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Mr. Rex Beach
Associate Director for Safety and
Environmental Protection (Acting)
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Subject: NNSA/LSO Approval of ISM System Description, Version 7.0

Dear Mr. Beach:

The NNSA Livermore Site Office (LSO) has completed its review of the annual update of the LLNL Integrated Safety Management (ISM) System Description, Version 7.0. The System Description, Version 7.0 meets the NNSA requirements and I am approving the ISM documentation.

If you have any questions, please contact Ralph Kopenhaver at (925) 422-3126.

Sincerely,

Camille Yuan-Soo Hoo
Manager
Livermore Site Office

cc: M. Anastasio, L-005
G. Mara, L-005
R. Failor, L-382

**LAWRENCE LIVERMORE
NATIONAL LABORATORY**



**July 20, 2004
UCRL-AR-132791
Version 7.0**



**Lawrence Livermore National Laboratory
Integrated Safety Management System Description
Version 7.0**



Integrated Safety Management provides important opportunities and advantages for the Lawrence Livermore National Laboratory and the Department of Energy in the consistent and proper attention to safety essential in the conduct of the Laboratory's missions. This document describes a forward-looking and comprehensive institutional approach and set of requirements for operations and activities and for the implementation of the Integrated Safety Management System. A high level of attention to safety and performance is of prime importance to the success of the Laboratory and the Department of Energy.

Approval:



Michael R. Anastasio, Director
Lawrence Livermore National Laboratory



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Integrated Safety Management System Description
Version 7.0**



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NOTICE

This LLNL Integrated Safety Management System (ISMS) Description is available on the LLNL website at the following address:

http://www.llnl.gov/es_and_h/ism/ism-description.pdf

Executive Summary

Introduction

The Lawrence Livermore National Laboratory (LLNL) is taking a comprehensive institutional approach to its Integrated Safety Management System (ISMS). This Description articulates the institutional requirements for all operations (at the main site, at nearby Site 300, or at any other sites where Laboratory employees and subcontractors work).

This Description contains the requirements for LLNL's *ES&H Manual* and Directorate Implementation Plans. Much of this Description explains safety management system mechanisms plus a work planning and authorization process. It addresses the Work Smart Standards (WSS) set and their incorporation into Laboratory operations. In particular, it includes restatements, clarifications, and new statements of institutional requirements for LLNL operations.

This Description is intended for use by LLNL's workforce and is available for those in the University of California (UC) and Department of Energy (DOE) organizations who review operations, verify compliance, and approve modifications.

Background

The Lawrence Livermore National Laboratory is a government-owned, contractor-operated, multi-program research and development facility. UC manages and operates LLNL under Prime Contract W-7405-ENG-48 for DOE. "Contract 48" defines the principles, working relationships, and contractual and legal requirements under which the Laboratory must operate.

The institutional ISMS requirements result from LLNL's careful examination of its approach to safety. They follow the guidance from DOE Headquarters and the National Nuclear Security Administration (NNSA)/Livermore Site Office (LSO). (Note: NNSA/OAK became NNSA/LSO in December 2002.) They are consistent with Contract 48's requirements and adhere to the ISMS structure described by DOE. The requirements have been refined through an interactive process involving the Laboratory Director, Deputy Directors, and all Associate Directors (including selected members of their management, supervisory, and operational staffs).

Goal and Commitment

LLNL's safety goal is to continuously strive for a healthy, accident free, and environmentally sound workplace and community while providing the scientific and technical excellence needed to meet critical national missions. The Laboratory is committed to doing this while meeting the requirements of Clause 6.7 of Contract 48

and implementing the policy provided in DOE Policy 450.4 (“Safety Management System Policy”).

The Laboratory affirms that it:

- 1) Understands and supports the Contract 48 requirement for an ISMS at LLNL and the opportunities and values of it.
- 2) Adopts DOE’s ISM Objective, Guiding Principles, and Core Functions and the institutional requirements in this LLNL ISMS Description document.
- 3) Commits to implementing and using ISMS in all its programs, operations, facilities, and activities.

Environment, Safety, and Health (ES&H)

“Safety” throughout this document is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment (as defined in DOE Policy 450.4). Clause 6.7 of Contract 48 expands the definition of safety by “including pollution prevention and waste minimization.”

The Laboratory regards protection of the environment and promotion of employee good health as essential components in its overall safety management system. Critical to the interface with environmental and health systems is the responsibility of the programs to appropriately consider and include these parts of “safety” in all their operations, facilities, and activities.

