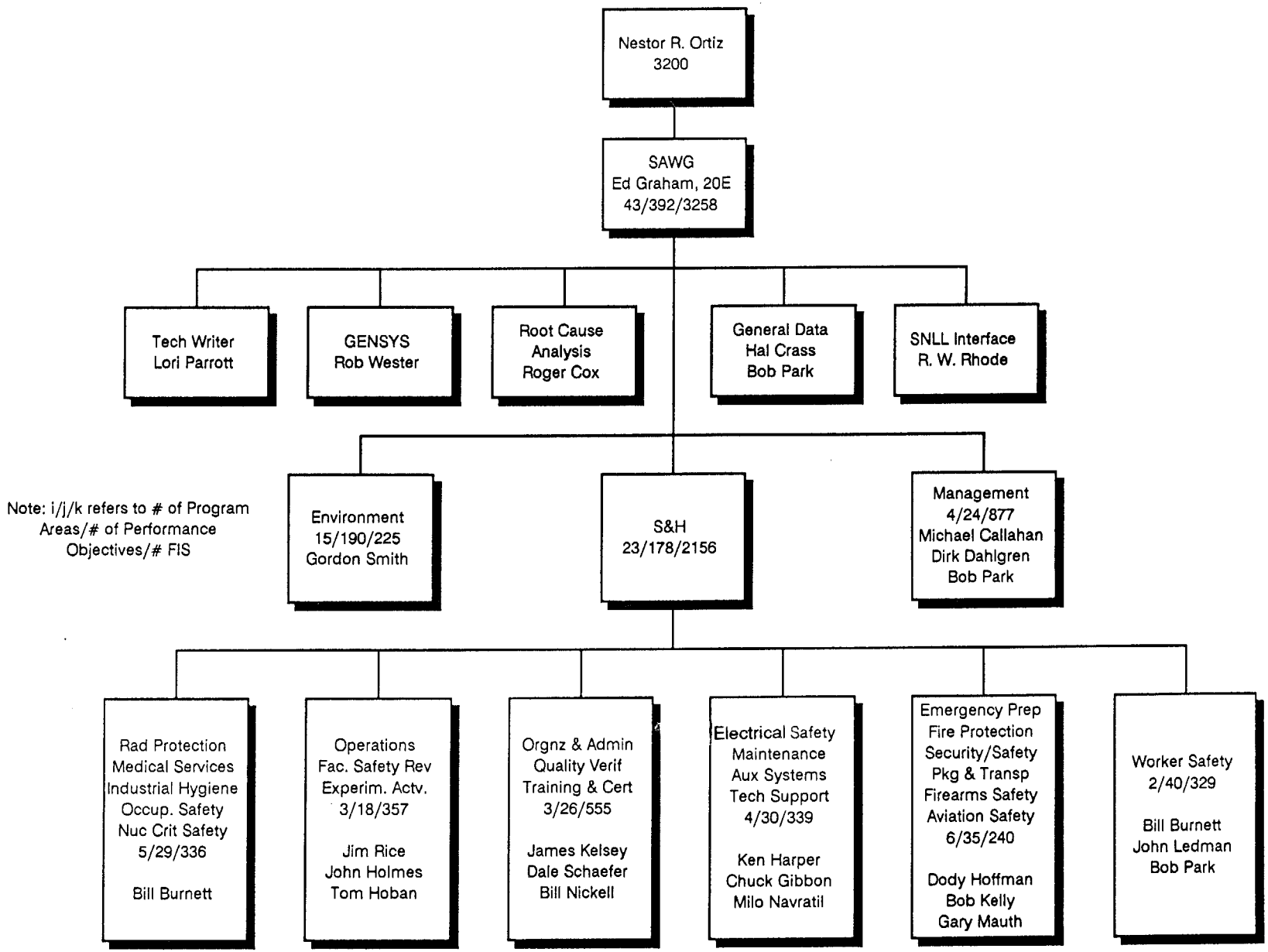


Figure 2
Self Assessment Working Group Organization

Appendix C
Abbreviations

Appendix C

Abbreviations and Acronyms

A/E	architectural/engineering
AA/EEO	Affirmative Action/Equal Employment Opportunity
ACRR	Annular Core Research Reactor
ALARA	as low as reasonably achievable
AMM	Automated Maintenance Management
ANSI	American National Standards Institute
APR	action plan requirement
AQCR	Albuquerque/Bernalillo County Air Quality Control Regulations
AS	aviation safety (program area)
ASL	above sea level
ASME	American Society of Mechanical Engineers
AT&T	American Telephone & Telegraph
AVS	American Vacuum Society
AWS	American Welding Society
AX	auxiliary systems (program area)
C	CERCLA (program area)
CA	clean air (program area)
CAA	Clean Air Act
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CS	nuclear criticality (program area)
CW	clean water (program area)
CWA	Clean Water Act
CWL	Chemical Waste Landfill
D&I	development and implementation
DEL	Defense Engineering Laboratory
DER	designated engineering representative
DOA	Department of Agriculture
DoD	Department of Defense
DOE	Department of Energy
DOE/AL	Department of Energy Albuquerque Operations
DOELAP	Department of Energy Laboratory Accreditation Program
DOL	Department of Labor
DOT	Department of Transportation
EA	experimental activities (program area)
ECF	Explosives Component Facility
EDM	electrical discharge machining
EH	environmental health
EMP	Environmental Monitoring Plan
ENV	environmental protection (program area)
EO	executive order
EOC	Emergency Operations Center
EP	emergency preparedness (program area)
EPA	Environmental Protection Agency
EPIP	Environmental Protection Implementation Plan

