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Sandia National Laboratories, California Environmental Management System Program Manual

Barbara L. Larsen

Prepared by
Sandia National Laboratories
Livermore, California 94550

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Occupational Health, Safety, and Environmental Management Department
Sandia National Laboratories, California
7011 East Avenue
Livermore, CA 94550

Abstract

The Sandia National Laboratories, California (SNL/CA) Environmental Management System (EMS) Program Manual documents the elements of the site EMS Program. The SNL/CA EMS Program conforms to the International Standard on Environmental Management Systems, ISO 14001:2004and Department of Energy (DOE) Order 436.1.

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Summary of Document Changes

Significant changes made to the 2013 edition of the EMS Program Manual are marked with a sidebar within the document and summarized in Table 1.

Table 1 Summary of Changes to EMS Program Manual, 2013

Section	Page	Change
2	15	SNL/CA ES&H Standard of Performance updated with new VP signature and engineered safety statement.
3	18	Updated the EMS Management structure to reflect recent changes in management.
3	19	Revised to reflect new site VP.
3	20-22	Revised roles, responsibilities, and authorities memo.
4.1	24	Updated the ranking scores for environmental aspects.
5.3	29	Updated the risk ranking figure for normal and off-normal aspects.
6.2	34	Actions / Means to support FY13 targets.
7	35	Updated to reflect new department and environmental functional area structures.
8	37	Updated to reflect new department and environmental functional area structures. Removed Chemical Management as an environmental function.
8.4	39	Updated functional area descriptions for Pollution Prevention.
8.5	39	Updated functional area descriptions for Waste Management.
9.3	45	Updated new / modified environmental requirements table.
10.2.4	49	Added revised work planning and control figure.
11.3	53	Updated to reflect new department and environmental functional area structures.
12.3	56-57	Updated text to indicated focus on risk assessment rather than hazard assessment.
14	61	Updated the ISO re-registration date to May 2012.
14	62	Updated Table 11 to reflect the change to AIS from CATS and LESA.
15	63	Added new EMS audit figure.
15.1.1	64	Updated with results of 2013 gap analysis.
15.2	64	Updated with results of 2013 EMS Management Representative review.
16.1	65	Updated to reflect change to AIS from CATS and LESA.
16.2	65	Updated to reflect change to AIS from CATS and LESA.
16.3	65	Added section on causal analysis.
17	67	Updated with results of last two top management reviews.
20.2	74	Updated with external communications conducted in 2012.

Acronyms and Abbreviations

BAAQMD	Bay Area Air Quality Management District
CARB	California Air Resources Board
CATS	Corrective Action Tracking System
CCR	California Code of Regulations
CEDT System	Corporate Education, Development, and Training System
CFR	Code of Federal Regulations
DOE	Department of Energy
EMS	Environmental Management System
EO	Executive Order
EP Rep	Environmental Programs Representative
ES&H	environment, safety, and health
FIFRA	Federal Insecticide, Fungicide, and Rodenticide Act
H&S Code	Health and Safety Code
HPSB	High Performance Sustainable Building
IDT	Interdisciplinary Team
ISMS	Integrated Safety Management System
ISO	International Organization for Standardization
JSA	Job Safety Analysis
LEED	Leadership in Energy and Environmental Design
LESA	Laboratory Enterprise Self Assessments
M&O Contract	management and operating contract
MSDS	material safety data sheet
NEPA	National Environmental Policy Act
PHS	primary hazard screening
QA	quality assurance
QAPP	Quality Assurance Program Plan
RCRA	Resource Conservation and Recovery Act
SSHEAC	Security, Safety, Health & Environment Action Committee
SME	subject matter expert
SNL	Sandia National Laboratories
SNL/CA	Sandia National Laboratories, California
SNL/NM	Sandia National Laboratories, New Mexico
SWPPP	Stormwater Pollution Prevention Plan
USC	United States Code
WPC	Work Planning and Control

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1 Program Introduction

Sandia National Laboratories, California (SNL/CA) has maintained environmental functions to assist with regulatory compliance for more than 30 years. During 2005, these existing functions were rolled into a formal environmental management system (EMS) that expands beyond the traditional compliance focus to managing and improving environmental performance and stewardship practices for all site activities. An EMS is a set of inter-related elements that represent a continuing cycle of planning, implementing, evaluating, and improving processes and actions undertaken to achieve environmental policy and goals. The SNL/CA EMS Program conforms to the International Standard for Environmental Management Systems, ISO 14001:2004 (ISO 2004). The site first received ISO 14001 certification in September 2006 and recertification in 2009 and 2012.

SNL/CA's EMS Program is applicable to the Sandia, Livermore site only. Although SNL/CA operates as one organizational division of the overall Sandia National Laboratories, the EMS Program is site-specific, with site-specific objectives and targets. SNL/CA (Division 8000) benefits from the organizational structure as it provides corporate level policies, procedures, and standards, and established processes that connect to and support elements of the SNL/CA EMS Program. Additionally, SNL/CA's EMS Program benefits from two corporate functional programs (Facilities Energy & Water Resource Management and Fleet Services programs) that maintain responsibility for energy management and fleet services for all Sandia locations[1]. Each EMS element is further enhanced with site-specific processes and standards.

Division 8000 has several groups operating at Sandia National Laboratories, New Mexico (SNL/NM). Although these groups, from an organizational perspective, are part of Division 8000, they are managed locally and fall under the environmental requirements specific to their New Mexico location. The New Mexico groups in Division 8000 follow the corporate EMS Program for New Mexico operations.

1.1 Integration with Corporate EMS Standards

The requirement for an EMS at SNL/CA was initially driven by DOE Order 450.1A, *Environmental Protection Program.* Order 450.1A was cancelled in 2011 and replaced by Order 436.1, *Departmental Sustainability.* DOE Order 436.1 was established to ensure that an EMS and site sustainability are at the forefront of environmental excellence. Although this order is not within the Sandia Management and Operations Contract (M&O Contract), the intent of the Order is implemented through an M&O Contract requirement for Sandia to maintain an EMS that is certified to the International Organization for Standardization (ISO) 14001 standard.

1.2 SNL/CA EMS Program Mechanics

SNL/CA prepared the *Sandia National Laboratories, California Environmental Management System Program Manual* (EMS Manual) to document and provide a roadmap to its EMS

[1] Water resources are managed locally by SNL/CA personnel.

Program. Annually, the SNL/CA EMS Core Team updates the EMS Manual to document the aspects/impacts of current operations, the goals and objectives that respond to these impacts and the EMS changes and improvements that occurred during the year. The EMS Manual represents a point in time. Updated information about the EMS program is added to the Occupational Health, Safety, and Environmental Management Department website. Consequently, the most up-to-date information is typically found on Sandia's website.

The SNL/CA EMS Program encompasses an annual cycle of planning, implementing, assessing, and improving operations in support of site-specific environmental goals. The EMS Program cycle is presented in Figure 1. As shown, the EMS cycle aligns with the budget cycle so that investment and resource requirements can be requested for the next budget year. To provide further detail of the timing of EMS actions throughout the year, an annual EMS calendar is maintained and included as Figure 2.

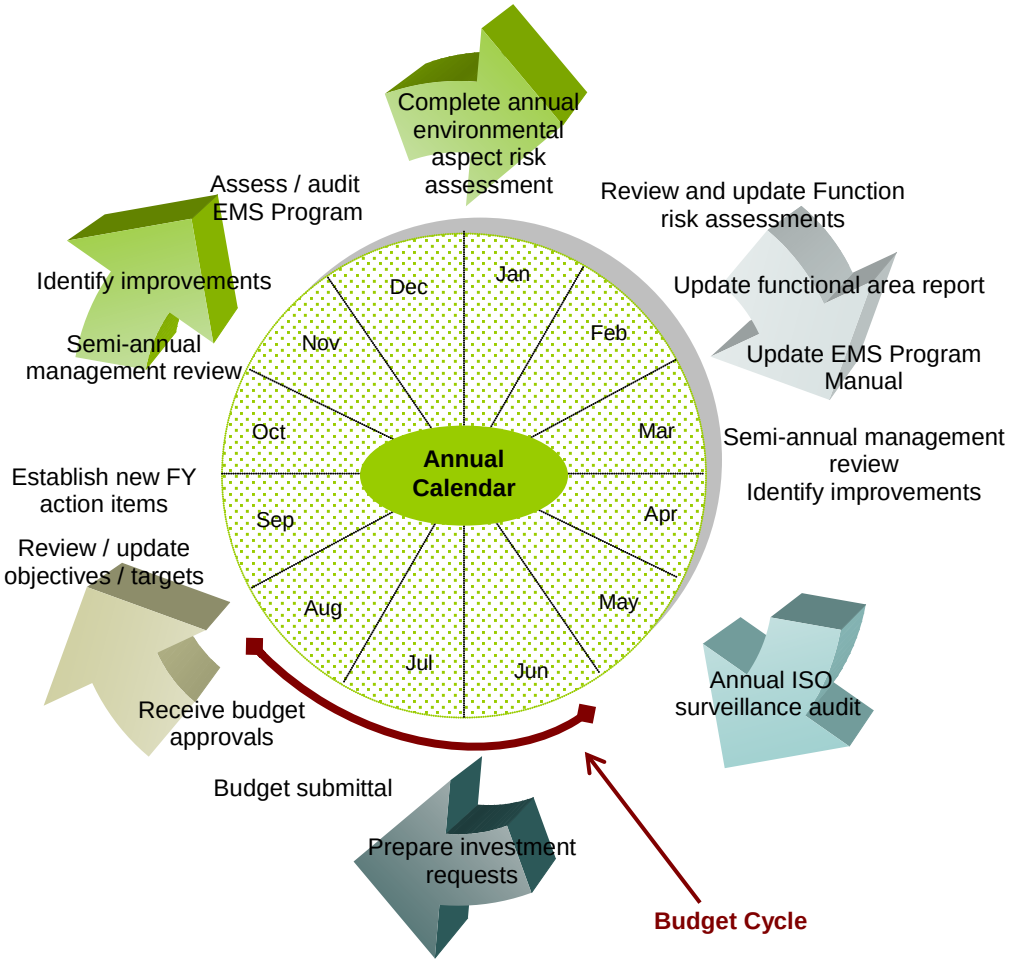

Figure 1 EMS Program Cycle

Figure 2 Annual EMS Calendar, 2013

FY 2013						Month											
EMS Calendar of Major Tasks	Assigned To	Start Date	Complete Date	% Complete	Last Update	O 12	N 12	D 12	J 13	F 13	M 13	A 13	M 13	J 13	J 13	A 13	S 13
Staff Workload (Higher # = more busy)						6	6	6	8	7	5	6	6	6	8	8	7
RISK ASSESSMENT																	
Annual Environmental Aspect Risk Assessment	Core Team	11/1/2012	12/1/2012	0%													
Environmental Programs PHS update	Leads	1/1/2013	2/1/2013	0%													
Review / update program risk assessments	Leads	1/1/2013	2/1/2013	0%													
PROGRAM REPORTS																	
Update annual program reports	Leads	2/1/2013	4/1/2013	0%													
Dept. Mgr review & approval of program reports	Shamber	2/1/2013	4/1/2013	0%													
Publish annual program reports - website	Leads	3/1/2013	4/1/2013	0%													
OBJECTIVES/TARGETS/ACTIONS PLANNING																	
Establish/modify objectives and targets for FY2014	Core Team	8/1/2013	10/1/2013	0%													
SSHEAC review/approval of objectives/targets for FY2013	SSHEAC	10/1/2012	10/31/2012	0%													
Establish actions supporting objectives/targets	Core Team	10/1/2012	1/31/2013	0%													
Modify FY13 objectives/targets/actions based on SSHEAC feedback	Core Team	11/1/2012	11/31/2012	0%													
REPORTING/MANAGEMENT REVIEW																	
Top Mgmt EMS Review 1 - Prior FY (FY12) performance, metrics, new objectives/targets review and approval (FY 2013)	Shamber	10/1/2012	10/31/2012	0%													
Top Mgmt EMS Review 2 - Audit results, new/changed rregulations, external communications, corrective/preventive actions, follow-up actions, recommendations for improvement	Shamber	4/1/2013	4/31/2013	0%													
EMS PROGRAM MANUAL																	
Annual EMS Program Manual update	Larsen	3/1/2013	5/1/2013	0%													
Dept. Mgr review & approval of EMS manual	Shamber	4/1/2013	5/1/2013	0%													
Publish annual EMS Manual - website	Larsen	4/15/2013	5/15/2013	0%													
EARTH DAY																	
Earth Day Planning	Dicker	2/15/2013	4/15/2013	0%													
Earth Day / EMS awareness survey	Shamber	4/15/2013	4/22/2013	0%													
Virtual Earth Day website	Core Team	4/1/2013	4/22/2013	0%													
ANNUAL ASSESSMENTS																	
Prepare annual program self assessment plans	Leads	10/1/2012	11/1/2012	0%													
Mgr approval of self assessment plans	Shamber	11/1/2012	11/1/2012	0%													
Perform program line self assessment	Leads	11/1/2012	2/1/2013	0%													
Perform annual EMS self assessment	Shamber	11/1/2012	2/1/2013	0%													
ISO CERTIFICATION ACTIONS																	
Surveillance Audit 2013	Core Team	5/6/2013	5/9/2013	0%													
MISCELLANEOUS EMS ACTIONS																	
Update Env reports/documents spreadsheet	Shamber	10/1/2012	11/1/2012	0%													
Annual VP Delegation of Authority	Shamber	10/13/2012	10/13/2012	0%													
ASER Preparation - draft submission	Larsen	1/1/2013	3/8/2013	0%													
ASER Submission - final (CY summary)	Larsen	6/1/2013	6/1/2013	0%													
Publish and distribute ASER	Larsen	6/1/2013	8/1/2013	0%													
Review web-based EMS Roadmap and correct as appropriate - Qtrly	Larsen	10/1/2012	9/30/2013	0%													

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2 SNL/CA Environmental Policies

SNL/CA follows corporate and site-specific environmental policies that are combined with broader environment, safety, and health (ES&H) requirements. The Sandia corporate ES&H policy (ESH100) (SNL 2013a) states: It is the policy of Sandia Corporation to protect Members of the Workforce and the public, prevent incidents, and integrate environmental stewardship and sustainability throughout the life cycle of its activities. Sandia's ES&H performance objectives also include creating a work environment that strives for zero environmental incidents and zero operational fines, violations, or penalties.