Safety Management Fundamentals

This Description identifies the core requirements that provide the foundation for safety management at LLNL. These requirements implement DOE’s seven Guiding Principles and five Core Functions along with LLNL’s Fundamental Guiding Principle (see below):

DOE Seven Guiding Principles

- 1) Line Management Responsibility for Safety.
- 2) Clear Roles and Responsibilities.
- 3) Competence Commensurate with Responsibilities.
- 4) Balanced Priorities.
- 5) Identification of Safety Standards and Requirements.
- 6) Hazard Controls Tailored to Work Being Performed.
- 7) Operations Authorization.

DOE Five Core Functions

- 1) Define the Scope of Work.
- 2) Analyze the Hazards.
- 3) Develop and Implement Hazard Controls.
- 4) Perform Work within Controls.
- 5) Provide Feedback and Continuous Improvement.

LLNL Fundamental Guiding Principle

Each worker, supervisor, and manager is directly responsible for ensuring his or her own safety and promoting a safe, healthful, and environmentally sound workplace and community.

The above fundamental requirements provide the necessary specificity and detail for ISM implementation through LLNL documentation. The *ES&H Manual* is the principle institutional mechanism for implementation.

Core Requirements

The comprehensive set of core requirements developed and presented in this Description has the following principal elements:

Accountability. Apropos to the LLNL Fundamental Guiding Principle, all workforce members are held accountable for meeting the Laboratory's ES&H requirements. Accountability is established and enforced through the following primary means:

- 1) Communicate ES&H expectations to employees.
- 2) Reinforce expectations through timely verbal feedback.
- 3) Annually implement formal appraisal and salary actions for each employee.
- 4) Awards and recognition for notable contributions to ES&H.
- 5) Corrective action in cases of employee misconduct.

Safety Responsibility. Management is responsible for the Institutional ISMS. Ultimately, each worker, supervisor, and manager is responsible for safety at the Laboratory as stated in LLNL's Fundamental Guiding Principle.

Management Chain. Organizations that authorize work (Authorizing Organizations) identify a management chain for each work activity. Such organizations identify the individuals serving in the chain [i.e., first-level supervisor (Responsible Individual) up to responsible Associate Director (AD)]. The chain has clear roles, responsibilities, and authorities for managers, supervisors, and workers. It has direct control over the

funding of the work activity. It exists for all LLNL operations down a clear line of funding and ES&H responsibility. The chain has full responsibility for implementing DOE's seven Guiding Principles and five Core Functions. Ultimately, it ensures that individuals perform work safely.

Subcontractors. LLNL's commitment to safety and ISM is formally extended to subcontractors and subcontract employees for whom LLNL has safety responsibility. Safety requirements are to be incorporated into all subcontracts and flowed down to lower tier subcontractors, as appropriate.

Graded Approach and Tailoring. ISMS at LLNL provides for a graded approach (i.e., different levels of rigor and formality) when applying controls commensurate with the hazards involved. To complement this, tailored controls address the hazards, satisfy the applicable requirements, and provide adequate protection to the public, workers, and the environment.

Work Planning and Authorization. Work is planned, reviewed, and authorized before the activity begins. An appropriate prestart review is conducted to validate satisfaction of the safety requirements. Once the work begins, it is appropriately controlled (workers are responsible for adhering to the safety controls; Responsible Individuals ensure the work is performed according to the defined work controls). Responsible Individuals make sure workers have access to and knowledge about an activity's governing procedures and work controls.

Feedback and Improvement. Work activities are monitored to be sure the governing procedures and safety documents are being followed. Workers are to tell Responsible Individuals of safety problems or opportunities for improvement. A worker can stop work if there is an unsafe or unapproved condition. Each directorate develops and operates a safety self-assessment program to guarantee a proactive approach to safety and to improve safety performance. Also, directorates are responsible for root-cause analysis and correction of safety-related problems. Lessons Learned are to be shared to enhance operational safety and facilitate cost effectiveness.

Integration

Integration of program and safety planning from the Director down to individual workers is attentive to the Institution/Facility/Activity Process. Basic to Laboratory integration and operations is the *ES&H Manual* and incorporation of its ISMS fundamentals. Worker involvement is critical to ISM. Thus, an important integration direction is a formalized upward involvement of workers as well as top down through the Institution/Facility/Activity Process. In this context, all work activities are to be performed according to the provisions of the *ES&H Manual* with the assistance of ES&H Subject Matter Experts and ES&H Teams. Horizontal integration across the directorates is accomplished through many established groups.