ERP	Environmental Restoration Program
ES	electrical safety (program area)
ES&H	environment, safety, and health
ESHSAC	Environment, Safety, and Health Self-Assessment Committee
FAA	Federal Aviation Administration
FCR	Facility Customer Representative
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
FIS	findings input sheet
FP	fire protection (program area)
FR	site/facility safety review (program area)
FS	firearms safety (program area)
GAO	Government Accounting Office
GIDEP	Government Industry Data Exchange Program
GOCO	Government-owned, Contractor-operated
GW	groundwater (program area)
HazCom	Hazards Communication
HCF	Hot Cell Facility
HEPA	high efficiency particulate air (filter)
HMS	hazardous materials storage (program area)
HMT	hazardous materials transportation (program area)
HMTA	Hazardous Materials Transportation Act
HSWA	Hazardous and Solid Waste Amendments
I/O	inspector/observer
ICBM	intercontinental ballistic missile
ICD	interface control document
IH	industrial hygiene (program area)
INPO	Institute of Nuclear Power Operations
JIT	just-in-time
KAFB	Kirtland Air Force Base
KF	key finding
KTF	Kauai Test Facility
LEPC	Local Emergency Planning Committee
M&O	management and operating
MA	maintenance (program area)
MC	management controls (program area)
MC&A	Material Control and Accountability
MILCON	Military Construction
MinNet	Waste Minimization Network
MOU	memorandum of understanding
MQ	management qualifications (program area)

MS	medical services (program area)
MSDS	Material Safety Data Sheet
MSR	Maintenance Service Requests
MTB	Materials Transportation Bureau
MWL	Mixed Waste Landfill
MY	management systems (program area)
NCP	National Contingency Plan
NE	natural and cultural resources (program area)
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NFPA	National Fire Protection Association
NMEID	New Mexico Environmental Improvement Division
NPDES	National Pollutant Discharge Elimination System
NPL	National Priority List
NQA	nuclear quality assurance
NSPS	New Source Performance Standards
NV	Nevada Operations
OA	organization and administration (program area)
OP	operations (program area)
OR	organization (program area)
OS	occupational safety (program area)
OSHA	Occupational Safety and Health Administration
PASO	Pacific Area Support Office
PBFA-II	Particle Beam Fusion Accelerator II
PCB	polychlorinated biphenyl
PHA	preliminary hazard analysis
PMRF	Pacific Missile Range Facility
POTW	Publicly Owned Treatment Works
PP	personnel protection (program area)
PQMI	Process Quality Management Improvement
PR	personnel (program area)
PTTSA	Pre-Tiger Team Self-Assessment
QA	quality assurance (program area)
QC	quality control (program area)
QIP	Quality Improvement Plan
QV	quality verification (program area)
R	RCRA (program area)
RA	radiation (program area)
R&D	research and development
RCRA	Resource Conservation and Recovery Act
RCSC	Area V Radiological and Criticality Safety Committee
REECO	Reynolds Electrical and Engineering Company
RF	radio frequency

RIM	records and information management
RMW	radioactive and mixed waste (program area)
RMWMF	Radioactive and Mixed Waste Management Facility
RP	radiological protection (program area)
RQ	Reportable Quantity
RSN	Raytheon Service Nevada
RWP	radiation work permit
S&H	safety and health (program area)
SA	safety assessment
SAR	safety analysis report
SARA	Superfund Amendments and Reauthorization Act
SAWG	Self-Assessment Working Group
SB	soil/sediment biota (program area)
SD	Safe drinking water (program area)
SDIO	Strategic Defense Initiative Organization
SDWA	Safe Drinking Water Act
SERC	State Emergency Response Commission
SF	significant finding
SHEAC	Safety, Health, and Environmental Appraisal Committee
SLI	Sandia Laboratories Instruction
SNCSC	Sandia Nuclear Criticality Safety Committee
SNL	Sandia National Laboratories
SOP	safe operating procedure
SPCC	Spill Prevention, Control, and Countermeasures
SPR	Sandia Pulsed Reactor
SRCSC	Sandia Radiological and Criticality Safety Committee
SS	security/safety interface (program area)
STARS	Strategic Target System
T	TSCA (program area)
TC	training and certification (program area)
TOP	traffic operating procedures
TRL	Tritium Research Laboratory
TRU	transuranic waste
TS	technical support (program area)
TSA	Technical Safety Appraisal (Manual)
TSCA	Toxic Substances Control Act
TTR	Tonopah Test Range
UBC	Uniform Building Code
UOR	unusual occurrence report
USAF	United States Air Force
USDOE	US Department of Energy
UST	underground storage tank
VOC	volatile organic compound
VP	vice president

WAC	Waste Acceptance Criteria
WIPP	Waste Isolation Pilot Plant
WPPSL	Weapons Production Primary Standards Laboratory
WS	worker safety (program area)

Appendix D
Performance Objectives

Appendix D

List of Program Areas and Performance Objectives

AS.01 Organization and Administration

Organization, administration, and safety programs should ensure the provision of proper aircraft, facilities, and effective implementation and control of aviation and associated safety activities.

AS.02 Operations

Operations should be provided the administrative support, publications, equipment, and training to maintain knowledge and skills to conduct the aviation mission safely in accordance with DOE and FAA standards.

AS.03 Maintenance

Maintenance should ensure safe operations and control of maintenance activities, and that these activities are conducted in a safe, accountable manner, following DOE and FAA standards, procedures, and accepted practices to support each facility condition and operation.

AS.04 Life Support Equipment

The life support program should provide the equipment and training to ensure air crew members and passengers a safe flight environment, and afford the means to reliable descent, survival, and recovery in an emergency situation.

AS.05 Physical Security

Physical security of equipment and facilities, including aircraft, aircraft maintenance areas, and access to administrative offices should be included in all plans and policies.

AS.06 Operating Experience

Operating experience should be evaluated, and appropriate action taken to improve safety and reliability of aircraft and crew members.

AX.01 Systems Requirements

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.