In addition, the SNL/CA Vice President re-issued a Division 8000 ES&H standard of performance statement in April 2013. The statement reinforces individual accountability, environmental stewardship, and regulatory compliance. It also stresses the need to move beyond compliance requirements to nurture a positive ES&H culture at all levels of the workforce.

Annually, the SNL/CA EMS Core Team reviews the ES&H standard of performance statement to ensure that it remains aligned with the site vision and the corporate ES&H policy. This review is executed as part of the internal EMS program audit. If needed, the EMS team presents recommendations for revisions to site management during the management review process described in Chapter 17.

The Standard of Performance Statement resides on the SNL/CA ES&H website at http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt/policy and the Sandia external website at http://www. sandia.gov/about/environment/environmental_management_system/sandia_california_environmental_management/index.html.

SNL/CA ES&H Standard of Performance

SNL/CA personnel are firmly committed to meeting all corporate and regulatory ES&H policies and requirements that apply to its operations. The application of compliant ES&H principles and practices is considered a fundamental element of everyone's work assignment.

In this regard, SNL/CA personnel commit to:

- **Nurture a safety and health conscious work ethic and culture.** We will all assume responsibility for creating and maintaining a worksite, as well as performing our work, in a manner that respects and supports the safety and health of every individual. SNL/CA personnel believe that all accidents are preventable. We will all strive to create a workplace that is free of accidents and injuries.

- **Be a responsible steward of the environmental resources in our care.** We will integrate environmental risk assessment, planning and impact mitigation into every aspect of our work. SNL/CA programs, operations, processes, and facilities will be planned and managed such that they support environmental objectives and targets to minimize the creation of waste, pollution, and adverse impact on the public and the environment. SNL/CA personnel will remain committed to an efficient and effective EMS as part of the laboratory's Integrated Safety Management System.

- **Comply with all applicable laws, regulations and permits.** Compliance with the letter and the spirit of ES&H laws and regulations is viewed as the minimum acceptable standard. When necessary and appropriate we will go beyond legal mandates in order to implement more effective approaches and to nurture a positive and learning ES&H culture. SNL/CA personnel are committed to continual improvement in all aspects of our environment, safety, and health performance and commits to establish performance indicators to guide these efforts and measure our progress.

- **Employ engineered safety principles.** We will integrate an engineered safety approach into all aspects of our work. We will strive for an operational system where safety is an attribute achieved by intent; is systematically and critically analyzed to identify ways in which it can fail to perform as intended; and is designed and validated to prevent identified potential failure modes and mitigate the consequences of a failure, should one occur.

3 Structure, Responsibilities, and Authorities

3.1 Management Structure

The management structure for SNL/CA's EMS Program is depicted in Figure 3. As shown, the EMS Program is implemented through the Occupational Health, Safety, and Environmental Management (OHSEM) Department under the Site Operations Center. Site Operations is one of six centers at SNL/CA reporting to the SNL/CA (Division 8000) Vice President. The site Vice President oversees the Security, Safety, Health, & Environment Action Committee (SSHEAC) comprised of the site vice president and center directors. SSHEAC provides leadership and strategic management oversight of Security and ES&H for Division 8000, and validates and approves the site EMS Program. The SNL/CA EMS Core Team manages day-to-day implementation and maintenance of the EMS Program.

3.2 Key Responsibilities

SNL/CA personnel with key responsibility for the EMS Program include the site Vice President, the Director of Site Operations, the Level II Manager for ES&H, Facilities, and Security, the Manager for the OHSEM Department, and the environmental function subject matter experts. The site Vice President holds overall responsibility for the success of the SNL/CA EMS Program and establishes the ES&H standard of performance for all site operations. The Director, Level II Manager, and Department Manager are responsible for providing the appropriate resources to implement and maintain the EMS, functional programs, and site infrastructure to support EMS objectives and targets. The Department Manager also serves as the designated management representative for the EMS. The functional program leads are responsible for day-to-day management of EMS elements and for assisting the site workforce in meeting established objectives and targets. The Environmental Programs Representative serves as an environmental liaison to the workforce. SNL/CA personnel assigned to each job function are listed in Table 2.

3.3 Authorities

EMS authorities at SNL/CA are defined in an internal memorandum issued by the Division 8000 Vice President on April 18, 2013. Authorities are defined for all levels of the workforce from the site vice president, directors, and managers, to the basic worker. A copy of the authorities memorandum is provided in Figure 4.

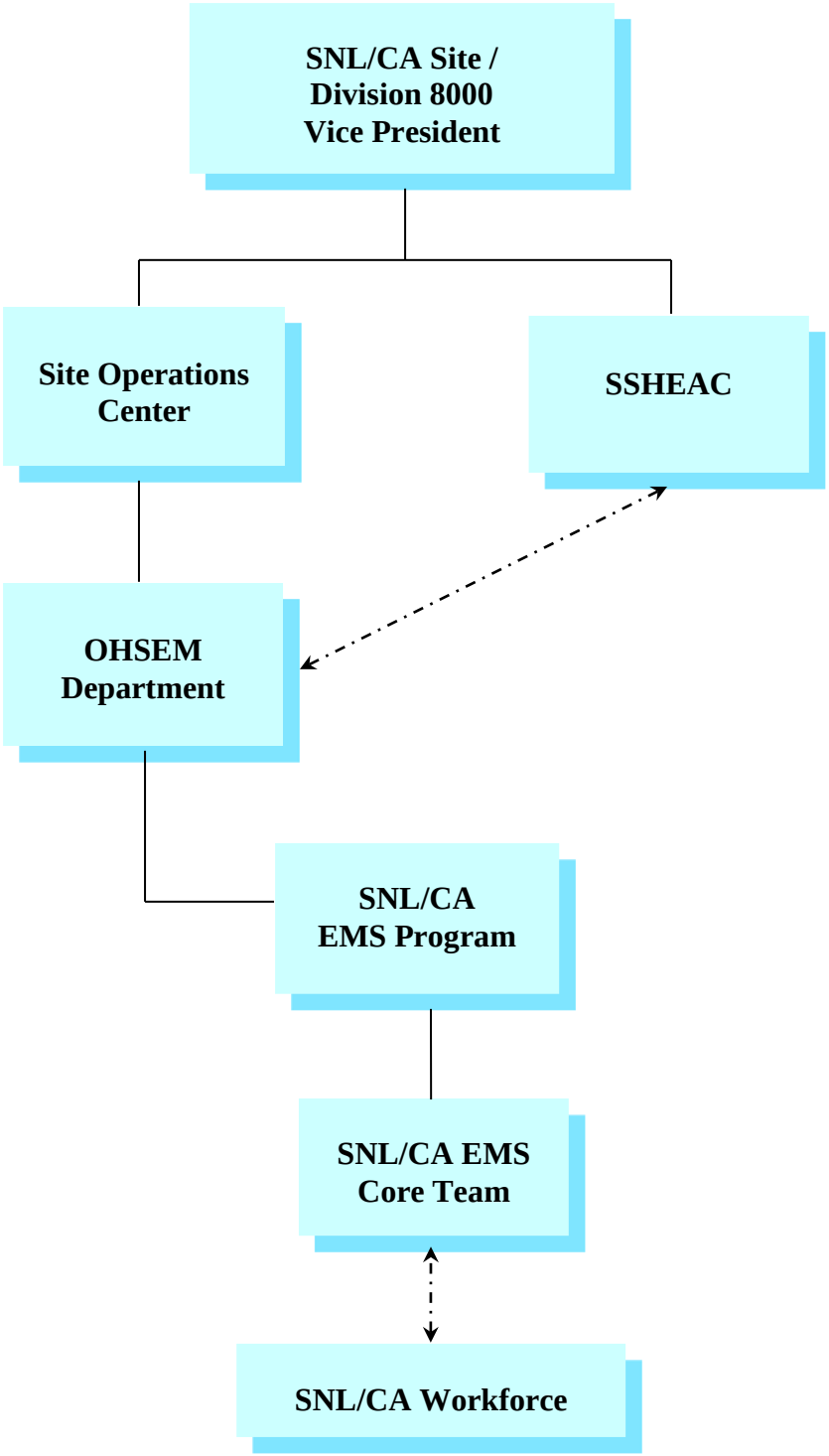

Figure 3 SNL/CA EMS Management Structure

Table 2 SNL/CA EMS Key Personnel, 2013

Job Function or Title	Name
Vice President, SNL/CA (Division 8000)	J. Stephen Rottler
Director, Site Operations	Denise Koker
Level II Manager, ES&H, Facilities, and Security	John Garcia
OHSEM Department Manager	Gary Shamber
Designated Management Representative	Gary Shamber
Environmental Programs Representative	Deanna Dicker
Environmental Function Subject Matter Experts:	
Air Quality	Leslee Gardizi
Environmental Monitoring and Ecology	Robert Holland
Environmental Planning	Barbara Larsen
Pollution Prevention and Waste Minimization	Deanna Dicker
Waste Management	Janet Harris

Figure 4 SNL/CA EMS Authorities and Responsibilities

Sandia National Laboratories

Operated for the U.S. Department of Energy by
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Livermore, CA 94551-0969

date: April 18, 2013

to: Division 8000 / CA Site Members of the Workforce

from: J. Stephen Rottler, 8000, MS 9001

subject: Personal Authorities and Responsibilities regarding the SNL/CA Environmental Management System (EMS).

SNL/CA's Environmental Management System (EMS) is ISO14001:2004 certified. Certification requires that roles, responsibilities and authorities of persons working for or on behalf of the SNL/CA EMS be identified and approved. This memorandum constitutes this identification and approval by me. Please direct questions and concerns to the site EMS Management Representative, Gary Shamber, 4-2237.

Vice President	o Approve and communicate the site environmental standard of performance, o Demonstrate full commitment, priority and support to the EMS and the maintenance of ISO14001 certification, o Communicate the site's environmental stewardship commitment to the local community as opportunities to do so are presented, o Provide annual delegation of authority for the generation and submission of required environmental reports, documents and payment of fees, o Approve changes to environmental policies or practices, o Approve site environmental objectives and targets.
Directors	o Promote site awareness of environmental objectives and targets, o Champion a culture of environmental stewardship within their center as the normal way of conducting business, o Review proposed changes to environmental policies/practices as well as changes to site objectives and targets and make recommendations to VP.

Exceptional Service in the National Interest

Senior Managers	o Promote center awareness of environmental policies, objectives and targets, o Promote a culture of environmental stewardship as the normal way of conducting business, o Assure center environmental performance and regulatory compliance.
Managers	o Communicate environmental policies, objectives and targets to the department members of the workforce (including contractors working on their behalf), o Assure operations remain compliant with all applicable environmental requirements, o Develop, execute and maintain processes and procedures that minimize the production of waste (all types), minimize air and water pollutant emissions, promote water and energy conservation and encourage procurement of environmentally friendly products and services, o Assure that key individuals who support specific environmental duties/actions remain trained and certified and perform their duties as required. o Communicate environmental performance issues and difficulties to the EMS Management Representative or appropriate environmental SME.
Members of the Workforce	o Comply with all environmental laws and requirements, o Plan and perform all operations and activities such that they are compliant with environmental regulation and support site environmental goals, objectives and targets, o Refrain from participating in operations or activities that are non-compliant with environmental laws and requirements, o Report all environmentally non-compliant operations or activities, o Suspend operations and activities they observe to be non-compliant with environmental laws and requirements.
Director, Site Operations	o Ensure adequate budget and resources for EMS and the maintenance of the site ISO14001 certification.
EMS Management Representative	o Ensure that an EMS is established, implemented and maintained in accordance with ISO14001, o Annually propose goals, objectives and targets (reflecting site operations) aimed at reducing environmental risks and impacts (this is done through

	the division Security, Safety and Environmental Action Committee (SSHEAC), o Annually report to site top management (SSHEAC) on the performance and status of the site EMS, o Recommend improvements of the site EMS. o Promote environmental awareness and best practices.
Manager, Environmental Management	o Provide effective execution of the corporate and site environmental program, o Manage the environmental functions such that they will enable the site to achieve approved environmental goals, objectives and targets. o Establish effective and efficient site environmental processes and procedures.
Procurement & Purchasing Management	o Develop, maintain and execute processes and procedures that support the procurement of environmentally supportive (friendly) products and services. o Communicate the site's environmental policies to suppliers, vendors and contractors and include contract requirements and provisions as necessary to fully implement and support the EMS.
Facilities Management	o Develop, maintain and execute processes and procedures that support sustainable design principles in facilities design, construction and operations, o Develop, execute and maintain processes and procedures that minimize the environmental impacts of site and building construction and maintenance.
Subject Matter Experts, ES&H Coordinators, Facility Management Coordinators and Environmental Programs Representative	o Assist members of the workforce in the environmental planning, analysis and execution of projects and activities to reduce environmental impacts and risks and remain compliant with environmental requirements.

Distribution:
SNL/CA Members of the Workforce

4 Environmental Aspects

An environmental aspect is an element of an organization's activities, products, or services that can interact with the environment. Simply put, an environmental aspect is a pathway for an environmental impact, either beneficial or adverse. For 2013, the EMS Core Team reviewed the previous environmental aspects identified for SNL/CA to reaffirm their applicability to current operations. SNL/CA's environmental aspects are presented in Table 3 along with the specific site activities that correspond to each aspect.