Directorate Implementation Plans. To demonstrate flow down to the working level, each directorate has an Implementation Plan. Separate plans are needed because of each directorate's unique programmatic mission coupled with different types of facilities, technical work, and hazards. These plans reference specific implementing provisions for each ISMS requirement. Following implementation at the directorate level, directorates may transition the Implementation Plan to other established directorate plans or documents (e.g., ES&H Management Plans, ISM Management Plans, and QA Plans) that satisfy the requirements specified in this Description.

ES&H Manual. To be in line with the increased formalization brought about by ISM, the Laboratory has assembled broadly used institutional ES&H documents into a formal document structure called the *ES&H Manual*. This comprehensive Manual consolidates many documents into one convenient, online package. LLNL performs work to meet the requirements of the Manual. Its requirements are based on the WSS set identified for specific Laboratory work and associated hazards. With the implementation of ISM, employees must understand the latest ES&H requirements and their responsibilities.

Communications and Training. The transition to an effective ISMS requires a comprehensive communications program that includes training all workers. Laboratory-wide communications and tailored training to support the ISM rollout started in 1999 and continues. Communications goals include creating ISM awareness and sensitizing employees to environment, safety, and health issues. The intent is for ES&H issues to be a routine part of all Laboratory communications.

Standards and Requirements

Contract 48 stands as the fundamental basis for Laboratory operations. It provides the legal foundation for all activities. Clause 6.7 of Contract 48 is the foundation of ISM and is consistent with DOE Policy 450.4.

Work Smart Standards. Clause 5.5 of Contract 48 contains the language providing for WSS. These standards establish workplace safety controls and are an integral part of ISM. DOE, UC, and LLNL collaborated in a Necessary & Sufficient (N&S) Process to tailor a WSS set for LLNL. This WSS set replaced existing contractual ES&H requirements. An outside independent team of ES&H experts confirmed the standards to be appropriate and feasible for LLNL in March 1999. On August 5, 1999, the NNSA/OAK Manager and LLNL Director gave signature approval for the WSS set, which was incorporated into Contract 48.

Maintenance of WSS Set. The standards can be modified to meet the Laboratory's changing needs. A formal Change Control Process, using the N&S Process, will provide an opportunity to keep the WSS set up-to-date.

Flow Down of Requirements. LLNL operations are addressed through safety management processes and controls noted in the *ES&H Manual*. This and other institution-level documents include formal processes for applying requirements locally at the facility and activity levels. A key to the flow-down process is the formal incorporation of the WSS set into the *ES&H Manual*.

Change Control Process

A formal Change Control Board (CCB) reviews requests for changes to this Description. There are three members of the CCB, representing NNSA/LSO, UC, and LLNL. They are appointed by their respective organizations. The CCB Chair is the NNSA/LSO representative.

Schedule

On March 3, 1999, Secretary of Energy Richardson directed all department and contractor employees to “put ISM in place by September 2000.” LLNL previously met its first major milestones when it delivered the first versions of the Superblock Description to NNSA/OAK in October 1998 and this LLNL Institutional Description in December 1998. In parallel, the LLNL WSS set was completed and confirmed in March 1999. It was signed and incorporated into Contract 48 on August 5, 1999. Further accomplishments were made with the successful Superblock ISMS Phase I and II Verification completed in September 1999. The NNSA/OAK approved the description on September 30, 1999, contingent on addressing two items, which have been completed. The second version of this institutional ISMS Description addressing NNSA/OAK comments and including LLNL items to make it more complete and understandable was completed in October 1999. The verification of the LLNL Institutional ISMS was successfully completed in September 2000. The Superblock ISMS Description (Ref.1) and the LLNL site-wide ISMS Descriptions are reconciled. The essential sections of the Superblock ISMS Description have been incorporated as an appendix to the site-wide description.

1.0 Background

The Lawrence Livermore National Laboratory (LLNL) is a government-owned, contractor-operated research and development facility managed and operated by the University of California (UC) for the Department of Energy (DOE) under Prime Contract W-7405-ENG-48 (Contract 48) (Ref. 2). Contract 48 defines the principles, working relationships, contractual requirements, and legal requirements under which the Laboratory must operate and is held accountable.

LLNL is a multi-mission national laboratory operated by DOE and committed to critical missions of national importance. The LLNL FY04 budget is \$1.6 billion. The current Laboratory workforce consists of approximately 7000 indefinite career employees with approximately 2000 temporary employees, post-doctoral researchers, supplemental labor, and participating guests. In addition to the Laboratory workforce population, there may also be as many as 1000 contractors and visitors on-site per day. There are approximately 140 federal employees at the NNSA/LSO, who operate under their own ISMS structure and documentation.