AX.02 Effluent Holdup and Treatment

Effluent holdup and treatment should ensure that the amount of hazardous substances released to the environment as escaping emissions and/or as effluent gaseous or liquid releases are less than DOE and EPA standards and are ALARA.

AX.03 Solid Wastes

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.

AX.04 Storage and Handling of Fissile Material

Fissile material should be stored and handled in a manner which minimizes the chances of loss, contamination, release, or inadvertent criticality.

AX.05 Ventilation Systems

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.

AX.06 Vital Supply Systems

The electric, water, and emergency power systems should reliably provide vital services as required by all facilities on the site.

AX.07 Heat Removal Systems

The heat removal systems should reliably remove heat as required from the reactor or process and equipment important to safety.

AX.08 Engineered Safety Systems

Engineered safety systems should be reliable and available to provide protection to the facility when required.

AX.09 Coolant Cleanup Systems

Recirculating coolants should be cleaned continuously or intermittently to minimize the buildup of contamination and reduce corrosion.

CS.01 Organization and Administration

All operations with fissionable material should be conducted to provide effective nuclear criticality control during all activities.

CS.02 Use Of Nuclear Criticality Safety Control Parameters

Nuclear criticality safety should be achieved by controlling one or more specified parameters of the system within subcritical limits.

CS.03 Nuclear Criticality Safety Evaluations

Nuclear criticality safety evaluations of the design an operation of process equipment should ensure that subcriticality is maintained under normal and credible abnormal operating conditions.

CS.04 Operating Procedures and Criticality Safety Limits

The approved written operating procedures should address criticality safety limits in providing effective guidance for all aspects of facility activities.

CS.05 Criticality Alarm System and Emergency Procedures

All reasonable steps should be taken to mitigate the consequences of a nuclear criticality accident.

EA.01 Interface With Experimenters

Persons planning or conducting experiments in or with the facility should have their relationship to the operating group clearly defined.

EA.02 Experiment Categories

All proposed experiments should be approved by an independent Safety Review Committee before they are performed.

EA.03 Experiment Proposals

Sufficient information on a proposed experiment should be submitted to permit a safety evaluation to be made.

EA.04 Operation of Experiments

Experiments performed in any facility on the site should not present undue risk or significantly increase the risk previously evaluated for the facility or the site.

EP.01 Organization and Administration

Emergency preparedness organization and administration should ensure effective planning for, and implementation and control of, site/facility emergency response.

EP.02 Emergency Plan and Implementing Procedures

The emergency plan, the emergency plan implementing procedures, and their supporting documentation should provide for effective response to operational emergencies.

EP.03 Emergency Response Training

Emergency response training should develop and maintain the knowledge and skills for emergency personnel to respond to and control an emergency effectively.

EP.04 Emergency Preparedness Drills and Exercises

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.

EP.05 Emergency Facilities, Equipment, and Resources

Emergency facilities, equipment, and resources should adequately support site/facility emergency operations.

EP.06 Emergency Assessment and Notification

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.

EP.07 Personnel Protection

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.

ES.01 Administrative Controls

Line management should ensure effective implementation of the various site electrical safety programs, as well as ensure compliance with all applicable codes, standards, and regulations (National Electrical Code; National Electrical Safety Code; DOE Order 6430.1A; 29 CFR 1910, Subpart S; and 29 CFR 1926, Subparts K and V).

ES.02 Electrical Worker Qualification and Training

Line management should develop and be responsible for formal training and qualification of all electrical workers before they are permitted to perform electrical work.

ES.03 Conduct of Electrical Work

Electrical work shall be conducted in a safe and effective manner.

ES.04 Safety Program Documentation

Records should be available to track the electrical safety record of contractors and subcontractors.

ES.05 Safety Equipment

Safety equipment, as required, shall be provided, and procedures established for its use and care. Management shall assure proper use of all protective equipment.

ES.06 Preventive Maintenance

Management should develop an Electrical Preventive Maintenance (EPM) program that will ensure that all electrical equipment will function as designed and installed. The program should be based on the manufacturer's recommendations and the recommendations of NFPA-70B.

FP.01 Organization and Administration

Fire Protection organization and administration should ensure the effective implementation and control of fire protection equipment and activities.

FP.02 Life Protection

All facilities onsite should provide adequate life safety provisions against the effects of fire.

FP.03 Public Protection

All facilities onsite should provide adequate protection to prevent any added threat to the public as the result of an onsite fire causing the release of hazardous materials beyond the site (or facility) boundary.

FP.04 Impairment of Operations

The site should not be vulnerable to being shut down for an unacceptable period as the result of a credible fire.

FP.05 Property Protection

A maximum credible fire, as defined in DOE 5480.7, Section 6.f, should not result in an unacceptable property loss.

FP.06 Fire Department Operations

The Fire Department should have the capacity to promptly terminate and mitigate the effects of a fire in a safe and effective manner.

FP.07 Program Implementation

A fire protection engineering program should be in place to effectively provide and maintain an "improved risk" level of fire protection.

FR.01 Safety Review Committee

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 Orders 5480.5, or 5480.6, and/or 5482.1B, Section 9.d.

FR.02 Safety Review Topics

Items that require review by the Safety Review Committee should be well defined and understood by facility management.

FR.03 Operation of Safety Review Committee

Review of site/facility activities by the Safety Review Committee should ensure achievement of a high degree of safety.

FR.04 Annual Facility Safety Review

An annual operating review of the facility should be performed by a committee appointed by top contractor management as specified in DOE Orders 5480.5 and 5480.6.

FR.05 Triennial Appraisal of Site/Facility Safety Review System

A triennial appraisal of the safety review system should be performed by contractor management.

FR.06 Operating Experience Review

Operating experiences should be evaluated, and appropriate actions should be undertaken to improve safety and reliability.

FS.01 Organization and Administration

Security and safety organization and administration should ensure the effective implementation and control of the firearms safety program.