Table 3 SNL/CA Environmental Aspects

Environmental Aspect	Site activity
Water discharges	office operations, medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, general environmental operations
Air emissions	laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, onsite receiving and transportation, offsite transportation
Land use	general environmental operations, facilities construction and deconstruction, exterior maintenance and operations
Material procurement and use	office operations, medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, general environmental operations
Hazardous materials	medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, security operations
General transportation	onsite receiving and transportation, offsite transportation, security operations
Radioactive and mixed waste	laboratory and test activities
Hazardous waste	medical operations, laboratory and test activities, facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations, security operations, office operations
Biological agents	laboratory and test activities
Radiological materials	laboratory and test activities
Contaminated sites	general environmental operations
Solid waste (non-hazardous)	office operations, medical operations, laboratory and test activities, facilities construction and deconstruction, building maintenance and operations, security operations, onsite receiving and transportation
Legacy asbestos	facilities construction and deconstruction, exterior maintenance and operations, building maintenance and operations
Natural gas use	office operations, medical operations, laboratory and test activities
Water use	office operations, medical operations, laboratory and test activities, exterior maintenance and operations, facilities construction and deconstruction, building maintenance and operations
Hazardous material transportation	onsite receiving and transportation, offsite transportation
Electricity use	office operations, medical operations, laboratory and test activities
Fire	emergency event
Earthquake	emergency event

4.1 Significant Environmental Aspects

Significant environmental aspects for SNL/CA were identified through the risk ranking process described in Section 5.3. The site's significant aspects are those with the highest risk score under normal operations: water discharges, air emissions, land use, general transportation, and hazardous waste. Table 4 provides the complete list of SNL/CA aspects for 2012 along with the ranking score from the risk assessment process for both normal operations and off-normal events. Significant environmental aspects are highlighted in bold. The risk ranking for off-normal events is also shown in Table 4 (highlighted in italics). There was no change in significant aspects from 2012 to 2013.

Table 4 Ranking of SNL/CA Environmental Aspects

Aspect	**Ranking Score[a]**		**Aspect**	**Ranking Score[a]**	
	Normal	Off-Normal		Normal	Off-Normal
Air emissions	**14.3**	8	*Radioactive and mixed waste*	*5*	*42*
Water discharges	**14**	20	Contaminated sites	5	0
Land use	**11**	15	Water use	4.8	18
General transportation	**11**	1	Natural gas use	4.5	21
Hazardous waste	***8.8***	*45*	*Hazardous material transportation*	*4*	*44*
Material procurement and use	6.3	16	*Legacy asbestos*	*4*	*34*
Hazardous materials	7	13	Electricity use	4	11
Solid waste (non-hazardous)	6	10	EMERGENCY ASPECTS		
Radioactive materials	6	24	Fire	0	22
Biological agents	*5*	*52*	Earthquake	0	26

[a] See Section 5.3 for description of methodology used to rank environmental aspects.

5 Quality Assurance and Risk Management

SNL/CA follows the Corporate Quality Assurance (QA) Process defined in Corporate Procedure: CG 100.5 (SNL 2012b). Site-specific procedures enhance SNL/CA'S overall approach to quality assurance. The OHSEM Department supports corporate requirements and site quality objectives in two primary ways: 1) by implementing all required processes and procedures; and 2) by applying a vigorous risk management approach to the EMS, individual environmental functions, and worker safety. Figure 5 depicts the elements of the OHSEM Department's risk management process.

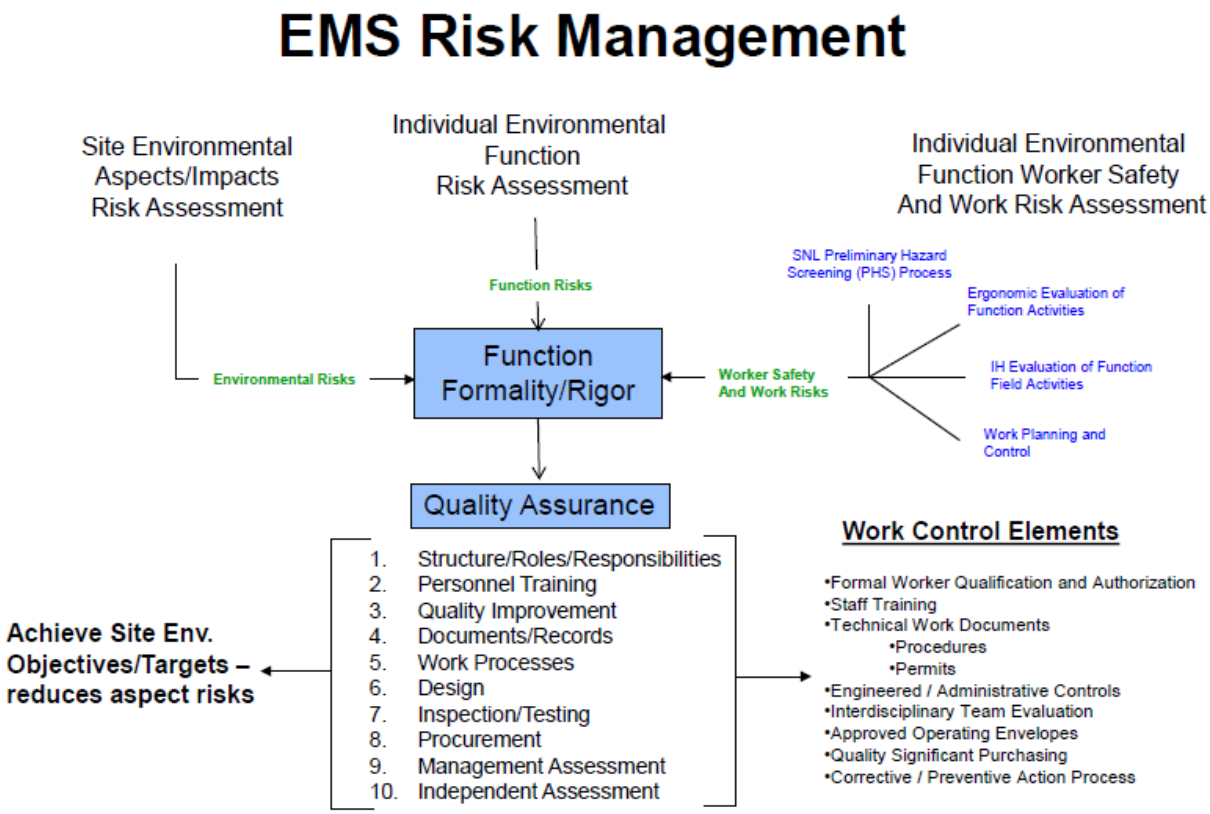

Figure 5 OHSEM Department Risk Management Diagram

5.1 Identifying and Managing Risk to Environmental Personnel

The execution of each of the five EMS environmental functions introduces personal risks to the staff performing the various actions of these function s. Identification of risk (or hazards) to workers occurs through implementation of the Division 8000 work planning and control (WPC) process, a graded approach for managing activity-level work. The process incorporates existing

tools/systems such as the corporate primary hazard screening (PHS) software, a site Interdisciplinary Team (IDT) review, and a job safety analysis (JSA) to identify hazards. The PHS uses a detailed set of questions about all aspects of environment, safety, and health. The PHS software generates a hazard evaluation based on the answers provided, and identifies training requirements and safety controls needed to protect the workforce. The JSA focuses on individual steps in an activity and associated hazards. Results of both the PHS and the JSA support the operating envelope that is presented to the IDT. An IDT review results in a rigor level determination for a specific activity or set of activities. Each environmental function maintains a program-specific PHS, has established an operating envelope through the WPC process, and has identified the rigor level to manage the safety risks associated with function activities. As new activities and changes to activities occur, the WPC process is reinitiated to ensure that the PHS, operating envelope, and rigor level remain valid for environmental functions.

5.2 Identifying and Managing Environmental Function Risk

Each environmental function completes an annual risk assessment to evaluate potential environmental risk as it relates to a specific site activity or aspect of site operations. For risks that are categorized as high, actions are identified and implemented to manage and control the risk. The OHSEM Department uses the annual risk assessment as a best management practice to further the goals of the EMS and manage the risks associated with the site's environmental aspects.

5.3 Identifying and Managing Risk Associated with Environmental Aspects

Annually, the EMS Core Team ranks the environmental aspects identified through the EMS Program to evaluate the risks of SNL/CA operations. Environmental aspects are ranked first under normal operating conditions using a modified risk assessment process that accounts for existing controls, compliance programs, and EMS improvements made during the previous year. Each aspect is evaluated against nine exposure pathways and rated on an impact scale from zero to 3 (negligible to high consequence). The resulting risk score is then adjusted (either up or down) to account for changes that occurred in the previous year in funding, resources, knowledge, or activity level gained or lost. Figure 6 shows the assessment matrix for one environmental aspect under normal operating conditions. A second assessment of each aspect is performed for a plausible off-normal event (determined by the core team and listed for each aspect) using a similar risk assessment process with the addition of a probability index of zero to 4 (zero to very high probability of an occurrence). Figure 7 shows the assessment matrix for an environmental aspect for an off-normal event. Ranking results are compiled and presented in Figure 8. Figure 9 graphically shows a summary of the ranking assessment for both normal operations and off-normal events. As shown, the highest risk aspects associated with normal operations are different from those identified for off-normal events.

The results of the aspects risk analysis are used to validate the resources applied to the environmental program that manages those risks. The results are also used to help establish the set of actions for the year that are designed to:

- Reduce the impacts of high-risk normal operations;
- Reduce the probability of high-risk off-normal events;
- Reduce the consequences of high-risk off-normal events should they occur.

ASPECT: Water Discharges - Normal Operations

		Risks of Impact							
Environmental Impact		Environmental Damage	Safety and Health	Programmatic Impact	Compliance	Financial liability or cost	Negative Reputation or Publicity	Total Risks	Risk Score
Contamination of air		0	0	0	0	0	0	0	0
Contamination of ground water or surface water		1	0	1	2	2	2	8	8
Contamination of soil		1	0	0	0	0	0	1	1
Contamination of facilities (building or equipment)		0	0	0	1	1	0	2	2
Offsite disposal (landfill or long term storage)		0	0	0	1	1	0	2	2
Exposure to workforce		0	0	0	0	0	0	0	0
Exposure to public		0	0	0	0	0	0	0	0
Depletion of Natural Resources		0	0	0	0	0	0	0	0
Effect on Wildlife or Habitat		1	0	0	0	0	0	1	1
									14
								Probability Adjustment (multiplier)	1
								Total Score	14

Risks		Value
Negligable		0
low		1
medium		2
high		3

Probability Adjustment from Prior Year	degree of change	multiplier
Loss of funding		
Loss of resources		
Loss of knowledge		
Increase level of activity		
Increase in funding		
Increase in resources		
Increase in knowledge		
Decrease in activity		

expect change in FY12 - stormwater

Degree of Change	Prob. Mult.
negligible	1
low	+/- 10%
medium	+/- 20%
high	+/- 30%

Figure 6 Aspect Ranking Example - Normal Operations

ASPECT: Water Discharges - Off Normal

Environmental Impact	Failure Probability	Risks of Impact: Environmental Damage	Safety and Health	Programmatic Impact	Compliance	Financial liability or cost	Negative Reputation or Publicity	Total Risks	Risk Score
Contamination of air	1	0	0	0	0	0	0	0	0
Contamination of ground water or surface water	1	2	1	1	1	3	2	10	10
Contamination of soil	1	0	0	0	0	0	0	0	0
Contamination of facilities (building or equipment)	1	0	1	0	0	0	0	1	1
Offsite disposal (landfill or long term storage)	1	1	0	0	0	0	0	1	1
Exposure to workforce	1	0	0	0	0	0	0	0	0
Exposure to public	1	0	1	0	0	1	2	4	4
Depletion of Natural Resources	1	0	0	0	0	0	0	0	0
Effect on Wildlife or Habitat	1	1	1	0	1	0	1	4	4
									20

Probability		Value
zero or N/A	0	0
low	<20%	1
medium	20-50%	2
high	50-80%	3
very high	>80%	4

Risks		Value
Negligable		0
low		1
medium		2
high		3

Off Normal Scenario: An discharge from operations to the sanitary sewer that negatively affects operations at the Livermore sewer plant.

Figure 7 Aspect Ranking Example - Off-Normal Event

Aspects (Top 5 Significant in Red) Updated: 3/27/13	Contamination of Air		Contamination of Ground Water or Surface Water		Contamination of Soil		Contamination of Facilities (bldgs or equip.)		Offsite Storage(landfill or long term)		Exposure to Workforce		Exposure to Public		Depletion of Natural Resources		Effect on Wildlife and Habitat		Total Impact Score - Normal Operations	Probability Multiplier due to change from prior year baseline.	Adjusted Impact Score - Normal Operations	Rank - Top 5 Significant Identified in Red	Total Impact Score - Off Normal Event	Rank
	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON	N	ON						
Air Emission	6	6	0	0	0	0	2	0	0	0	3	2	0	0	0	0	0	0	11	1.3	14.3	1	9	17
Legacy Asbestos	1	4	0	0	0	0	3	8	0	4	0	9	0	9	0	0	0	0	4	1	4	15	34	5
Biological Agents	2	0	0	0	0	0	0	11	0	0	3	15	0	15	0	0	0	11	5	1	5	11	52	1
Contaminated Sites (Areas)	0	0	3	0	2	0	0	0	0	0	0	0	0	0	0	0	0	0	5	1	5	11	0	19
Water Discharges	0	0	8	10	1	0	2	1	2	1	0	0	0	4	0	0	1	4	14	1	14	2	20	10
Hazardous Material	0	0	0	0	0	0	1	0	0	0	4	12	2	1	0	0	0	0	7	1	7	6	13	14
Hazardous Waste	0	0	0	6	0	0	0	6	4	16	4	5	0	12	0	0	0	0	8	1.1	8.8	5	45	2
Hazardous Material Transportation	1	4	0	7	0	7	0	5	0	1	0	14	2	0	1	1	0	5	4	1	4	15	44	3
General Transportation	2	-3	2	0	0	0	1	0	1	1	1	5	1	-1	2	-1	1	0	11	1	11	4	1	18
Solid Waste (Non-Hazardous)	0	0	0	0	0	0	0	0	3	12	0	0	3	0	-1	-2	1	0	6	1	6	8	10	16
Radiological Materials	0	0	0	5	0	6	4	5	0	3	2	5	0	0	0	0	0	0	6	1	6	8	24	7
Radiological and Mixed Waste	0	6	0	0	0	6	0	7	5	12	0	0	0	9	0	0	0	2	5	1	5	11	42	4
Material Procurement and Use	1	1	1	1	1	1	0	0	3	7	0	0	0	1	1	4	0	1	7	1	7	6	16	12
Land Use	0	2	1	1	1	0	0	0	0	2	1	2	0	5	0	1	8	2	11	1	11	3	15	13
Natural Gas Use	4	3	0	1	0	0	0	0	0	3	0	14	0	0	1	0	0	0	5	1	5	11	21	9
Electricity Use	2	2	0	1	0	0	0	0	0	0	2	7	0	0	1	1	0	0	5	0.8	4	15	11	15
Water Use	0	0	2	2	0	1	0	7	0	1	0	6	0	0	2	1	2	0	6	1	6	8	18	11
Emergency Aspects																								
Site Fire		8		2		0		0		0		4		6		0		2					22	8
Seismic Event		2		1		1		10		6		5		1		0		0					26	6