The main site of 1.2 square miles is adjacent to Livermore, California and a remote site of 11 square miles, designated Site 300, is 15 miles east near Tracy, California. There are approximately 470 buildings at the main site. Some were at the site when LLNL started in 1952 and there is major ongoing construction with the National Ignition Facility (NIF), a very large and important new capability. The main site has facilities that range from regular offices and a visitor center to the Plutonium Facility in the Superblock located interior to the main site. Site 300 is used primarily for high explosives activities. This Description applies to activities at the main site and Site 300, and to LLNL activities at other sites as described in Section 3.

LLNL operates successfully under a mixed matrix organizational structure of program, payroll, facility, and services directorates. In this Description, the term “directorates” includes equivalent organizations at LLNL. They range in workforce size from approximately 120 to 2400 individuals. In reality, most all of the directorates have program, payroll, facility, and services operational functions, some with more of one than the other, and consequently have to be attentive to all aspects and the particular responsibilities of each. This comes about through the types of funding and the attendant responsibilities. Similarly, the term “Associate Directors” includes equivalents in this Description.

The creation and development of Integrated Safety Management (ISM) in NNSA operations has evolved over time. The Price-Anderson Amendments Act (PAAA) in 1988 is seen as a start in ISM along with the fundamental changes brought about with the end of the Cold War. Actions by the Defense Nuclear Facilities Safety Board (DNFSB) in their Recommendations 90-2 and 92-5, site visits by the Tiger Teams, and

DOE Nuclear Safety Order upgrades led to increased attention and formalization in the DOE operations. The DOE initiation of the Necessary and Sufficient Standards in 1995, which became the Work Smart Standards (WSS), continued that process. DNFSB Recommendation 95-2 combined several prior DNFSB Recommendations and considerations in reports and became the primary driver for ISM, which is contained in the DOE Implementation Plan for DNFSB Recommendation 95-2. The DOE Safety Management System Policy, DOE P 450.4 (Ref. 3), of October 15, 1996, presented the structure to “provide a formal, organized process whereby people plan, perform, assess, and improve the safe conduct of work.” It was “institutionalized through DOE directives and contracts to establish the Department-wide safety management objective, guiding principles, and functions.” The applicable Department of Energy Acquisition Regulation (DEAR) amendment followed in 1997 and Clause 6.7, “Integration of Environment, Safety, and Health into Planning and Execution,” became part of the UC DOE contract for LLNL on October 1, 1997. Secretary Richardson’s Memorandum of March 3, 1999, on “Safety-Accountability and Performance,” (Ref. 4) and the revised Integrated Safety Management System Guide, DOE G 450.4-1A (Ref. 5), of May 27, 1999, are major examples of direction and guidance as ISM continues to be developed and refined.

This Description articulates the institutional requirements for all LLNL operations and provides definition and elaboration of the critical aspects for the understanding and successful implementation of the ISMS.

2.0 Purpose

This LLNL Integrated Safety Management System (ISMS) Description provides a formally approved institutional structure for ISM developed by LLNL, using written guidance and continued detailed interaction and coordination from NNSA/LSO and DOE/HQ. It contains the LLNL institutional approach for the incorporation and implementation of the DOE Safety Management System Policy, DOE P 450.4, which is to "...systematically integrate safety into management and work practices at all levels so that missions are accomplished while protecting the public, the worker, and the environment." Upon final approval by NNSA/LSO, it establishes the agreement on the content and processes for ISM implementation and continued utilization at LLNL.

This document contains the institutional requirements to be used for all activities at LLNL and in the development of the individual directorate Implementation Plans necessary for the incorporation of the full ISMS at LLNL. It includes the major action criteria, methods, and milestones planned for the institutional implementation as well as the expectations of the directorate Implementation Plans. Included are the considerations for the WSS set that were approved and incorporated into Contract 48. The development, LLNL approval, and delivery of this LLNL ISMS Description on December 29, 1998 through this updated version, satisfies a key requirement of Clause 6.7 of Contract 48 effective October 1997 (see Section 16).

This Description includes restatements, clarifications, and new statements of the institutional requirements for all LLNL operations. These have been refined through an interactive process involving all of the ADs and their staffs and operational personnel, the Deputy Directors, and the Director. The institutional requirements presented are a result of a complete reappraisal within LLNL of the safety approach using the requirements contained in Contract 48, the ISMS structure, and the current DOE environment. "Safety" throughout this document is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment as defined in DOE P 450.4. Contract 48, Clause 6.7 expands the definition of safety by "including pollution prevention and waste minimization."