FS.02 Procedures and Documentation

Procedures and documentation should provide appropriate direction, record generation, and support for the firearms safety program.

FS.03 Firearms Safety Appraisal Program

Annual formal appraisals are conducted by safety personnel or a joint safety/security appraisal team.

FS.04 Firearms Safety Training

Firearms safety training programs have been established and implemented to ensure compliance with DOE-prescribed standards.

FS.05 Range Operations and Procedures

Firearms range operations and procedures are in compliance with DOE requirements.

FS.06 Force-On-Force Exercises

Force-on-force operations should be conducted in an approved safe manner with all identified hazards analyzed and mitigated.

FS.07 Transportation, Handling, and Storage of Munitions

The transportation, handling, and storage of munitions should conform to all DOE-prescribed safety standards.

IH.01 Organization and Administration

Site and facility organization and administration should ensure effective implementation and control of the industrial hygiene program.

IH.02 Procedures and Documentation

Procedures and documentation should provide appropriate direction, record generation, and support for the industrial hygiene program.

IH.03 Management of Health Concerns

Chemical, biological, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

IH.04 Surveillance of Health Concerns

Appropriate surveillance of activities should be conducted to measure industrial hygiene performance and ensure the continued effectiveness of controls.

IH.05 Compliance With Occupational Safety Standards

Site/facility operations comply with DOE-prescribed standards for the evaluation and control of occupational health standards.

IH.06 Personnel Communication Program

Site/facility personnel should be adequately informed of chemical and biological stresses that may be encountered in their work environment.

MA.01 Organization and Administration

Maintenance organization and administration should ensure effective implementation and control of maintenance activities.

MA.02 Conduct of Maintenance

Maintenance should be conducted in a safe and effective manner to support each facility condition and operation on the site.

MA.03 Maintenance Facilities, Equipment, and Material

Facilities, equipment, and material should effectively support the performance of maintenance activities.

MA.04 Planning, Scheduling, and Work Control

The planning, scheduling, and control of work should ensure that identified maintenance actions are properly completed in a safe, timely, and effective manner.

MA.05 Corrective Maintenance

The material condition of components and equipment should be maintained to support safe and effective operation of all facilities on the site.

MA.06 Preventive Maintenance

Preventive maintenance should contribute to optimum performance and reliability of systems and equipment important to operations.

MA.07 Predictive Maintenance

Maintenance history evaluation and systematic root cause analyses should be used to support maintenance activities and optimize equipment performance.

MA.08 Procedures and Documentation

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.

MS.01 Organization and Administration

Site and facility organization and administration should ensure effective implementation and control of the medical services program.

MS.02 Procedures and Documentation

Procedures and documentation should provide appropriate direction, record generation, and support of the medical services for the facility and site.

MS.03 Medical Treatment

Medical treatment should be available and provided by qualified, competent staff, and adequate facilities should be available.

MS.04 Review and Audit

Policies, procedures and practices for medical services should be reviewed and audited periodically to ensure continued effectiveness of the medical services.

MS.05 Personnel Communication Program

Site/facility personnel should be adequately informed of the medical hazards that may be encountered and of the medical services that are available.

OA.01 Site/Facility Organization

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.

OA.02 Administration

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

OA.03 Management Objectives

Site/facility management objectives should ensure commitment to safe operation, including enforcement of approved work practices and procedures.

OA.04 Corporate Support

Corporate interest and support for safe operation should be evident.

OA.05 Management Assessment

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

OA.06 Personnel Planning and Qualification

Personnel programs should ensure that appropriate job qualification requirements or position descriptions are established for all positions that affect safe and reliable operation.

OA.07 Document Control

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

OA.08 Fitness-for-Duty

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.

OP.01 Organization and Administration

Operations organization and administration should ensure effective implementation and control of operations activities.

OP.02 Conduct of Operations

Operational activities should be conducted in a manner that achieves safe and reliable operation.

OP.03 Operations Procedures and Documentation

Approved written procedures, procedure policies and datasheets should provide effective guidance for normal and abnormal operation of each facility on a site.

OP.04 Facility Status Controls

Operations personnel should know the status of the systems and equipment under their control, should know the effect of nonoperational systems and equipment on continued operations. They should ensure that systems and equipment are controlled in a manner that supports safe and reliable operation.

OP.05 Operations Stations and Equipment

Operation stations and facility equipment should effectively support facility operation.

OP.06 Operator Knowledge and Performance

Operator knowledge and performance should support safe and reliable operation of the equipment and systems for which they are responsible.

OP.07 Shift Turnover

Turnovers conducted for each shift station should ensure the effective and accurate transfer of information between shift personnel.

OP.08 Human Factors

Human factors considerations should be incorporated in the design, layout and operation of all facilities on the site in order to facilitate operator control, information processing, and the recognition and proper response to alarms, instruments, and other equipment.

OS.01 Organization and Administration

Site and facility organization and administration should ensure effective implementation and control of the occupational safety program.

OS.02 Procedures and Documentation

Procedures and documentation should provide appropriate direction, record generation, and support for the occupational safety program.

OS.03 Management of Safety Concerns

Physical and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

OS.04 Surveillance of Safety Concerns

Appropriate surveillance of activities should be conducted to measure safety performance and ensure the continued effectiveness of controls.

OS.05 Compliance with Occupational Safety Standards

Work places should be free of uncontrolled physical safety concerns and be in compliance with DOE-prescribed occupational safety standards.

OS.06 Personnel Communication Program

Site/facility personnel should be adequately informed of physical stresses that may be encountered in their work environment.

PP.01 Organization and Administration

Site and facility organization ad administration should ensure effective implementation of the personnel protection program.

PP.02 Procedures and Documentation

Procedures and documentation should provide appropriate direction, record generation, and support for the personnel protection program.