Figure 8 Environmental Aspect Ranking Results, 2013

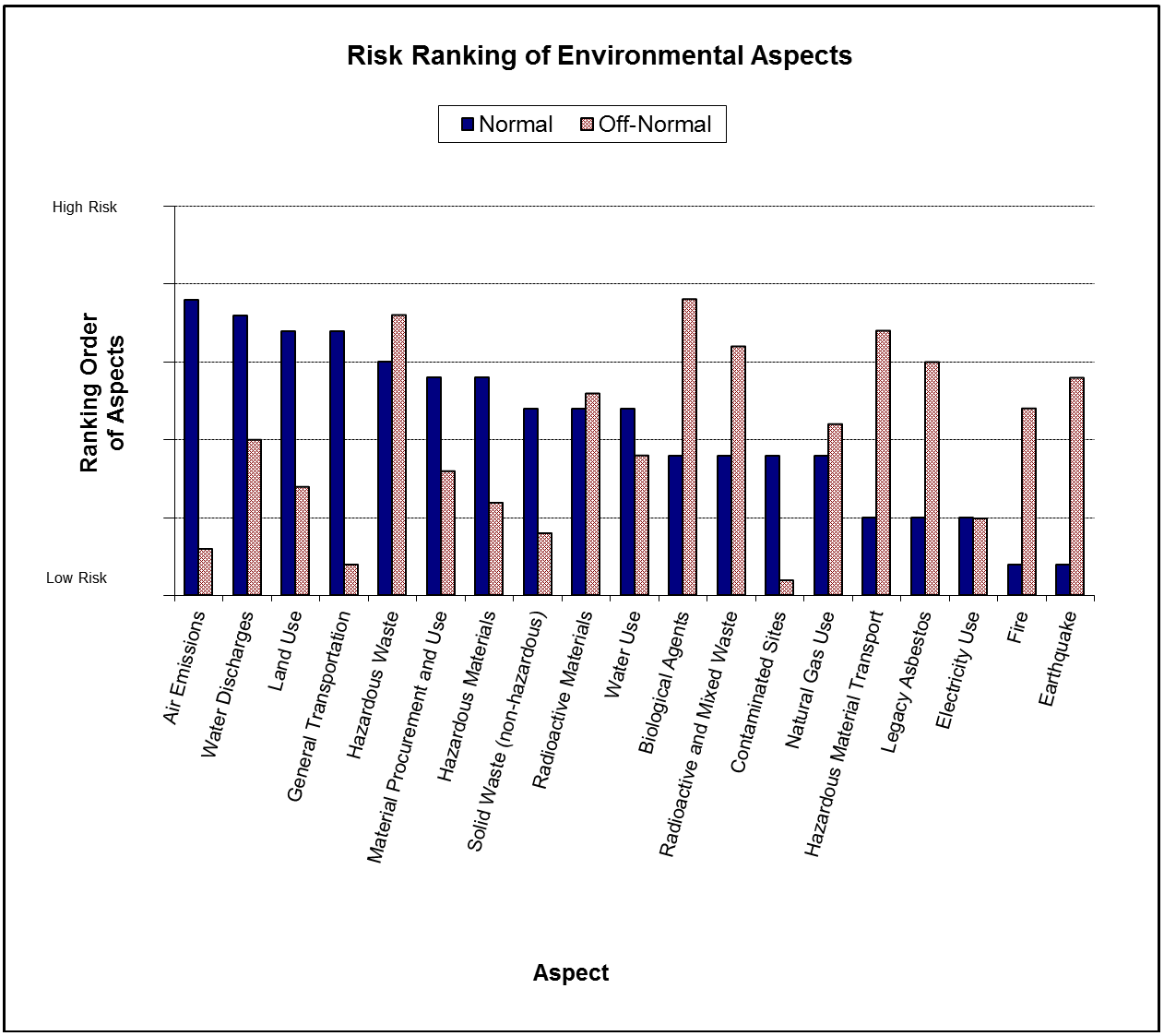

Figure 9 SNL/CA Aspect Ranking Summary

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6 Objectives and Targets

Setting objectives and targets, and establishing actions to help achieve these is a continuous cycle as shown in Figure 10. Objectives and targets provide a measure of environmental performance and the effectiveness of an EMS. SNL/CA's objectives support efforts to reduce potential environmental risk from site operations and enhance environmental stewardship. Our targets are detailed measurable performance requirements directly linked to site objectives. Each year, the EMS Core Team reviews EMS objectives and targets and evaluates the sites progress in meeting them. Targets are modified and new action items are established for the upcoming calendar year. As part of this review process, the Core Team identifies additional resources needed to implement current or future action items and submits an investment request through the budget cycle.

The site's senior management team (vice president and directors) are responsible for approving new EMS objectives and targets, and validating existing objectives and targets annually. The management team approved and validated the 2013 EMS objectives and targets on December 13, 2012.

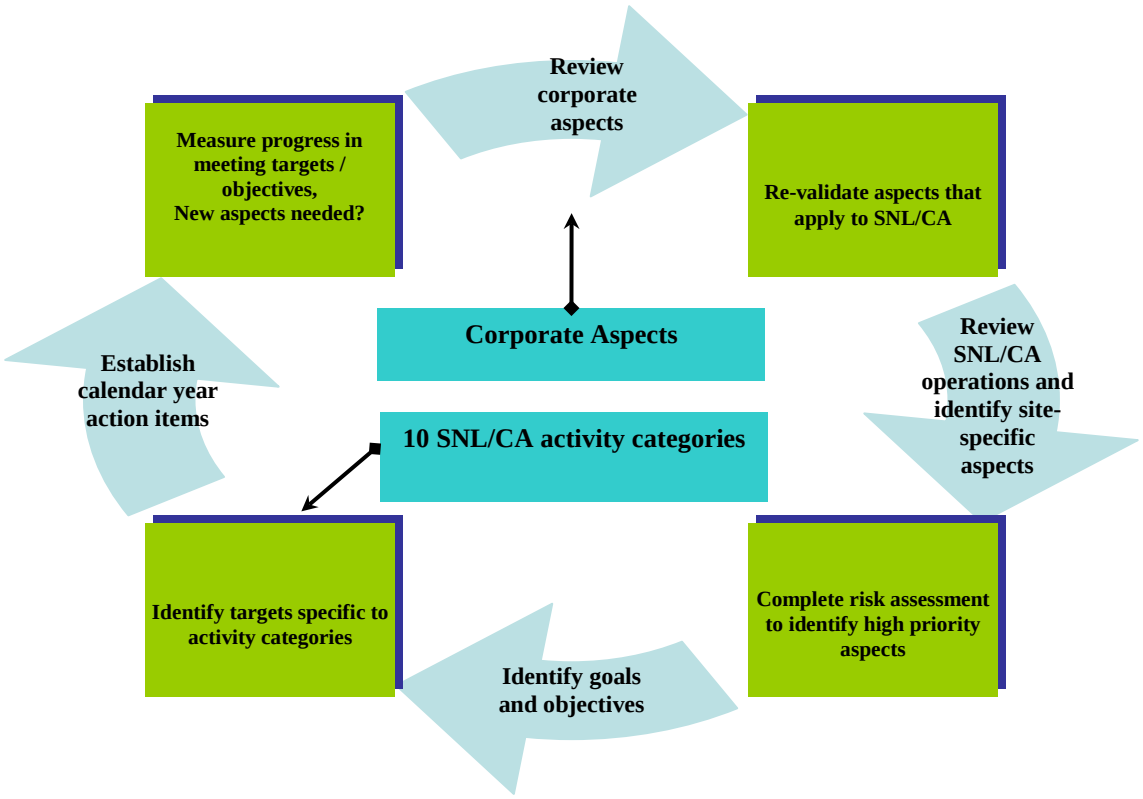

Figure 10 Cycle of Setting and Evaluating EMS Objectives and Targets

6.1 Defining Objectives

The ten broad objectives established in 2011 to support SNL/CA EMS activities were continued in 2013. EMS objectives are formed around the concept that the site's negative environmental impacts cannot be eliminated, in most cases, but should be minimized to the extent practical. For example, site operations will continue to generate waste, use hazardous materials, etc, but these can be managed to reach a minimum level appropriate to the level of operations and mission of the site. SNL/CA EMS objectives are shown in Table 5.

Table 5 SNL/CA EMS Objectives

Environmental Aspect/Area	Objective
All	Demonstrate exceptional environmental performance and management.
General Transportation Electricity Use Natural Gas Use Water Use	Minimize consumption (energy, water, non-renewable resources).
Hazardous Waste Legacy Asbestos Solid Waste Radioactive and Mixed Waste Water Discharges	Minimize the production of waste (non-hazardous, hazardous, radioactive, and wastewater).
Air Emissions General Transportation	Minimize air pollutants and greenhouse gas emissions.
Land Use	Preserve and, when possible, enhance the site's natural habitat.
Land Use Material Procurement and Use Electricity / Natural Gas Use Hazardous Materials	Design and manage all buildings and facilities using "green" principles.
Water Discharges	Maintain sewer effluent within regulatory discharge limits.
Water Discharges Contaminated Sites	Minimize the volume and pollution of storm water runoff and other water discharges.
Material Procurement and Use Hazardous Materials	Procure and use environmentally friendly products and materials.
Contaminated Sites Water Discharges Hazardous Materials	Minimize pollutants released to the ground or ground water (spills, landscape chemicals, metals, etc.)

6.2 Defining Targets and Assigning Actions

Annually, the EMS Core Team evaluates and identifies potential targets to support site environmental objectives. The Core Team identifies specific actions, timeframes, and personnel assignments needed to meet these targets. Completion of actions and progress towards meeting established targets is tracked on an actions / means document. A sample of this document is presented in Figure 11.

For 2013, SNL/CA is supporting nine corporate targets, with one minor modification, and one site target. Each of the five significant aspects applicable to SNL/CA activities are addressed in one or more of these targets. Fiscal year 2013 targets are:

- By FY15, reduce energy intensity by 30 percent from an FY03 baseline.
- By FY20, reduce Scope 1 and Scope 2 green house gas emissions by 28 percent from an FY08 baseline.
- By FY20, reduce scope 3 green house gas emissions by 13 percent from an FY08 baseline.
- By FY20, reduce water use intensity by 26 percent from an FY07 baseline.
- By FY20, reduce the use of diesel, gasoline, and E85 by 30 percent from an FY05 baseline.
- By FY15, increase fleet alternative fuel consumption by 10 percent per year from an FY05 baseline.
- By FY12, divert at least 80 percent of non-hazardous solid waste, excluding construction and demolition debris.[2]
- To the maximum extent practical install advanced metering for electricity (by October 2010), steam and natural gas (by October 2015), and standard meters for water.
- Achieve LEED (Leadership in Energy and Environmental Design) Gold for all new construction >$5M and compliance with HPSB (high performance sustainable building) principles for projects <$5M.
- By FY12, achieve a reduction in aged chemical inventory (<15% for chemicals aged between 10-15 years, <10% for chemicals aged > 15 years, 0% for manufacturers expired chemicals) (Site target).

[2] The corporate target for solid waste diversion is 65%, which SNL/CA has met the last two years. The target was modified for SNL/CA to support continued and expanded waste diversion.

FY2013 SNL/CA Environmental Actions (Means)

Below are actions approved to achieve environmental objectives.

Objective: Demonstrate exceptional environmental performance and management.

Action 1: Maintain ISO14001 certification of SNL/CA's Environmental Management System. (Shamber)
End of Year Status:

Action 2: Support the implementation of CA elements of the SNL FY2013 Site Sustainability Plan and other environmental plans, orders, etc, as required. (Royer, Taylor, Shamber)
End of Year Status:

Action 3: Establish informal Storm Water Working Group with Storm Water SMEs from LBL, LLNL, SNL/CA and SLAC. (Holland)
End of Year Status:

Action 4: Work with Centers to achieve SSHEAC-approved reduction targets for aged chemical for each center. (Brynildson)
End of Year Status:

Action 5: Achieve full compliance within 8500 of the established Division 8000 aged chemical targets. (Shamber)
End of Year Status:

Action 6: Achieve an overall Chemical Information System summer reconciliation of >95%. (Brynildson)
End of Year Status:

Action 7: Achieve a Chemical Information System summer reconciliation of 100% for the NFPA 704 health hazard rated 4 materials greater than 10% of laboratory scale quantities (4 lbs solid, 0.5 gal liquid, 1 lb gas). (Brynildson)
End of Year Status:

Figure 11 Sample of Actions/Means Document Supporting FY2013 Targets

7 Emergency Preparedness and Response

SNL/CA has an established Emergency Management Plan (SNL/CA 2011c) and procedures to provide an effective and timely response to emergency conditions. The site's Emergency Management Program was established in accordance with a separate DOE order, Order 151.1C, *Comprehensive Emergency Management System* (DOE 2005). SNL/CA's Emergency Management Plan establishes guidelines and procedures to mitigate the potential consequences of an operational emergency. The Emergency Management Program maintains implementing procedures for all assigned roles that support emergency events on site. SNL/CA conducts annual training exercises to validate elements of the Emergency Management Program. Routine training drills and communication tests are also completed. The Emergency Management Plan and Emergency Plan Implementing Procedures are available to the site workforce on SNL/CA's web site at http://info.sandia.gov/centers/8500/security/em.

Emergency response actions support our EMS Program by managing and mitigating the potential environmental risk from site operations. During site emergencies, environmental personnel provide support with hazardous materials spill response and clean-up. Through these efforts, potential long-term environmental effects are avoided or minimized.

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8 Environmental Functions

SNL/CA maintains an OHSEM Department that includes an environmental functional area with five functions supporting the site EMS Program. The Environmental Functional Area Lead and environmental subject matter experts from each of these five functions are part of the EMS Core Team responsible for developing, implementing, and modifying the site EMS. SNL/CA environmental functions are:

- Air Quality
- Environmental Monitoring and Ecology
- Environmental Planning
- Pollution Prevention and Waste Minimization
- Waste Management

The environmental functional area lead prepares an annual report that provides detailed information about all aspects of environmental operations. The annual report is provided on the SNL/CA OHSEM Department website at http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt.