The similarities of missions, facilities, and activities at LLNL with the Los Alamos National Laboratory makes it useful and valuable in having basic consistencies in the respective ISMS Descriptions; both use a WSS set in the DOE unifying ISMS structure. With the UC and NNSA/OAK connections, the Lawrence Berkeley National Laboratory ISMS has also been used in the preparation. Additionally, considerations and applicable items from other DOE contractors have been incorporated in order to provide as complete a description as is currently possible.

Intended users of this Description are all those in the LLNL workforce. Similarly, it is available to those in UC and DOE organizations with ISM, ES&H, oversight, and contract responsibilities.

3.0 Scope

This LLNL ISMS Description presents the institutional requirements and major methods for the implementation of ISMS into all of the operations and activities at LLNL. It is based on the provisions of Contract 48 with the WSS set. This Description was prepared using the NNSA/LSO guidance letter of August 18, 1998 (Ref. 6) and DOE G 450.4-1, dated November 26, 1997 (Ref. 7). Due consideration and use of these guidance documents and other relevant documentation was made throughout the preparation.

LLNL accomplishes its institutional role in the DOE ISM Institution/Facility/Activity Process by a combination of Laboratory-wide or infrastructure functions and all of the directorate or operating unit functions. The Laboratory-wide functions are those that affect all LLNL operations and employees. The directorates contain the programs with the funding, have the people, operate the facilities, and conduct the activities. The word “institution” is used instead of “site” or “site-wide” because there are many LLNL activities elsewhere and they all need to be covered.

This Description provides the structure that shows the hierarchy of documentation, organization, and commitment for the implementation and continuance of the LLNL ISMS. It starts with this Description followed by implementing plans for each directorate. Implementation Plans all use the *ES&H Manual* and directorate-specific documentation to address their particular operations, activities, and hazards. Key features in ISM are the conscious consideration and application of the graded approach and the concept of “tailoring commensurate with the hazards.” These are critical in having a practical and affordable implementation and utilization. Worker involvement is also important and is actively sought out throughout the work review, authorization, and execution process. The LLNL ISMS provides a formal process that replaces a variety of other formal, semiformal, and informal processes that have become part of the system over the history of the Laboratory.

The description applies to the work authorized under Contract 48, which, in addition to Research & Development, includes administrative and operational support functions such as business operations, facility construction and maintenance, and security and emergency response activities. The Laboratory and DOE may mutually agree to authorization agreements for certain facilities or activities. All facilities and activities at LLNL not specifically operating under an authorization agreement, or a separately approved ISMS Description, are authorized when following the processes described in this ISMS Description.

At LLNL, facilities are defined as individual buildings or groups of buildings with a common purpose like the Engineering Test Facilities at Site 300. The operational structure for the facilities is clearly centered on the Facility Point of Contact (FPOC)

who is appointed for each facility by the responsible AD and is readily identifiable and available. For the areas between buildings, the responsible organization is the Laboratory Services Directorate (LSD). In situations where programmatic activities are outdoors, the cognizant program directorate has the responsibility for the local area involved.

Many LLNL personnel are assigned to or interact with a wide variety of outside organizations including other DOE sites, in the DoD, other governmental agencies, and overseas in various action and inspection capacities. This results in heavy travel traffic, with its own safety hazards, during the course of Laboratory business. The LLNL personnel in these situations have had training in the LLNL ISMS, both institutional and from their directorates, and are expected to appropriately use the process in the conduct of their official activities and assignments. For those at other DOE sites (HQ, Y-12, Pantex...), either as visitors or on assignment, they are expected to work according to the ISMS and any accompanying agreement structures with the organizations operating at those sites. The directorate implementing plans and any succeeding documentation provide the specifics for their offsite personnel and connections.

For the extensive, on-going LLNL activities in the operations of the Nevada Site Office of NNSA (NNSA/NSO), mainly at the Nevada Test Site (NTS), there are additional requirements and responsibilities. NTS is operated by NNSA/NSO as a national user facility for the conduct of potential underground nuclear tests, subcritical experiments, and other scientific activities that require isolation from the general public to ensure safety and security. LLNL is an important contributor to the on-going definition and execution of the NNSA/NSO missions through its experimental programs and projects conducted there. NNSA/NSO functions as the operations integrator for the activities of its contractors, the Laboratories (LLNL, LANL, and SNL), their respective NNSA site offices, including NNSA/LSO. NNSA/NSO is responsible for the stewardship of NTS and its other sites, providing infrastructure, security, services, and technical support to the Laboratories and other programs through its contractors, the principal of which is the management and operations (M&O) contractor, Bechtel Nevada (BN). NNSA/NSO also funds the Laboratories to assist in the conduct of its operations, providing for the maintenance of unique Laboratory skills necessary for the NNSA/NSO missions and to assure LLNL compliance with NNSA/NSO requirements. Operating with the other Laboratories and contractors produces additional relationships and connections requiring interaction and coordination. For the execution of its missions and the programmatic activities in its operations, NNSA/NSO has an existing structure of agreements, policies, and requirements.