PP.03 Management of Health and Safety Concerns

Chemical, physical, and/or other environmental stresses arising in the workplace should be identified, evaluated, and controlled.

PP.04 Surveillance of Health and Safety Concerns

Appropriate surveillance of activities should be conducted to measure safety and health performance and ensure the continued effectiveness of controls.

PP.05 Compliance With Occupational Health Standards

Site/facility operations should comply with DOE- prescribed standards for the evaluation and control of occupational health standards.

PP.06 Compliance with Occupational Safety Standards

Work places should be free of uncontrolled physical hazards and be in compliance with DOE-prescribed occupational safety standards.

PP.07 Personnel Communication Program

Site/facility personnel should be adequately informed of chemical, physical, and biological stresses that may be encountered in their work environment.

PT.01 Administration and Organization

Management should develop and implement a system of policies and directives that will provide for effective implementation of DOE Orders, particularly DOE Order 5480.3, Federal and state regulations, and good industrial practices in operations involving packaging and transportation of hazardous materials.

PT.02 Training

Personnel should be trained, qualified, and certified in handling hazardous materials as required by DOE Order 5480.3 and 29 CFR.

PT.03 Quality Assurance

A system of checks and balances should exist that ensures the quality assurance (QA) requirements of the applicable DOE Orders and ANSI NQA-1-1986 are met.

PT.04 Regulatory Compliance

All packaging and transportation operations involving hazardous materials should be conducted in compliance with the applicable state and Federal regulations, including those of the Department of Transportation (DOT), Nuclear Regulatory Commission (NRC), Occupational Safety and Health Administration (OSHA), and Environmental Protection Agency (EPA).

PT.05 Accidents and Incidents

Accidents and incidents involving packaging and transportation of hazardous materials should be reported in a timely manner to the DOE.

PT.06 Operations

Sitewide operations involving packaging and transportation of hazardous materials should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted practices.

PT.07 Intra-Building Movements

Intra-building movements and en route storage operations should be conducted in a safe, consistent, and accountable manner, following approved procedures, in conformance with applicable standards and accepted practices.

PT.08 Onsite Transfers

Onsite transfers of hazardous materials should be conducted in a safe, consistent, and accountable manner,following approved procedures, in conformance with applicable standards and accepted safety practices.

PT.09 Offsite Shipments

Offsite shipments of hazardous material should be conducted in a safe, consistent, and accountable manner,following approved procedures, in conformance with applicable regulations, standards, and accepted practices.

PT.10 Records

Records of hazardous materials movements, transfers, and shipments should be prepared and maintained to ensure compliance with DOE and other regulatory requirements, and to provide an auditable trail of actions.

QV.01 Quality Programs

Administrative programs and controls should be in place to ensure policies concerning quality are administered for each facility throughout the site.

QV.02 Procurement and Supplier Control

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

QV.03 Receiving and Pre-Installation Inspections

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

QV.04 Calibration Program

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.

QV.05 Identification and Control of Hardware/Materials

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.

QV.06 Inspections

Prerequisites should be provided in written inspection procedures with provisions for documenting and evaluating inspection results.

QV.07 Control of Special Processes

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.

RP.01 Organization and Administration

Site/facility organization and administration should ensure effective implementation and control of radiological protection activities on the site/facility.

RP.02 Internal Audits and Investigations

The internal audit program for both routine operations and unusual radiological occurrences should provide adequate performance assessments.

RP.03 Radiological Protection Procedures and Posting

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.

RP.04 External Radiation Exposure Control Program

External radiation exposure controls should minimize personnel radiation exposure.

RP.05 External Radiation Dosimetry

The routine and accident personnel radiation dosimetry programs should ensure that personnel radiation exposures are accurately determined and recorded.

RP.06 Internal Radiation Exposure Control Program

Internal radiation exposure controls should minimize internal exposure.

RP.07 Internal Radiation Dosimetry

The internal radiation dosimetry program should ensure that personnel radiation exposures are accurately determined and recorded.

RP.08 Fixed and Portable Instrumentation

Personnel dosimetry and radiological protection instrumentation used to obtain measurements of radioactivity should be calibrated, used, and maintained so that results are accurately determined.

RP.09 Air Monitoring

Air monitoring systems through selection, location, calibration, and maintenance should ensure reliable estimates of air activity for radiological control purposes.

RP.10 Radiation Monitoring/Contamination Control

The radiation monitoring and contamination control program should ensure worker protection from radiation exposures.

RP.11 ALARA Program

A formally structured, auditable program should be in place with established milestones to ensure that exposures are maintained as low as reasonably achievable(ALARA).

RP.12 Records

Records related to occupational exposure should be maintained in a manner that permits easy retrievability,allows trend analysis, and aids in the protection of an individual and control of radiation exposure.

SS.01 Safety of Improvements

Security/safeguards improvements and modifications should not create or increase hazards that would impede the safe, reliable operation or shutdown of any facility on the site in normal, abnormal, or emergency situations.

SS.02 Emergency Access and Egress

Authorized facility and safety support personnel should not be denied access in an emergency. Egress during emergencies should be conducted according to approved preplanning.

SS.03 Facility Planning for Security/Safeguards Emergencies

Safety authorities and responsibilities for all types of security/safeguards emergencies should be well defined and understood by all involved parties.

SS.04 Safety of Security Activities

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.

TC.01 Organization and Administration

The training organization and administration should ensure effective implementation and control of training activities.

TC.02 Reactor Operations

The operator and reactor supervisor training and certification programs should be based on DOE Order 5480.6, Section 8.e, as applicable, and should develop and improve the knowledge and skills necessary to perform assigned job functions.

TC.03 Nuclear Facility Operations Other Than Reactors

The nuclear facility operator and supervisor training and certification programs should be based on DOE Order 5480.5, as applicable, and should develop and improve the knowledge and skills necessary to perform assigned job functions. (Nuclear Facilities Only)

TC.04 General Employee/Personnel Protection Training

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.