Report contents include the following:

- A detailed summary of environmental function activities
- Regulatory drivers
- Operational controls
- Documents produced
- Job descriptions
- Training and competency
- Performance measures
- Quality assurance / risk assessment
- Self assessments
- Accomplishments in the last 12 months
- Issues
- Trends
- EMS Goals and objectives

The SNL/CA EMS Program also supports DOE and corporate sustainability goals for environmental, energy, and economic performance. In 2012, a team comprised of Facilities and Environmental staff from both sites updated the corporate Site Sustainability Plan to support DOE's sustainability goals. Sustainability initiatives are implemented at SNL/CA through the Project Engineering, Maintenance and Operations Organization when funding is available. The Site Sustainability Plan is available on the SNL/CA Environmental Management website (http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt).

8.1 Air Quality

The Air Quality Function provides compliance assistance for all nonradiological air emission sources at SNL/CA. Program staff review all directives, laws, and regulations relevant to air emissions for applicability to the site. This function manages the air permit process, from the initial steps of preparing permit applications through implementation of permit conditions and annual renewals. The Air Quality Program is responsible for evaluating proposed projects, assessing chemical use, and assessing emissions of all criteria pollutants and toxic air contaminants.

The Air Quality Function assists the site in complying with the Clean Air Act, California Air Resources Board (CARB) regulations, and local Bay Area Air Quality Management District (BAAQMD) regulations.

8.2 Environmental Monitoring and Ecology

The Environmental Monitoring and Ecology Function routinely monitors wastewater, storm water, and groundwater systems at SNL/CA to assess the effect of site operations on the public and local environment. Storm water is evaluated for general water quality, and for non-radiological and radiological constituents. Wastewater effluent resulting from site operations is monitored for non-radiological constituents. Liquid effluent control systems are operated and maintained by the program to capture wastewater from laboratory activities for analysis prior to release to the sanitary sewer. Groundwater is sampled and analyzed for non-radiological and radiological constituents to assess the extent of groundwater contamination from past operations. In addition, monitoring of external radiation at the site perimeter is conducted using thermo luminescent dosimeters. Comparisons are made of site data to offsite dose rates. The function also conducts project specific soil sampling to assess potential soil contamination from past or current operations and implements restoration activities, as needed. In addition, the Environmental Monitoring and Ecology Function provides oversight for ecological resource management coordinates and oversees wildlife, and vegetation surveys.

The Environmental Monitoring and Ecology Function assists the site in complying with federal requirements (Clean Water Act, National Emission Standards for Hazardous Air Pollutants Rule for Radionuclides); state of California requirements (Porter-Cologne Water Quality Act); and state and local permits for storm water and wastewater discharges. Environmental Monitoring also assists in compliance with the Endangered Species Act; Migratory Bird Treaty Act; California Endangered Species Act; and the Federal Insecticide, Fungicide, and Rodenticide Act (FIFRA), as it applies to wildlife and habitat.

8.3 Environmental Planning

The Environmental Planning Function oversees activities associated with site-level National Environmental Policy Act (NEPA) analyses, site-level ecological assessments, and cultural resources. Environmental Planning maintains responsibility for general environmental reporting that spans all five environmental functions.

The Environmental Planning Function assists the site in complying with the Endangered Species Act; California Endangered Species Act; National Historic Preservation Act; NEPA; DOE NEPA Implementing Procedures; and DOE Order 231.1 Environment, Safety, and Health Reporting.

8.4 Pollution Prevention and Waste Minimization

The Pollution Prevention and Waste Minimization Function promotes the elimination or reduction of all types of wastes generated at SNL/CA. Staff work closely with site organizations to establish routine and project specific recycling programs. The program provides guidance for resource and energy conservation and assists in identifying recycled-content products for use throughout the site.

The Pollution Prevention and Waste Minimization function assists the site in complying with the Pollution Prevention Act; Resource Conservation and Recovery Act (RCRA); and the California Hazardous Waste Source Reduction and Management Review Act.

8.5 Waste Management

The Waste Management Function manages hazardous, radioactive, and mixed wastes generated by SNL/CA operations. Waste Management personnel collect waste from the point of generation and transfer it to the Waste Management Facility for characterization, storage, consolidation, and packaging. Waste Management personnel establish and maintain contracts for offsite treatment and disposal of wastes, manage the RCRA permit process and implement conditions of the permit, conduct process knowledge evaluations to characterize waste types generated from specific operations, and provide training to all SNL/CA waste generators. This function evaluates new and ongoing operations for permit requirements and manages the hazardous waste permit process for applicable site operations, from the initial steps of preparing permit applications through implementation of permit conditions and periodic renewals. The Waste Management Function also manages medical waste permits and coordinates shipping of medical waste to an offsite treatment, storage, and disposal facility. In addition, the Waste Management function manages the universal waste program to ensure proper handling and disposal of universal hazardous waste such as batteries, consumer electronics, cathode ray tubes, and fluorescent tubes.

The Waste Management Function assists the site in complying with Federal requirements (RCRA, Toxic Substances Control Act, Federal Facilities Compliance Act, FIFRA); State of California requirements (Hazardous Waste Control Law, Medical Waste Management Act);

DOE orders for radioactive waste management and packaging and transportation of waste; and the RCRA Part B Permit for SNL/CA.

9 Legal and Other Requirements

SNL/CA is subject to many federal, state, and local environmental laws, regulations, and requirements. Sandia operations are also subject to DOE directives identified in Sandia Corporation's contract with DOE for management and operation of Sandia National Laboratories and Presidential executive orders. Sandia is committed to managing all activities in accordance with these policies, directives, and processes within the boundaries of the prime contract, applicable laws, and best management practices. As part of our mission, we strive to serve our customers by anticipating their needs, meeting their requirements, and exceeding their expectations. DOE and Sandia establish an annual performance evaluation plan that outlines the expectations for performance.

9.1 Current Requirements

Environmental requirements applicable to SNL/CA operations are detailed in annual program reports prepared for each environmental program area. Table 6 provides a list of primary environmental requirements that are applicable to each environmental aspect. In addition to the requirements listed in Table 6, DOE and Sandia establish a set of operational expectations each year. DOE's expectations of Sandia for 2013 can be found in the *Fiscal Year 2013 Performance Evaluation Plan for Sandia Corporation, Management and Operation of the Sandia National Laboratories*. The 2013 Performance Evaluation Plan includes a performance measure for maintaining effective and efficient ES&H programs.

Table 6 Primary Environmental Requirements Associated with Environmental Aspects

Environmental Aspect	Environmental Requirement
Water discharges (significant aspect)	ESH100 Environment, Safety & Health Policy, and related processes and procedures. Sandia Site Sustainability Plan 33 United States Code (USC) §1251, Clean Water Act 40 Code of Federal Regulations (CFR) 112, Oil Pollution Prevention 40 CFR 122 - 125, National Pollutant Discharge Elimination System 40 CFR 129 Toxic Pollutant Effluent Standards and Prohibitions 40 CFR 403 General Pretreatment Regulations for Existing and New Sources of Pollution 40 CFR 433 Metal Finishing Point Source Category Title 23 California Code of Regulations (CCR), Division 3 Title 17 CCR Public Health California Health and Safety Code (H&S Code), Division 20, Chapter 6.6, California Safe Drinking Water and Toxic Enforcement Act of 1986, Proposition 65
Air emissions (significant aspect)	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan Clean Air Act, 42 USC § 7401 40 CFR 61, National Emissions Standards for Hazardous Air Pollutants, Subpart H California H&S Code, Division 26 California Clean Air Act California Air Resources Board Regulations Bay Area Air Quality Management District Regulations Executive Order (EO) 12843, Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance California H&S Code, Division 25.5 § 38500 et. seq. California Global Warming Solutions Act of 2006

Environmental Aspect	Environmental Requirement
Land use (significant aspect)	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 4321 et. seq., National Environmental Policy Act 16 USC § 1531 et. seq., Endangered Species Act 16 USC § 703 et. seq., Migratory Bird Treaty Act 33 USC § 1251, Clean Water Act 7 USC § 136, Federal Insecticide, Fungicide, and Rodenticide Act 10 CFR 1022 Compliance with Floodplain and Wetlands Environmental Review Requirements EO 11988 Floodplain Management EO 11990 Protection of Wetlands EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance California Fish and Game Code §§ 2050 – 2068, California Endangered Species Act California Fish and Game Code Biological and Conference Opinion for SNL/CA Operations DOE Order 4700.1 Project Management System DOE Order 413.3 Program and Project Management for the Acquisition of Capital Assets EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management
General transportation (significant aspect)	Sandia Site Sustainability Plan Energy Policy Act of 2005 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
Hazardous waste (significant aspect)	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 6901 et. seq., RCRA 42 USC § 6961, Federal Facility Compliance Act 40 CFR 239 – 299, RCRA Implementing Regulations 29 CFR 1910.120, Hazard Communication Standard California H&S Code, Division 20, Chapter 6.5, California Hazardous Waste Control Law California H&S Code, Division 104, Part 14, §§ 117600 -118360, California Medical Waste Management Act Title 22 CCR California Implementing Regulations for RCRA 42 USC § 13101 et. seq., Pollution Prevention Act of 1990 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management California Hazardous Waste Source Reduction and Management Review Act of 1989 California H&S Code, Division 20, Chapter 6.5, Hazardous Waste Control California H&S Code, Division 20, Chapter 6.5, Waste Minimization Certification 15 USC § 2601 et. seq., Toxic Substances Control Act SNL/CA Hazardous Waste Facility Permit SNL/CA Part B Hazardous Waste Operation Plan
Hazardous materials	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 11001 et. seq., Emergency Planning and Community Right-to-Know Act 29 CFR 1910.1200 Hazard Communication Standard 29 CFR 1910.1450 Lab Standard 40 CFR 68 Risk Management Plan EO 12856 Federal Compliance with Right-to-Know Laws and Pollution Prevention Requirements DOE Order 151.1C Emergency Management California H&S Code, Chapter 6.95, California Hazardous Materials Release Response Plans and Inventory Law EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management California H&S Code Division 20, Chapter 6.7, Underground Storage Tanks 42 USC § 6901 et. seq. RCRA (related to underground storage tanks) 40 CFR 280 RCRA Implementing Regulations for Underground Storage Tanks 15 USC § 2601 et. seq., Toxic Substances Control Act 7 USC § 136, Federal Insecticide, Fungicide, and Rodenticide Act

Environmental Aspect	Environmental Requirement
Material procurement and use	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Sandia Site Sustainability Plan DOE Order 413.3 Program and Project Management for the Acquisition of Capital Assets EO 12843, Procurement Requirements and Policies for Federal Agencies for Ozone-Depleting Substances EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance 42 USC § 6901 et. seq., Resource Conservation and Recovery Act (RCRA)
Radiological materials	42 USC § 2011 et. seq., Atomic Energy Act ESH100 Environment, Safety & Health Policy, and related processes and procedures MN471016 Radiological Protection Procedures Manual DOE Order 458.1, Radiation Protection of the Public and Environment DOE/EH-0173T, Environmental Regulatory Guide for Radiological Effluent Monitoring and Environmental Surveillance 10 CFR 835, Radiological Protection
Radioactive and mixed waste	ESH100 Environment, Safety & Health Policy, and related processes and procedures 42 USC § 2011 et. seq., Atomic Energy Act DOE Order 435.1 Radioactive Waste Management DOE Order 458.1 Radiation Protection of the Public and the Environment 42 USC § 6961, Federal Facility Compliance Act SNL/CA Hazardous Waste Facility Permit SNL/CA Part B Hazardous Waste Operation Plan California H&S Code, Division 20, Chapter 6.5, Hazardous Waste Control Law Nevada Test Site Waste Acceptance Criteria
Biological agents	ESH100 Environment, Safety & Health Policy, and related processes and procedures SNL/CA Biohazardous Waste Management Plan SNL/CA Medical Waste Management Plan
Contaminated sites	ESH100 Environment, Safety & Health Policy, and related processes and procedures California Regional Water Quality Control Board, San Francisco Bay Region Waste Discharge Requirements
Legacy asbestos	ESH100 Environment, Safety & Health Policy, and related processes and procedures 40 CFR 61, National Emissions Standards for Hazardous Air Pollutants 15 USC § 2601 et. seq., Toxic Substances Control Act
Solid waste (non-hazardous)	ESH100 Environment, Safety & Health Policy, and related processes and procedures Sandia Site Sustainability Plan 42 USC § 13101 et. seq., Pollution Prevention Act of 1990 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management California Public Resources Code § 42961.5, Waste Tire Manifest Program California H&S Code Division 20, Chapter 6.5, § 25211, Appliance Recycling Title 22 CCR Division 4.5, Chapter 16, Recyclable Materials Title 22 CCR, Division 4.5, Chapter 23, Universal Waste Management Title 22 CCR, 66273, California Electronic Waste Recycling Act California Public Resources Code §§ 42490 – 42499, Cell Phone Recycling Act EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
Hazardous material transportation	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Order 460.1B, Packaging and Transportation Safety 49 CFR - Transportation SNL/CA Transportation Safety Document SNL/CA Transportation Security Plan
Natural gas use	Sandia Site Sustainability Plan Energy Policy Act of 2005 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
Water use	Sandia Site Sustainability Plan EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance
Electricity use	Sandia Site Sustainability Plan Energy Policy Act of 2005 EO 13423, Strengthening Federal Environmental, Energy, and Transportation Management EO 13514, Federal Leadership in Environmental, Energy, and Economic Performance

Environmental Aspect	Environmental Requirement
Fire (emergency aspect)	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Order 151.1C, Emergency Management
Earthquake (emergency aspect)	ESH100 Environment, Safety & Health Policy, and related processes and procedures DOE Order 151.1C, Emergency Management

9.2 Monitoring Requirements

The process for monitoring ES&H requirements is identified in Administrative Procedure (AOP 04-02 (SNL 2009). At the corporate level, Sandia monitors DOE directives, DOE Acquisition Regulation activity, Federal Register, and federal, state, and local government publications for regulatory changes and issues applicable to SNL operations. New requirements are communicated to the workforce through established internal mechanisms and incorporated into Sandia ES&H processes and procedures. New requirements are then incorporated into facility- and operation-specific work planning and control documents.