NNSA/NSO has implemented the requirements of DOE P 450.4. Under this implementation, each user organization (LLNL, LANL, SNL, and DTRA) is responsible for maintaining an approved ISM program. NNSA/NSO contractors (Bechtel Nevada, Wackenhut Services, and IT) also maintain independent approved ISMS and ISMSD. All

LLNL work in Nevada conforms to the requirements of this institutional ISMSD. NNSA/NSO may impose additional requirements.

The Tri-Lab WSS governing LLNL activities apply to efforts in Nevada. Appendix G of Contract 48 provides WSS applicable to work and hazards common to both the Livermore site and NTS. Standards for unique LLNL work in Nevada are evaluated with the necessary and sufficient process for incorporation in the proper context into the WSS set in Contract 48, Appendix G. These address the unique hazards in the facilities and activities in NNSA/NSO operations and accommodate those activities NNSA/NSO specifies as common activities for all of its contractors and users at its sites. The specified common activities result from cost considerations, operational efficiencies, and timeliness of action and reporting.

To assist in the implementation of the NNSA/NSO standards and directives, Volume VI, “Nevada Requirements,” is included in the *ES&H Manual*. Similarly, directorate and programmatic documentation is being developed and implemented. This documentation includes additions to the directorate Implementation Plans and the necessary structure of program management and implementation plans addressing the facility and activity specifics. Throughout all, an important part of the LLNL responsibilities is the support of the overall NNSA/NSO ISM process.

The reconciliation of the initial Superblock ISMS Description (Ref. 8) with the Institutional ISMS Description required a number of aspects to be addressed. The initial Superblock Description was completed and submitted to NNSA/LSO in October 1998. The initial version of this Institutional ISMS Description was completed on December 29, 1998, and was different in a number of important ways. It contained new definitions and operational methodologies that have resulted from the Laboratory-wide efforts to align with the DOE Integrated Safety Management Policy and the accompanying guidance and other related documentation. Considerations for the WSS set were included. The initial Superblock ISMS Description was prepared using the requirements in Appendix G of Contract 48 as of October 1998 and in accordance with the Authorization Agreement for the Plutonium Facility of June 1997. The particular hazards involved require a high level of formality and specificity that are not required for most of the other operations at LLNL. This Institutional Description encompasses and provides for the Superblock activities by establishing the institutional requirements and major implementation considerations using increasing formality, analysis, and documentation commensurate with the hazards. The current Authorization Agreement for Building 332 was made effective February 5, 2003 (Ref. 9).

A revised Superblock ISMS Description (Ref. 10) was completed in May 1999, using the guidance and documentation that was in effect on May 1, 1999. The Superblock ISMS Phase I and II Verification was conducted in September 1999 and NNSA/OAK approval of the Superblock ISMS Description was made on September 30, 1999 (Ref. 11) contingent on addressing two items. Revision 2 of the Superblock ISMS Description

(Ref. 12) was completed in October 1999 using guidance and documentation in effect on October 1, 1999 including Version 2.0 of this institutional ISMS Description and formal comments from NNSA/LSO through the year and from the September Verification. The contingent items were addressed on schedule.

In late 1997, the Plutonium Facility was placed in STANDBY mode at the direction of the Associate Director for Defense and Nuclear Technologies (DNT) with concurrence of DOE/OAK due to safety concerns in the facility. During the investigation of these concerns, it became apparent that there were several inadequacies in the work control processes used, including criticality safety controls. The facility then undertook a phased restart process to return the facility to an operational mode. The B332 Activity Resumption Plan (ARP), dated February 26, 1998, was approved by the AD for DNT with concurrence by the DOE.