TC.05 Maintenance Personnel

The maintenance personnel training qualification programs should develop and improve the knowledge and skills necessary to perform assigned job functions.

TC.06 Criticality Safety

Personnel should receive training in nuclear criticality safety consistent with their assigned tasks. (Reactors and Nuclear Facilities Only).

TC.07 Training Facilities and Equipment

The training facilities, equipment, and materials should effectively support training activities.

TC.08 Quality Control Inspector and Nondestructive Examination Technician

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.

TC.09 Radiological Protection Personnel

The radiological protection personnel training and qualification program should develop and improve the knowledge and skills necessary to perform assigned job functions.

TC.10 Training For Supervisors, Managers, and Technical Staff

Training programs for supervisors, managers, and the technical staff should broaden overall knowledge of processes and equipment, and develop supervisory and management skills.

TC.11 Simulator Training/Facility Exercises

Simulator training and/or facility exercises should be conducted utilizing methods and techniques that are effective in developing and maintaining team and individual knowledge and skills in responding to abnormal and emergency events, and in integrated operations. (Reactors and Nuclear Facilities Only)

TS.01 Organization and Administration

The technical support organization and administration should ensure effective implementation and control of technical support activities.

TS.02 Procedures and Documents

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.

TS.03 Facility Modifications

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.

TS.04 Equipment Performance Testing and Monitoring

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.

TS.05 Environmental Impact

The impact on the environs from the operation of each facility on the site should be minimized.

TS.06 Packaging and Transportation of Hazardous Materials

Performance of the packaging and transportation (PT) functions should ensure conformance with existing standards and accepted practices as given in DOE Order 5480.3, and other DOE orders and Federal regulations.

TS.07 Reactor Engineering

Reactor engineering activities should ensure optimum nuclear reactor operation without compromising design, safety, or nuclear fuel limits. (Reactors only)

TS.08 Criticality Safety

Specialized support for criticality safety issues should be fully integrated into the operation of the reactor, and the handling and storage of fuel by facility personnel. (Reactors only)

WS.01 Industrial Medical and Exposure Records

Workplaces are in compliance with Occupational Safety and Health Administration General Industry medical and exposure records regulation 29 CFR 1910, Subpart C, General Safety and Health Provisions. Workplace exposure monitoring and medical records are kept, and employees and their designated representatives have access. Medical and exposure records are kept separate from

other personnel records, and are preserved and maintained for a period of thirty years.

WS.02 Industrial Walking and Working Surfaces

Workplaces are in compliance with Occupational Safety and Health Administration General Industry walking and working surfaces regulation 29 CFR 1910, Subpart D, Walking and Working Surfaces. Workplaces have walking and working surfaces which are structurally sound, in good repair, and do not present tripping and falling hazards to employees. Floor and wall openings are guarded, and ladders and platforms meet requirements.

WS.03 Industrial Means of Egress

Workplaces are in compliance with Occupational Safety and Health Administration General Industry means of egress regulation 29 CFR 1910, Subpart E, Means of Egress. All means of egress are continuous and unobstructed to a way of exit from any point in a building or structure. A one-hour fire separation for the egress is provided at all times and the egress meets all regulatory requirements.

WS.04 Industrial Powered Platforms, Manlifts, and Vehicle Work Platforms

Workplaces are in compliance with Occupational Safety and Health Administration General Industry powered platform, manlift and vehicle mounted work platform regulation 29 CFR 1910, Subpart F, Powered Platforms, Manlifts, and Vehicle-Mounted Work Platforms. Powered platforms for exterior building maintenance, vehicle-mounted elevating and rotating platforms, and manlifts meet the regulations and are regularly inspected.

WS.05 Industrial Occupational Health and Environmental Controls

Workplaces are in compliance with Occupational Safety and Health General Industry occupational health and environmental control regulation 29 CFR 1910, Subpart G, Occupational Health and Environmental Control. Ventilation systems for industrial processes meet design and performance criteria, noise exposures are maintained within limits, and ionizing and nonionizing radiation are below allowable limits.

WS.06 Industrial Hazardous Materials

Workplaces are in compliance with OSHA General Industry regulation 29 CFR 1910, Subpart H. Compressed gasses are properly handled and stored. Flammable and combustible liquids are properly handled and stored, and spray finishing with flammable and combustible materials is conducted according to regulations. Explosives and blasting agents are stored, used and handled according to regulations as is the storage, handling and use of LP gases.

WS.07 Industrial Personal Protective Equipment

Workplaces are in compliance with Occupational Safety and Health Administration General Industry personal protective regulation 29 CFR 1910, Subpart I, Personal Protective Equipment. Personal protective equipment is provided, maintained and used for eyes, head, face, and extremities, as well as respiratory protection, as required by regulations.

WS.08 Industrial General Environmental Controls

Workplaces are in compliance with Occupational Health and Safety General Industry general environmental control regulation 29 CFR 1910, Subpart J. Workplaces are sanitary, temporary labor camps are established and maintained properly, physical hazards are safety color- coded, and accident prevention signs meet regulations.

WS.09 Industrial Medical and First Aid

Workplaces will be in compliance with Occupational Safety and Health Administration General Industry medical and first aid regulation 29 CFR 1910, Subpart K. Medical services and first aid are available as required by regulations.

WS.10 Industrial Fire Protection

Workplaces are in compliance with OSHA General Industry fire protection regulation 29 CFR 1910, Subpart L. Fire hazards are identified in workplaces, fire brigades are established where appropriate, and proper portable fire extinguishers are installed and maintained. Standpipe and hose systems are installed and properly maintained as are automatic sprinkler systems, dry chemical, water spray and foam fixed extinguishing systems, and fire detection systems.