Environmental subject matter experts (SMEs) at SNL/CA monitor state and local issues to augment corporate monitoring. Subscriptions to electronic and paper publications and interactions with regulators are two primary ways that SNL/CA's SMEs stay current on environmental requirements. SNL/CA SMEs work directly with regulating agencies to obtain information on new and changing requirements well in advance of requirements becoming effective. Such advance notice allows the SNL/CA EMS Core Team to identify resources and implement effective and cost efficient processes for compliance. When budgets allow, environmental staff members attend conferences to keep abreast of regulatory changes.

SMEs at both SNL/CA and SNL/NM interact regularly with their DOE counterparts and regulators. Through these customer and stakeholder interactions, some changes (i.e., executive orders and policies, applicable litigation results, best management practices, etc.) may be identified that are not incorporated into Sandia's Management and Operating Contract (M&O Contract) as formal requirements. Although such changes are not necessarily contract requirements, where appropriate, they are incorporated into the EMS and implemented through environmental functions. However, because this process is informal, some changes that may be appropriate may not be captured.

9.3 Recent Modifications to Requirements

Table 7 summarizes information from the annual environmental functional area report pertaining to new and modified environmental requirements that were recently issued or are pending over the next few years.

Table 7 New and Modified Environmental Requirements

Function	Requirement Summary	Effective Date	Requirement	Modification
Pollution Prevention / Waste Minimization	Businesses (including public entities) that generate 4 cubic yards or more of trash per week must include discarded food and compostable paper in solid waste recycling efforts	July 1, 2014	Alameda County Ordinance 2012-1	Additional waste streams will need to be added to the recycling program
Waste Management Pollution Prevention/ Waste Minimization	Requires SNL/CA to verify with their primary recycler that cathode ray tubes (CRTs) are actually recycled by the primary recycler under contract to Sandia. If this is not the case, and a secondary recycler is used, then this must be stated in the contract.	October 15, 2012	Title 22, California Code of Regulations, Section 66273.72	The contract for recycling CRTs was modified to include the appropriate regulatory language

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10 Operational Control

Sandia maintains a Corporate Policy System that reflects the requirements of its contract with DOE and is consistent with the intent of Lockheed Martin Corporate Policy (Sandia's parent company). The Corporate Policy System governs all Sandia operations and it is part of Sandia's Integrated Laboratory Management System. Operational controls for the site are further enhanced with division and project-specific technical work documents.

10.1 Corporate Controls

The Corporate Policy System contains nine policy areas and three levels within each area. The nine policy areas include corporate governance, ES&H, facilities, finance, human resources management, information management, integrated safeguards and security, mission execution, and supply chain management. The policy system levels are: Level 1 Corporate Policies; Level 2 Corporate Processes; and Level 3 Corporate Procedures. All policies, processes, and procedures require review at least every three years.

Many of the Corporate Policy System requirements support the SNL/CA EMS Program. References to specific corporate policy system requirements are made throughout this manual when appropriate.

10.1.1 ES&H Policy Area (ESH100)

The ES&H Policy Area provides the processes and procedures for implementing environmental requirements throughout Sandia. It includes four broad processes focused on planning work, analyzing and controlling hazards, performing work, and providing feedback and improvement. Each process is supported by an extensive set of corporate procedures with requirements that flow down to all members of the workforce. Corporate ES&H policy, processes, and procedures are supplemented by site-specific process requirements when needed to address state and local requirements that are applicable at SNL/CA.

10.2 Local Work Planning and Control

SNL/CA maintains a variety of operational controls that are site specific. These include a Division 8000 work planning and control procedure, activity-specific technical work documents, an ES&H, Facilities, and Security Interdisciplinary Team, environmental permits and compliance documents, and contract specifications. The process used at SNL/CA for work planning and control is depicted in Figure 12 and documented in Administrative Procedure AP800015 (SNL/CA 2012c). The process follows ES&H process steps to plan work, analyze hazards, control hazards, perform work, and improve. Relevant significant environmental aspects for specific activities are determined during analyses of hazards.

10.2.1 Primary Hazard Screening (PHS)

The initial step in identifying operational controls is accomplished through Sandia's PHS process. The PHS is an online tool used to identify potential hazards associated with new and continuing activities. Through execution of the PHS tool, technical work documents, training, and personal protective equipment are identified to control safety conditions and environmental releases. All active PHSs are reviewed and updated annually. At SNL/CA, the Facility Management Coordinators assist the site workforce with preparation and update of PHSs. The PHS database is available online to all Sandia workers at http://info.sandia.gov/esh/phs/.

10.2.2 Job Safety Analysis

Another tool used to identify specific and unique hazards and environmental concerns for an activity is the job safety analysis. SNL/CA uses a graded approach to determine need for more detailed analysis and to ensure that the level of analysis is commensurate with the scope of the activity. Through this process, additional training, personal protective equipment, administrative controls, or engineered controls may be identified for an activity as a whole or for a critical step. Participants in the analysis process include staff from the OHSEM Department along with the work planner.

10.2.3 Interdisciplinary Team Evaluation

The Interdisciplinary Team (IDT) evaluation is an element of the work planning and control process. The focus of the evaluation is to assist work planners in planning proposed work, in identifying and evaluating associated risks and requirements, and then in identifying resources and subsequent actions necessary to mitigate associated risks and assure compliance with all applicable regulations and policies. The IDT evaluation relies on representatives from the Major Functional Areas of ES&H, Security, Quality, Emergency Management, and Facilities to verify the effectiveness and completeness of the planning, analysis and control of work activities, and to ensure SME involvement in the initial planning, design, and eventual execution of work activities. The IDT process has been used for more than fifteen years and is recognized by internal and DOE stakeholders as a successful best management practice and operational control mechanism. Additional information about IDT is provided in Chapter 14.

10.2.4 Technical Work Documents

Technical work documents are required for all operations. The procedure for preparing and maintaining technical work documents is identified in Corporate Procedure ESH100.2.GEN.3 Develop & Use Technical Work Documents (SNL 2012c). Technical work documents are used to define administrative and engineered controls required to address the hazards identified through the PHS and the job safety analysis. Technical work documents include operating procedures, standard operating procedures, safe work permits, and radiological work permits. These documents are updated every one to three years, or more frequently as needed. Technical work documents are maintained in an online database that can be found at https://sharepoint.sandia.gov/sites/eshdoc/SitePages/Home.aspx.

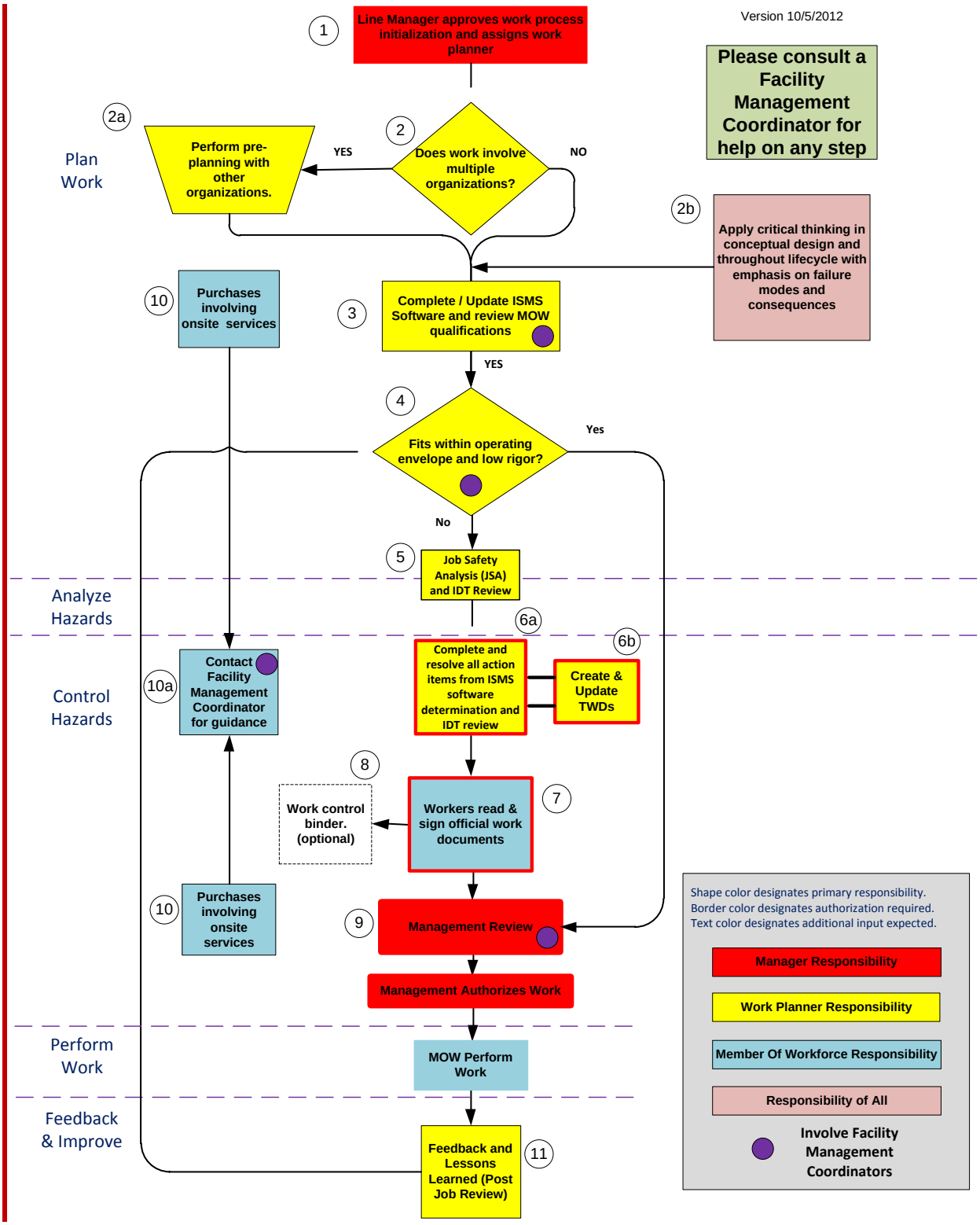

Figure 12 SNC/CA ES&H Review Process

10.2.5 Environmental Permits and Compliance Documents

Environmental permits and compliance documents function as activity-specific operational controls. They provide conditions under which the SNL/CA site may operate to meet federal, state, and local environmental regulatory requirements. Table 8 provides a list of the permits and documents valid in 2013.

Table 8 Environmental Permits and Compliance Documents, 2013

Type	Description	Statute / Regulation	Agency /Authority
Air	Permit to Operate emission sources (14 sources for 2012/2013)	Clean Air Act	BAAQMD
Environmental restoration	Site Clean-up Order No. 89-184	California Water Code	Regional Water Quality Control Board, San Francisco Bay
Hazardous materials	Business Plan Permit to Operate	California Health and Safety Code	Livermore-Pleasanton Fire Department
Hazardous waste	RCRA Hazardous Waste Facility Permit	RCRA	California Department of Toxic Substances Control
Hazardous waste	Permit by Rule (2 operations)	RCRA	Livermore-Pleasanton Fire Department
Hazardous waste	Conditionally Authorized Permit to Operate (2 operations)	California Health and Safety Code	Livermore-Pleasanton Fire Department
Medical waste	Small Quantity Generator with Onsite Treatment	California Health and Safety Code	Alameda County Environmental Health Department
Medical waste	Small Quantity Generator without Onsite Treatment	California Health and Safety Code	Alameda County Environmental Health Department
Wastewater	Wastewater Discharge Permit	Clean Water Act	City of Livermore Water Reclamation Plant
Storm water	State of California General Industrial Permit	Clean Water Act	State of California Water Resources Control Board
Jurisdictional waters of the U.S.	Channel improvements under the Arroyo Seco Improvement Program	Clean Water Act	Army Corp of Engineers
Underground storage tank	Permit to Operate	Resource Conservation and Recovery Act and California Health and Safety Code	Livermore-Pleasanton Fire Department
Aboveground storage tanks	Permit to Operate	Aboveground Petroleum Storage Act	Livermore-Pleasanton Fire Department
Environmental assessment	Final Site-wide Environmental Assessment of the SNL/CA	NEPA	DOE
Biological resources	Biological and Conference Opinion for SNL/CA	Endangered Species Act	U.S. Fish and Wildlife Service
Universal waste	Generator statement	California Electronic Waste Recycling Act, 22 CCR § 66273	California Department of Toxic Substances Control

10.2.6 Contract Specifications

SNL/CA's contract specifications function as operational controls for contracted work activities. An SNL/CA specific environmental specification consolidates all environmental requirements applicable for construction activities into one document. An environmental permit is also included as part of the bid package to identify check points and contacts for various activities. Contractors are also required to report to SNL/CA on their efforts in waste reduction, recycling, and reuse of materials.

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11 Document Control

11.1 Corporate Documents

The Information Management Policy Area (IM 100) identifies the process and procedures for managing and protecting Sandia information (SNL 2013c). The official version of all corporate policies, processes, and procedures is the electronic version maintained on the Sandia internal website. These documents are disseminated to the workforce exclusively through the Corporate Policy System. They are reviewed and updated at least every three years. Each document is assigned an Executive Policy Sponsor. Only the sponsor or their delegate can approve changes to these documents.

11.2 Technical Work Documents

ES&H requirements and concerns related to activities and operations at SNL/CA are addressed through technical work documents such as operating procedures, hazard assessments, safety plans, and other similar documents. Technical work documents are marked with an issue identifier for version control, date of publication, review period, and renewal date. The most current version of technical work documents is maintained in an online database. Technical work documents contain authorized users lists. Personnel must read updated versions when issued and sign the authorized users list indicating their understanding and agreement to operate in accordance with new and modified procedures. Outdated versions are removed from the online system when new versions are issued to prevent unintended use of electronic obsolete documents.

To prevent unintended use of a printed copy of an obsolete document, a note is included on each page to indicate that any printed copy may not be the most current, even if the date on the procedure is still current. Managers are responsible for ensuring that printed documents maintained at point of use are current. Obsolete documents maintained in the ES&H Records Center are stamped as superseded when updated versions are filed in the Records Center.