As part of the ARP, the Plutonium Facility developed a comprehensive work control process, including new criticality safety controls. The AD for DNT commissioned a Resumption Review Panel to evaluate B332 compliance to the ARP. Upon completion of resumption activities, the AD for DNT approved the AD/DNT Review Plan of the B332 resumption process in January 1999 to assess the readiness of B332 to resume normal operations. The review plan assessment team included DOE membership and recommended to the AD for DNT to restart B332 in March 1999. The AD for DNT directed B332 to resume normal operations with the concurrence of the DOE. LLNL and the DOE approved the work control process as part of the restart authorization. This process flowed into the development of the ISMS System Description for the Superblock Facilities, a more stringent work control process than subsequently adopted for the rest of LLNL. The Authorization Agreement for B332 incorporates the Facility Work Control Process as a requirement for operation and assurance of acceptable risk.

The actual work control process is applied to the Category 3 facilities in Superblock, including the Radiography Facility (B-239), in a graded approach, as the stringency of the B332 would not be required for the other facilities. There is currently no requirement for Authorization Agreements for the Category 3 Nuclear Facilities in the Superblock.

Essential portions of the Superblock Description (i.e., the Superblock work control process) were incorporated into Version 6.0 of this site-wide System Description. As such, the need to maintain a separate Superblock System Description no longer exists; therefore, it has been cancelled.

To facilitate stability and use of this Description, Section 16, "Appendices," is placed outside of the Section 13 Change Control Process. The Appendices contain the two Contract 48 clauses that provide the requirements for ISM and WSS and are the responsibility of those who negotiate and control Contract 48. Also included in the

Appendices are the essential elements of the Superblock Work Control/Design Change Process.

The Laboratory will periodically review this Description and make feedback and improvement changes. The initial review will occur at or about the anniversary date of its NNSA/OAK approval. This provides a process to evaluate what is working and what needs improvement and to address any new initiatives and proposals. It permits a comprehensive maintenance of the description and the opportunity to keep it current. This review goes beyond the action-oriented type of changes that are most likely in the ongoing Change Control Process. The changes that result from this review will be submitted to the established Section 13 Change Control Process and addressed accordingly. The LLNL Document Manager is responsible for posting the currently approved ISMS System Description to the ES&H web site.

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4.0 System Overview

4.1 Introduction

The ISMS is the means by which ES&H requirements are integrated into the planning and execution of work. It consists of two related components: organizational structure (arrangements of people) and underlying principles and operations (functions or processes). DOE and its contractors must systematically integrate safety into management and work practices at all levels so that missions are accomplished through effective integration of safety management into all facets of work planning and execution. In summary, the overall management of safety functions and activities becomes an integral part of mission accomplishment.

DOE has defined seven Guiding Principles that are the fundamental policies for DOE and its contractors to use in the management of safety. They are by title:

- 1) Line Management Responsibility for Safety
- 2) Clear Roles and Responsibilities
- 3) Competence Commensurate with Responsibilities
- 4) Balanced Priorities
- 5) Identification of Safety Standards and Requirements
- 6) Hazard Controls Tailored to Work Being Performed
- 7) Operations Authorization

DOE has defined five Core Functions for integrated safety management that comprise the underlying process for any work activity that could potentially affect the public, the workers, and the environment.

- 1) Define the Scope of Work—Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.
- 2) Analyze the Hazards—Hazards associated with the work are identified, analyzed, and categorized.
- 3) Develop and Implement Hazard Controls—Applicable standards and requirements are identified and agreed-upon, controls to prevent and/or mitigate hazards are identified, the safety envelope is established, and controls are implemented.
- 4) Perform Work within Controls—Readiness is confirmed and work is performed safely.

- 5) Provide Feedback and Continuous Improvement—Feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented, line and independent oversight is conducted, and, if necessary, regulatory enforcement actions occur.

These five Core Functions are applied as a continuous cycle with the degree of rigor appropriate to address the type of work activity and the hazards involved. The ISM Work Cycle, as displayed in the figure below, shows the continuous relationship of the functions.