WS.11 Industrial Compressed Gasses

Workplaces are in compliance with Occupational Safety and Health Administration General Industry compressed gas and compressed air equipment regulation 29 CFR 1910, Subpart M, Compressed Gas and Compressed Air Equipment. Air receivers will be designed, built and maintained as required by regulation.

WS.12 Industrial Materials Handling and Storage

Workplaces are in compliance with OSHA General Industry materials handling and storage regulation 29 CFR 1910, Subpart N. Mechanical handling of materials is done in a safe manner. Powered industrial trucks, overhead and gantry cranes, crawler locomotive and truck cranes, and derricks are maintained and operated according to regulations. Slings are properly sized for loads, and are maintained in a safe operating condition.

WS.13 Industrial Machinery and Machine Guarding

Workplaces are in compliance with OSHA General Industry regulation 29 CFR 1910, Subpart 0. All machinery and machines requiring guarding to provide safe working conditions are guarded as required by regulations. These regulations provide general requirements for all machines, woodworking machinery, abrasive wheel machinery, mechanical power presses, forging machines, and mechanical power-transmission apparatus.

WS.14 Industrial Hand and Power Tools

Workplaces are in compliance with Occupational Safety and Health Administration General Industry hand and portable powered tools and other hand-held equipment regulation 29 CFR 1910, Subpart N. The general requirements are met and portable tools are properly guarded.

WS.15 Industrial Welding, Cutting and Brazing

Workplaces are in compliance with OSHA General Industry welding, cutting and brazing regulation 29 CFR 1910, Subpart Q. Welding, cutting and brazing is conducted as required by regulations. Fuel gasses are used and stored properly, exposure to toxic fumes and vapors is below permissible limits, adequate ventilation is provided, and work in confined spaces is conducted according to regulations.

WS.16 Industrial Special Industries

Workplaces are in compliance with Occupational Safety and Health General Industry special industries regulation 29 CFR 1910, Subpart R, Special Industries. When applicable, requirements for pulp, paper and paperboard mills, laundry machinery and operations, sawmills, pulpwood logging and telecommunications regulations will be met.

WS.17 Industrial Electrical

Workplaces are in compliance with Occupational Safety and Health Administration General Industry electrical regulation 29 CFR 1910, Subpart 5, Electrical. All electrical equipment and installations meet the applicable regulations.

WS.18 Industrial Commercial Diving Operations

Workplaces are in compliance with Occupational Safety and Health Administration General Industry commercial diving operations regulation 29 CFR 1910, Subpart T, Commercial Diving Operations. Diving team members are qualified, diving procedures are followed, proper equipment is provided and maintained, and recordkeeping procedures are followed as required by regulations.

WS.19 Industrial Toxic and Hazardous Substances

Workplaces are in compliance with OSHA General Industry regulation 29 CFR 1910, Subpart Z. Employees and workplaces are monitored and employee exposures are kept below the Permissible Exposure Limits for air contaminants. Compliance is maintained with the asbestos requirements of 29 CFR 1910.1001 as well as with the requirements for hazard communication and exposure with the hazardous materials addressed in 29 CFR 1910.1002 through 1910.1101.

WS.20 Construction General Safety

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry general safety and health provisions 29 CFR 1926, Subpart C, General Safety and Health Provisions.

WS.21 Construction Environmental Control

Workplaces are compliance with Occupational Safety and Health Administration Construction Industry occupational health and environmental controls regulation 29 CFR 1926, Subpart D, Occupational Health and Environmental Controls.

WS.23 Construction Personal Protective Equipment

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry personal protective and life-saving equipment regulation 29 CFR 1926, Subpart E, Personal Protective and Life Saving Equipment.

WS.24 Construction Fire Protection

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry fire protection and prevention regulation 29 CFR 1926, Subpart F, Fire Protection and Prevention.

WS.25 Construction Signs, Signals, and Barricades

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry signs, signals and barricades regulation 29 CFR 1926, Subpart G, Signs, Signals, and Barricades.

WS.26 Construction Materials Handling

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry materials handling, storage, use, and disposal regulation 29 CFR 1926, Subpart H, Materials Handling, Storage, Use, and Disposal.

WS.27 Construction Hand and Power Tools

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry hand and power tool regulation 29 CFR 1926, Subpart I, Tools - Hand and Power.

WS.28 Construction Welding and Cutting

Workplaces are compliance with Occupational Safety and Health Administration Construction Industry welding and cutting regulation 29 CFR 1926, Subpart J, Welding and Cutting.

WS.29 Construction Electrical

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry electrical regulation 29 CFR 1926, Subpart K, Electrical.

WS.30 Construction Ladders and Scaffolds

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry ladders and scaffolding regulation 29 CFR 1926, Subpart L, Ladders, and Scaffolding.

WS.31 Construction Floor and Wall Openings

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry floor and wall opening, and stairway regulations 29 CFR 1926, Subpart M, Floor and Wall Openings, and Stairways.

WS.32 Construction Cranes, Hoists, and Conveyors

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry crane, derrick, hoist, elevator and conveyor regulation 29 CFR 1926, Subpart N, Cranes, Derricks, Hoists, Elevators, and Conveyors.

WS.33 Construction Vehicles, Equipment and Marine Operations

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry motor vehicle, mechanized equipment and marine operation regulation 29 CFR 1926, Subpart 0, Motor Vehicles, Mechanized Equipment, and Marine Operations.

WS.34 Construction Trenching and Shoring

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry excavation, trenching, and shoring regulation 29 CFR 1926, Subpart P, Excavations, Trenching, and Shoring.

WS.35 Construction Concrete and Masonry Construction

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry concrete and masonry construction regulation 29 CFR 1926, Subpart Q, Concrete and Masonry Construction.

WS.36 Construction Steel Erection

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry steel erection regulation 29 CFR 1926, Subpart R, Steel Erection.