11.3 Environmental Documents

EMS program and other environmental documents are controlled by the OHSEM Department (Organization 8516). These documents are reviewed annually as part of the EMS assessment process outlined in AP800005 (SNL/CA 2012b). Each environmental subject matter expert controls and approves changes to their documents. The department manager controls and approves changes to EMS-specific documents. Current versions are maintained in active records storage electronically in the corporate digital database or paper copy in the ES&H Records Center, and displayed on the SNL/CA ES&H web site. Paper copies are not distributed to the workforce.

Environmental documents of external origin (e.g. permits, regulatory authorizations, etc.) are maintained by the OHSEM Department. Many of these documents are marked as valid for a specified period of time. Environmental subject matter experts coordinate updates to external documents to ensure that documentation remains current. Permits and other regulatory authorizations that require posting at point of use are controlled and distributed by environmental subject matter experts to ensure that obsolete documents are not used unintentionally.

12 Competence, Training, and Awareness

12.1 SNL/CA Members of the Workforce

Members of the workforce at SNL/CA include Sandia employees and onsite contractors. Onsite contractors are individuals that perform work activities under the direction of a Sandia employee pursuant to the terms of their contract.

12.1.1 Members of the Workforce - Competence

It is Sandia's policy to select the best qualified individuals for employment on the basis of demonstrated competence and to provide opportunities for, and encourage, professional development. For onsite contractors, specific competencies required for each position are identified in the scope of work and verified through the contractor selection process.

For activity level work, SNL/CA applies skill of the worker / skill of the craft to demonstrate that an individual is qualified and holds the appropriate competencies to perform assigned tasks. Skill of the worker job qualifications are documented in a Job Qualification / Worker Authorization Form in accordance with the site work planning and control process. Skill of the craft qualifications specific to the Facilities Engineering, Maintenance, Logistics, and Operations Department are documented in a skill standard.

Each of the five SNL/CA environmental functions (Chapter 8) supporting the site's EMS Program maintain job descriptions and qualifications for each job assignment. Subject matter experts review job descriptions and qualification requirements annually, update them as needed, and document the results of the review in the annual environmental functional area report. The annual review and update provides an opportunity to modify and identify new competencies needed to support new or changing requirements.

12.1.2 Members of the Workforce - Training

Sandia employees are subject to all corporate policies, processes, and procedures and are expected to maintain compliance with training requirements at all times. Training requirements for onsite contractors are identified in the contract. Onsite contractors are also expected to maintain compliance with training requirements at all times. Sandia maintains a set of general corporate training courses that cover a wide range of areas such as information and physical security, business ethics and diversity, ES&H, and general business processes. Many of these are also applicable for onsite contractors. General corporate training requirements are assigned automatically at the time of hire (or placement of contract). Job, function, and organization specific training is identified by the responsible manager. Sources that are used to identify training requirements may include the PHS and job safety analysis discussed in Section 10.

Sandia maintains an online Corporate Learning Management System (known as TEDS) at https://hrprod.sandia.gov/cfdocs/prod/hris/ctd/apps/cedtweb/cedtmain/index.cfm to track completion status for all corporate training requirements and to provide electronic reminders to members of the workforce and their manager when a course is due. Job-specific training courses can also be added to TEDS for tracking purposes.

In addition to the training requirements discussed above, OHSEM Department staff are often subject to regulatory training requirements for a specific job function. These requirements are listed in the annual environmental functional area report. New and modified training requirements are identified during the annual review process or as part of the requirements monitoring process presented in Section 9.

12.1.3 Members of the Workforce – EMS Awareness

SNL/CA provides general EMS awareness training to the site work force through the following mechanisms.

- New-hire orientation is a one-time basic orientation to ES&H for members of the workforce.
- ESH100 is an annual training requirement for the site workforce.
- ENV112CA is an annual training requirement for generators of hazardous waste at SNL/CA.
- Presentations tailored to site organizations.
- Discussions at department and functional program group meetings (Environmental staff)

12.2 Visitors - Training and Awareness

The level of training required for visitors is dependent on the length of stay and activity that they will perform. ES&H training for visitors at SNL/CA is addressed in an attachment to Corporate Procedure: ESH100.2.GEN.2 Determine, Complete, and Document Required ES&H Training (SNL 2012a). Sandia hosts and their managers determine the level of training required for visitors. At a minimum, visitors performing hands-on work in SNL/CA facilities receive ES&H awareness training. Laboratory- and equipment-specific training is also provided for visiting researchers performing hands-on work at SNL/CA user facilities. For general EMS awareness, environmental information is posted and available to visitors at the Badge Office.

12.3 Project-Specific Construction Contractors

Project-specific construction contractors perform work at SNL/CA under established contract specifications that include specialized training, credential, or certification requirements. Construction contractors must submit an Injury Illness Prevention Program and a Job Risk Analysis for review by SNL/CA's Construction Safety Engineer. Work does not begin until these documents are approved by Sandia. A Preliminary Risk Assessment prepared by Sandia is also included in contract documents. The risk assessment identifies specific environmental issues, such as air quality, waste management, and storm water pollution prevention that are applicable to a specific project.

SNL/CA requires contractors to provide a project safety officer when conducting work at Sandia, and to provide written documentation that the safety officer meets the qualifications defined in the contract specifications. Additionally, specifications require contractors to maintain appropriate contractor training records and make available to Sandia oversight personnel upon request.

Non-routine construction projects or construction-like activities at SNL/CA are presented to the ES&H IDT for review. The IDT process functions both as an awareness and compliance mechanism. SNL/CA executes the IDT process to identify ES&H requirements and to disseminate EMS information to the respective SNL Project Manager. Requirements and other applicable information identified during the IDT review are provided to contractors through contract specifications and during the safety plan review process. A pre-construction conference is held to determine if the pre-work contract requirements have been met (e.g. approved safety plan, activity risk assessment, construction site requirements, etc.). Environmental staff routinely attend pre-construction conferences to provide awareness training on topics of concern such as storm water pollution prevention, wildlife, and recycling/reuse of materials.

Sandia provides oversight throughout the length of projects. Oversight personnel identify non-conformances through deficiency notices, non-compliance notices, and safety violation notices. All non-conformance notices are tracked by Sandia and used during evaluations for contract renewals.

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13 Environmental Monitoring and Measurement

Each SNL/CA environmental function routinely monitors and measures the key characteristics of site operations that can affect the environment. Monitoring and measurement information supports our compliance requirements as well as assessment of overall progress in meeting site environmental objectives. For instance, the Environmental Monitoring and Ecology Function routinely samples and analyzes wastewater and storm water for contaminants of concern and other parameters. Data collected provide a measure of the quality of water discharges that can be used to determine if site operations meet permit conditions (compliance), or minimize pollutants in sewer water (wastewater discharge objective). Program leads report the monitoring results as site metrics and publish these on the SNL/CA ES&H webpage. Table 9 identifies the monitoring activities conducted at SNL/CA and the EMS objective that the activities support.

Table 9 EMS Monitoring Activities

Key Characteristics of Site Operations	Monitoring Activity	Supports EMS Objective
Laboratory wastewater discharges	Routine sampling/analyses of sewer water; weekly monitoring of continuous flow meter at sewer outfall	Minimize production of waste (including wastewater) Maintain sewer effluent within regulatory discharge limits. Minimize volume and pollution of storm water runoff and water discharges
Industrial and construction activities	Routine sampling/analyses of storm water (2 storm events per year)	Minimize volume and pollution of storm water runoff and water discharges Minimize pollutants released to the ground or ground water
Emissions generated from site operations	Annual reporting of greenhouse gas emissions	Minimize air pollutants and greenhouse gas emissions Minimize consumption
Material procurement and use	Monitor projects for affirmative procurement purchases	Procure and use environmentally friendly products and materials Design and manage all buildings and facilities using “green” principles
Use of land where sensitive wildlife and habitat are present	Monitor habitat improvements from Arroyo Seco project and compare against success criteria	Preserve and, when possible, enhance the site’s natural habitat
Commuter site	Periodic survey of site population on use of commute alternatives	Minimize air pollutants and green house gas emissions Minimize consumption
Use of fuel in onsite vehicles / equipment	Annually monitor use of liquid transportation fuels	Minimize air pollutants and green house gas emissions Minimize consumption
Hazardous and biological material use	Annually conduct chemical inventory reconciliation	Procure and use environmentally friendly products and materials
Hazardous waste generation	Monitoring of quantities and types of hazardous waste generated	Minimize the production of waste
Radioactive and mixed waste generation	Monitoring of quantities and types of radioactive and mixed waste generated	Minimize the production of waste
Solid waste generation	Monitoring of quantities of solid waste generated and quantities and types of materials recycled	Minimize the production of waste

Key Characteristics of Site Operations	Monitoring Activity	Supports EMS Objective
Use of energy and water resources	Monitoring of resources used	Minimize consumption Minimize air pollutants and greenhouse gas emisisons
Previously contaminated areas	Monitoring of groundwater at previously contaminated areas	Minimize pollutants released to the ground or ground water

13.1 EMS Metrics

SNL/CA uses various metrics to measure environmental affects or impacts from site operations. Additionally, SNL/CA established metrics to measure general environmental management and awareness. Table 10 provides a list of site EMS metrics. Graphical representation of each metric is displayed on the SNL/CA Environmental Management website at http://info.sandia.gov/centers/8500/esh/CA-EnvMgmt/metrics.

Table 10 List of EMS Metrics

Impact Metrics	EMS Management Metrics
Recycling	Environmental violations, findings, DOE occurrences
Fuel use	NEPA reviews
Energy use / cost	Site chemical inventory
Sewer flow	Chemical inventory reconcilliation
Sewer water contamination	NFPA health 3 & 4 containers
Storm water system controls	
Water use	
Hazardous waste	
Hazardous waste chemical spills	
Radioactive waste	
Landfill waste	

14 Evaluating Compliance with Environmental Requirements

Compliance evaluations are supported by a wide variety of audits. Implementation of requirements across all SNL/CA operations, as well as management processes, are evaluated through internal and external audits. Audit results are maintained as Sandia records either in the ES&H Records Center or in an online database. Table 11 identifies the types of audits routinely conducted for SNL/CA operations, and the records that result from each.

In 2006, SNL/CA's EMS Program received registration under the international standard for environmental management systems, ISO 14001:2004. The ISO 14001:2004 standard requires routine audits by an independent registrar and re-registration every three years. In May 2012, SNL/CA received a second re-registration for an additional three-year period.

Table 11 SNL/CA Environmental Audits

Type	Guidance Document / Driver	Conducted By	Schedule	Scope	Record Type	Record Maintenance
Internal						
Division 8000 Self Assessments	AP800033	VP, Directors, Managers	Monthly	Select ES&H areas	Assurance Information System	Online and SNL/CA ES&H Records Center
Environmental Function Audits	AP800005	Environmental SMEs	Annual	Adequacy and effectiveness of processes, adequacy of resources, communication of requirements, line ownership of requirements	Assurance Information System	Online and SNL/CA ES&H Records Center
EP Representative Line Audits	AP800005, AP800008	EP Representative	Routine / ongoing	Informal, focus on critical environmental requirements and trouble spots	Assurance Information System	Online and SNL/CA ES&H Records Center
EMS Mgmt Representative EMS Audit	AP800005	EMS Mgmt Representative	Annual	Review of all EMS elements	Assurance Information System	Online and SNL/CA ES&H Records Center
External						
External regulating agency audits and inspections	Federal, state, and local regulations and permits	Regulatory Inspectors	Annual	All aspects of facility operations, record keeping, program processes, and adherence to permit conditions / requirements, audits are generally unplanned and unannounced	Official correspondence	SNL/CA ES&H Records Center
DOE audits	M&O Contract, DOE policies and requirements	DOE auditors	Annual	Subset of ES&H programs audited each year	Audit report	SNL/CA ES&H Records Center
Corporate Audits	CG100.6	Assessment teams	Varies	Select ES&H areas or laboratory systems	Audit report	SNL/CA ES&H Records Center
Non-government audits	M&O Contract, discretionary	varies	varies	Select ES&H areas	Audit report	SNL/CA ES&H Records Center
Third party certification	ISO 14001	External third party auditor	Recertify every three years; surveillance annually	Requirements of the ISO 14001 Standard	Audit report	SNL/CA ES&H Records Center

15 EMS Internal Audit and Self-Assessment

Annually, Sandia staff complete an internal audit of the EMS Program to determine if it conforms to the ISO 14001 Environmental Management System standard, and to ensure that it is properly implemented and maintained. Additionally, the various audits described in Chapter 14 support management and maintenance of the EMS. SNL/CA maintains an administrative procedure for conducting audits used in support of the EMS Program (SNL/CA 2012b). Figure 13 summarizes the audits that assist in keeping SNL/CA's EMS on track.

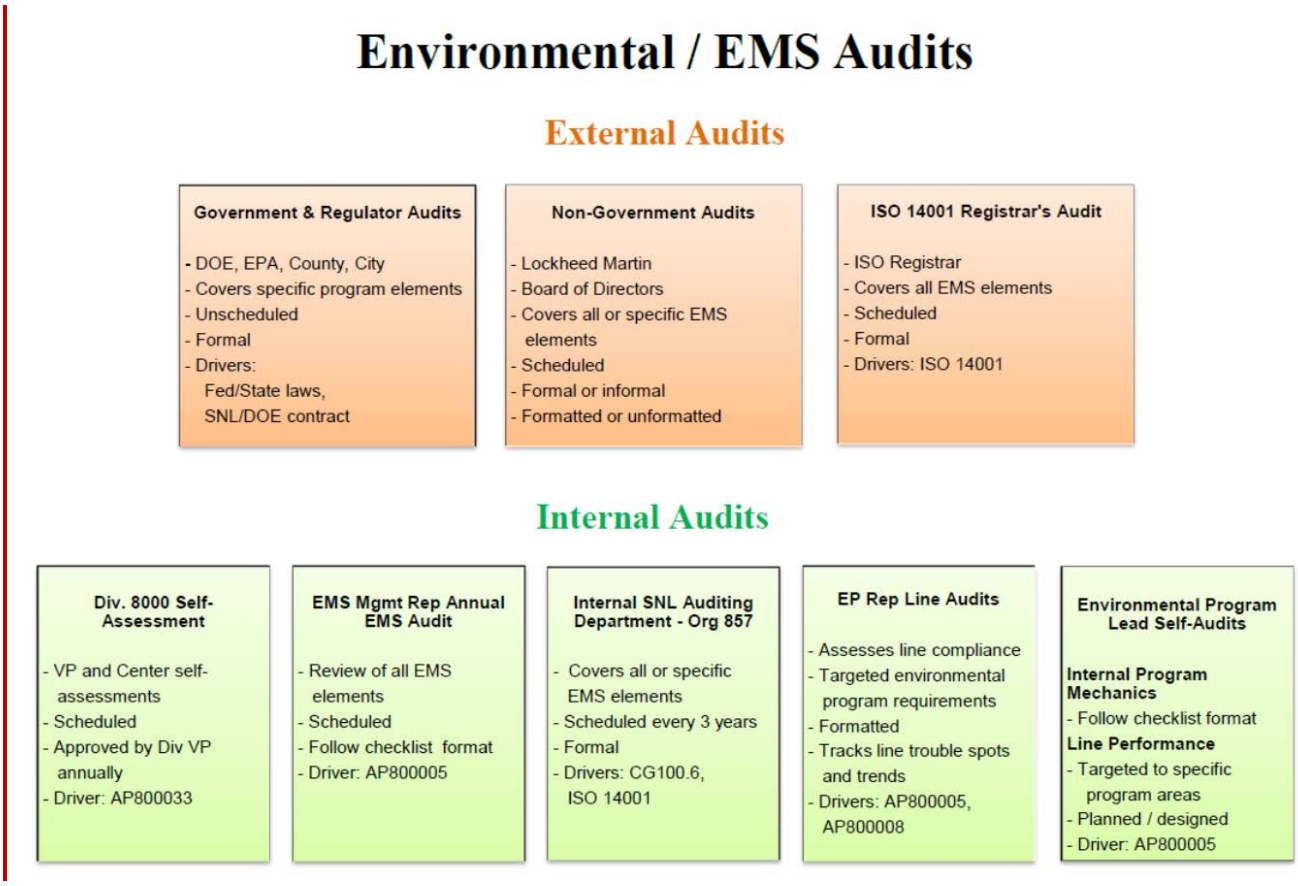

Figure 13 Audits Supporting SNL/CA's EMS Program

15.1 EMS Audits

Sandia's corporate audit team in the ES&H, Safeguards & Security, and IT Operations auditing organization (Organization 857) conducts periodic audits of SNL/CA's EMS Program. These audits are completed every three years to evaluate the EMS Program against the requirements of

the ISO 14001 standard. The most recent audit against ISO 14001:2004 requirements was conducted in September 2011. During interim years, the EMS Core Team completes a gap analysis of select ISO elements. The gap analysis provides a broad look at requirements rather than an in-depth comparison against the details of the ISO standard. Audit reports and gap analyses are EMS records and maintained in the ES&H Records Center.

15.1.1 2013 Audit

The EMS Core Team completed a gap analysis in March 2013. Several supporting documents were identified as out of date due to recent changes in the corporate assessment database and a change in the site Vice President. Updating of these documents is underway and expected to be completed by June 2013.

15.2 EMS Management Representative Review

The primary internal method of review used for the EMS Program is the annual EMS Management Representative review. Other audits may also be used to evaluate the EMS Program, including corporate and DOE audits. EMS Program review results are EMS records and maintained either electronically in the corporate records database or in paper form in the ES&H Records Center.

The EMS Management Representative review was completed in January 2013. The review found that the SNL/CA EMS requires a few updates to reflect changes in site management and minor improvement actions. Complete EMS review results are documented in the Assurance Information System.

16 Nonconformity, Corrective, and Preventive Action

SNL/CA maintains a procedure for identifying nonconformities through a system of internal and external audits. Administrative Procedure AP800005, *Environmental Management System Audit Process* (SNL/CA 2012b) describes the various audits that are conducted to assess site compliance with environmental regulations and requirements, and continually improve the site EMS. The procedure also describes scheduling, tracking, and management of results. Audits conducted at SNL/CA are described in Chapters 14 and 15 of this manual.

16.1 Audit Tracking

SNL/CA environmental and EMS-related audits are tracked and documented in one of two databases: the Assurance Information System (AIS) or the OHSEM Department Audit Summary spreadsheet. AIS is an online corporate system. The Audit Summary spreadsheet is an OHSEM Department tool used to track all audit actions in one central location.

16.2 Corrective and Preventive Action

The EMS Core Team evaluates the results of environmental and EMS-related audits to identify corrections and corrective or preventive actions. Whereas corrections are those actions to correct the immediate actual or potential nonconformity, corrective or preventive actions are the actions taken to eliminate the cause of the actual or potential nonconformance and prevent it from occurring in the future. Verification of corrective actions is conducted by an independent verifier, which may be a member of the Division Assurance organization, the Environmental Programs Representative or the EMS Core Team.

16.3 Causal Analysis

Sandia follows a graded approach to determine the need for causal analysis to address issues identified during assessments, audits, inspections, etc. Issues could include findings, observations, management concerns, and potential nonconformities. This graded approach is described in Corporate Procedure: CG100.6.6 *Determine and Take Action* (SNL 2012d).

16.4 Validating Effectiveness of Actions

SNL/CA's process for validating the effectiveness of corrective and preventive actions for environmental and EMS-related issues is documented in Administrative Procedure AP800010, *Validation of Environmental or EMS-Related Corrective / Preventive Actions* (SNL/CA 2011b). The manager of the OHSEM Department and environmental subject matter experts determine which actions require validation. Actions are selected for validation based on the significance or risk of nonconformity. For example, actions that address serious nonconformities with potential

for a fine, significant negative environmental impact, or actions attempting to correct recurring issues, may be selected for effectiveness validation. The validation of an action is documented on an SNL/CA EMS Corrective / Preventive Action Validation Form. Completed forms serve as the ES&H record of validation.

There were no corrective or preventive actions that required validation in 2012.

17 Management Review

Annually, the EMS Management Representative reviews SNL/CA's EMS Program with SSHEAC (Section 3.1). Management reviews are intended to ensure continued suitability, adequacy, and effectiveness of the EMS Program. Reviews include the following topics.

- Results of internal audits and evaluations of compliance with legal and other requirements
- Communications from external parties
- Site environmental performance
- Progress in meeting EMS objectives and targets
- Status of corrective and preventive actions
- Follow-up actions from previous management reviews
- Changing circumstances including developments in legal and other requirements related to environmental aspects
- Recommendations for improvements
- Modifications and additions to environmental objectives and targets

In the past year, management reviews were completed in April and December 2012.

The April management review (conducted April 19, 2012), included a follow-up from the prior review, changes in requirements, results of audits and evaluations, compliance with requirements, status of corrective and preventive actions, and recommendations for improvement. No specific actions were identified for implementation as a result of this review.

During the December management review (conducted December 13, 2012) the EMS presentation included a follow-up from the prior review, recent major events, environmental performance for past year, extent to which objectives and targets were met, new and modified objectives and targets, recent audit results, and recommendations for improvement. The 2013 objectives were approved by SSHEAC during this review.

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18 EMS Documentation

Documentation to support SNL/CA'S EMS Program is comprised of both EMS-specific and general corporate and site documents and information sources. The SNL/CA EMS Program Manual is the primary EMS document for the site. It describes all elements of the EMS Program, how these elements connect, and it provides reference to other general documents that support the program. The EMS Program Manual documents the process used to identify significant environmental aspects applicable to site operations, and to establish objectives and targets that are measurable and relevant. It serves as a roadmap for continual EMS implementation, assessment, and improvement. The SNL/CA EMS Program Manual is reviewed and updated annually. Other documentation established for the SNL/CA EMS Program includes an ES&H policy/standard of performance (Chapter 2) and annual environmental program reports (maintained on the SNL/CA Environmental Management website). EMS documents also include procedures developed specifically for the EMS Program, EMS decision documents, EMS audit results, communications with external parties, and results of management reviews. All documents created under the EMS Program are records in accordance with the definition of a record used at Sandia.

Other SNL/CA site-specific and corporate policies, document systems, and databases also support the EMS Program. Figure 14 identifies the documents and document systems that support the SNL/CA EMS Program.

Figure 14 EMS Documentation

19 Records

Sandia manages all information created by Sandia work in accordance with the Corporate Policy System requirements identified in IM 100, *Information Management and Cyber Security* (SNL 2013c). As defined in the information management procedures, information encompasses data, records, published material, and knowledge in written, pictorial, electronic, audio, oral, or other form. To assist the workforce with the requirements for managing information, Sandia developed a Records Management Manual. The Records Management Manual provides guidance on identifying records and non-records, provides a list of federal and DOE requirements governing records management, and summarizes the records retention and disposition schedule. The complete manual is available on the Sandia intranet at http://info. sandia.gov/recordsmgmt/rmm/rmmframe.html.

SNL/CA maintains an additional procedure for managing ES&H records, OP471347 *Administrative Procedures for Managing Sandia/CA ES&H Recorded Information* (SNL/CA 2011a). This procedure incorporates corporate policies, requirements of the Records Management Manual, best business practices, program-specific regulatory requirements, and the requirements of the ISO 14001 standard. Under this procedure, ES&H programs are responsible for transmitting recorded information to the SNL/CA ES&H Record Center for storage and protection. The Record Center establishes file guides for categories of records and assigns a file code number. The file guide describes the record, identifies the retention period, describes the disposition instructions (where applicable), and provides filing instructions. Record Center personnel log all transmitted records into an electronic database. Document titles, dates, authors, and key words are included in the database to assist with tracking and retrieval of records.

SNL/CA established a file guide and code for EMS records in March 2005. The file code is AD-MAN-07.05. EMS program documents and supporting information are filed under this code with a permanent retention. SNL/CA maintains separate file guides and codes for other functional environmental program records that also support the EMS Program.

SNL/CA also uses a corporate database, EiMS / FileNet Workplace, to maintain electronic environmental program records. Environmental subject matter experts have the option of submitting records to the electronic system instead of creating paper copies. Electronic records support reductions in paper use and resources needed to manage and maintain paper records. The electronic system has been established and is managed as a permanent record.

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20 Communications

Sandia maintains an active communication system with established tools and processes to share information both internally and externally. As a result, SNL/CA personnel have many options available to communicate EMS information to the site workforce and to external stakeholders. Table 12 provides a list of communication methods used for the site's EMS.

Table 12 SNL/CA EMS Communication Methods

Action	Communicator	Audience	Method	Schedule
Interdisciplinary Team (IDT) Project Reviews	Subject Matter Experts/Members of IDT	Presenters of Proposed Projects	Meeting, Minutes, SME written responses	Weekly
Annual Site Environmental Report	EMS Core Team	External Community	Publication	July
Earth Day Activities	EMS Core Team	Members of Workforce	Web	April
Target Organizational Presentations	EMS Core Team	Select Line Organizations	Presentation	Various
Senior Management Annual Presentation	EMS Management Representative	Senior Site Management	Presentation	April / October
External 8000 Web Page	EMS Core Team	External Community and Potential Hires	Web	Continuous
SNL/CA ES&H Web Site	EMS Core Team	Members of Workforce	Web	Continuous
New Hire Orientation Briefings	EMS Core Team	New Members of Workforce	Presentation	Routine
Contractor ES&H Briefing	various	Site Contractors	Video	Routine
EP Rep Line Visits and Audits	EP Rep	Line Organizations	One-on-one	Routine
TNT	EMS Core Team	Members of Workforce	Publication	Varies
ENV 233	EMS Core Team	Waste Generators	Classroom Training	Annual
Banners / Posters / Handouts	EMS Core Team	Members of Workforce	Misc. Distribution	Routine
Recruiting	Recruiters	Potential New Hires	Brochures	Varies

20.1 Internal Communications

The SNL/CA EMS Core Team communicates EMS information to the site workforce through the IDT process, publications, internal web sites, briefings, assessments, and promotional materials. The EMS Core Team receives input on environmental issues, including aspects and

impacts, through the IDT process, the NEPA process, an ES&H telephone hotline, the self-assessment process, and the ES&H internal web site contacts list.

20.2 External Communications

SNL/CA's decision to communicate externally about the EMS program, including significant environmental aspects, is documented in a Memo-To-File (Figure 19). SNL/CA accomplishes external EMS communications through the annual site environmental report and Sandia's external web site at http://public.ca.sandia.gov/about/community/environmental_mgt.php. Figure 19 provides a list of EMS topics included in the annual report. A comment response card is distributed with the annual report and a link is provided on the web site to gather input from external stakeholders. All published information distributed externally must be reviewed and approved for public release in accordance with Sandia requirements.

The EMS Core Team routinely communicates with external parties about elements of the SNL/CA EMS. External communications follow the Administrative Procedure (AP800007), *Department 8516, OHSEM Communications* (SNL/CA 2013a). Environmental staff members also conduct community outreach efforts by participating in site events, such as family days and site celebrations, and through presentations at conferences. In 2012, the Environmental Monitoring and Ecology SME participated in a series of working groups with other DOE laboratories on storm water and waste water efforts and requirements.

Regulating authorities also conduct scheduled and unannounced site audits. These audits provide an additional avenue for communicating with our stakeholders and keeping them abreast of our EMS Program.

Sandia National Laboratories

Operated for the U.S. Department of Energy by
Sandia Corporation
Livermore, California 94551-0969

date: July 18, 2006

to: Memo-to-File

from: Gary Shamber
SNL/CA EMS Management Representative

subject: External Communications of the SNL/CA EMS

This Memo-to-File documents SNL/CA's decision to communicate externally on the various elements of its EMS Program. External communications shall be accomplished through an annual environmental report as required by *DOE Order 231.1A, Environment, Safety, and Health Reporting*. The annual report shall provide information of significant site EMS elements including:

- The site's environmental policy
- Significant environmental aspects and impacts
- Legal and other requirements
- Environmental objectives, targets and programs
- Pollution Prevention and waste minimization
- Resources, roles, responsibilities and authorities
- EMS competence, training and awareness
- Communication and community involvement
- Environmental documentation
- Control of documents
- Operational control
- Emergency preparedness and response
- Monitoring and measurement
- Evaluation of compliance
- Nonconformity and corrective and preventive actions
- Control of records
- Internal audits
- Management Review

SNL/CA's annual report shall include other content items as required by the annual content guidance issued annually by DOE.

The report shall be made available to the external community on Sandia's external website and by direct distribution to interested parties upon request.

Exceptional Service in the National Interest

Figure 15 External Communication Decision Memo

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