WS.37 Construction Underground, Cofferdam, and Compressed Air

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry underground construction, caisson, cofferdam, and compressed air regulation 29 CFR 1926, Subpart S, Underground Construction, Caisson, Cofferdams, and Compressed Air.

WS.38 Construction Demolition

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry demolition regulation 29 CFR 1926, Subpart T, Demolition.

WS.39 Construction Blasting and Explosives

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry blasting and use of explosives regulation 29 CFR 1926, Subpart U, Blasting and Use of Explosives.

WS.40 Construction Power Transmission and Distribution

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry power transmission and distribution regulation 29 CFR 1926, Subpart V, Power Transmission and Distribution.

WS.41 Construction Rollover and Overhead Protection

Workplaces are in compliance with Occupational Safety and Health Administration Construction Industry rollover protective structures and overhead protection regulation 29 CFR 1926, Subpart W, Rollover Protective Structures; Overhead Protection.

MQ.01 Management Experience and Training

Managers are competent and have training and experience to meet qualifications for their assigned responsibilities.

MQ.02 Management Attitude, Involvement, and Commitment

Management attitude towards performance excellence is reflected in a commitment to corporate policy, knowledge of requirements, and direct and active involvement in activities related to ESH&QA.

MY.01 Planning, Budgeting, and Spending

ESH&QA programs are an integral part of the planning and budgeting process and receive the same consideration and priority as other operational activities.

MY.02 DOE and Regulatory Requirements Control

Environmental protection, safety, health, and quality assurance (ESH&QA) requirements--as defined by DOE in contracts, orders policies, standards, codes, directives, and regulations--are properly interpreted and implemented.

MY.03 Environmental Protection

Environmental protection facilities and practices reflect a dedication to preservation of the environment and comply with state and Federal regulations, and DOE orders and directives.

MY.04 Quality Assurance

Quality Assurance requirements for the ESH&QA programs are documented in a formalized Quality Assurance program or plan and are implemented.

MY.05 Self-Evaluation

Line managers exhibit an active interest in improving performance of their organizations in the ESH&QA areas and routinely evaluate performance and identify areas where improvement can be made.

MY.06 Performance Measurement, Reporting, and Tracking

Management systems are in place that provide timely, objective, and reliable indication of ESH&QA performance to managers and supervisors at all levels.

MY.07 Internal Oversight

Internal oversight of ESH&QA activities is performed at the operating level by persons not directly responsible for performance of the activities being appraised.

MY.08 External Oversight

Management systems are in place that ensure support and cooperation with organizations performing external oversight of ESH&QA activities. The systems ensure effective identification, follow-up, tracking, and definition of deficiencies; they also ensure prompt corrective action.

MY.09 Risk Management

A procedure is in place that provides for an analysis of all existing and proposed operations, including unusual occurrences, and that requires the identification of hazards, their elimination or control, the assessment of risk, and the documented management authorization of operation.

MY.10 Root Cause Analysis and Corrective Action

Management ensures that a system is in place, which is effective in evaluating deficiencies in order to determine the underlying or root cause, that develops corrective actions aimed at root causes.

MY.11 Unusual Occurrences

As required by DOE Order 5000.3, management ensures that effective and comprehensive systems are in place for identifying, reporting, tracking, and investigating unusual occurrences that affect ESH&QA.

MY.12 Emergency Management

Management ensures that plans are in place to deal promptly and efficiently with potential emergencies and that personnel and equipment to deal with emergencies are in a continual state of readiness.

MY.13 Nuclear Safety

Nuclear reactors and facilities are designed and operated in strict accordance with well documented processes and procedures for control of nuclear safety and for identifying and controlling associated risks.

OR.01 Organization Structure

The organization is established in such a manner that the functions, assignments, responsibilities, and reporting relationships of individuals are clearly defined, understood, and effectively implemented. All major parts of environmental protection, safety, health, and Quality Assurance (ESH&QA) responsibilities are included, with emphasis on line management control of ESH&QA.

OR.02 Corporate Culture and Policy

Corporate policy and practices reflect a strong commitment to excellence in all activities, including ESH&QA. They foster an organizational culture that motivates persons at all levels to achieve performance that exceeds minimum requirements and standards.

OR.03 Corporate Support

The corporate organization effectively supports the plant or project and minimizes the assignment of duties to the plant or project staff that are not directly related to day-to-day plant or project management.

OR.04 Communication

Communication, liaison, and coordination between groups and individuals in the organization is timely and effective as a positive contribution to ESH&QA performance.

OR.05 Senior Executive

The senior executive receives appropriate support and has the authority and control necessary to carry out his responsibilities.

OR.06 Plant or Project Management

The plant or project manager has full responsibility and is accountable for all activities within the plant or project. He/she understands and is committed to ESH&QA goals and objectives.

PR.01 Staffing

Management provides an adequate staff of qualified personnel to ensure effective and viable ESH&QA programs and affords professional development opportunities to staff personnel.

PR.02 Experience, Skills Training and Certification

Management ensures that persons with the necessary experience, skills, training, and certification are provided to meet ESH&QA goals and objectives.

PR.03 Fitness-For-Duty

A fitness-for-duty program, is in place which identifies persons who are unfit for their assigned duties as a result of drug or alcohol use, or other physical or psychological conditions, and removes them from such duty and from access to vital areas of the facility.

DISTRIBUTION

13	DOE/OSTI-4500-R75 UC600	
865	SNL Supervisors and above	
150	3200	K. Gillings
1	8524	J.A. Wackerly
5	3141	S.A. Landenberger
3	3151	G.L. Esch, actg.
20	3600	E.D. Graham, Jr.
35	DOE/AL	A. Chernoff
408	3211	M.K. Phillips

☆ U.S. GOVERNMENT PRINTING OFFICE 1991 - 573-122/40051

RECEIVED
FEB 14 1991
3141