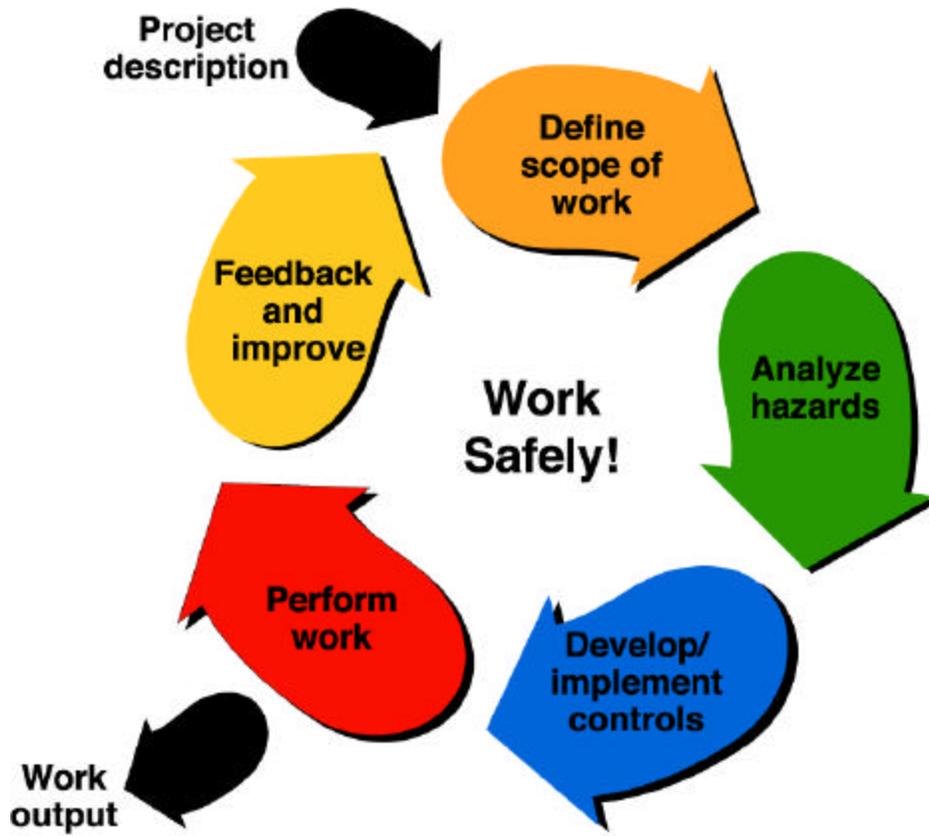


Figure 4.1 Basic ISM Work Cycle.

The Laboratory's ISMS functions are performed at the institutional level to clarify missions; to establish ES&H policies, objectives, and expectations; to select a tailored set of ES&H standards; to generate and authorize use of the *ES&H Manual*, other direction, and guidance; and to assess overall system performance. Much of the information produced at the institutional level is also used to safely accomplish programmatic and institutional work at the facility and activity levels.

At the facility level, ISM takes the form of ensuring the safe operation of the facility infrastructure and the activities within the facility. This means that the Guiding Principles and Core Functions of ISM are followed not only in operating the facility, but

in ensuring the activities performed in that facility are within the facility safety envelope and compatible with one another. For this reason, facility management concurrence is required before activities can commence within the facility.

Although the Laboratory's ISMS functions performed at the activity level involve many of the same positions and organizations as those at the institutional level, the information generated and shared is different. At the activity level, management is concerned about technical approaches; reaching specific work objectives; resources and schedules; hazards associated with the specific work; acceptable controls for protection; hardware, facilities, methods, and staff; and authorization to proceed.

Organizational structure, functions, and information sharing are all necessary for the successful management of ES&H integration.

In a large laboratory such as LLNL with its diverse activities, some ES&H management processes must be common while others are based on local practices and needs that vary among the different programs and organizations. An appropriate balance must be attained between specific processes chosen or designed for particular facilities and activities and those of the institution. Common Laboratory processes may give economies of scale, simplify training needs for similar activities carried out in different organizations and facilities, and reduce risks related to confusion that may result from staff movement from organization to organization that is a characteristic of the matrix approach to R&D management. Locally developed processes and controls provide the flexibility to meet local needs. These benefit from decision making at appropriate levels in the programs and organizations, and involvement of staff who are more knowledgeable of the work and its risks so that reasonable and effective decisions can be made. Throughout all activities and in the ISMS itself, appropriate and graded use of quality assurance principles and processes as described in the *ES&H Manual* provides continued attention to the work and opportunities for improved operations and performance.

To achieve the benefits of both locally developed processes and controls and institutional consistency, the Laboratory uses the Guiding Principles and Core Functions as direction in creating management expectations for facility and activity work planning and execution while retaining a required level of institutional uniformity: work-specific tailoring at the activity level, tailoring to meet facility-specific management processes and controls, and uniform expectations at the institutional level.

LLNL, UC, and NNSA/LSO develop objective measures against which the overall performance of the Laboratory's management system can be gauged. Mutually developed ES&H performance measures are important ISMS measures of effectiveness.

4.2 Goal

LLNL's safety goal is to continuously strive for a healthy, accident free, and environmentally sound workplace and community while providing the scientific and technical excellence needed to meet critical national missions.

In this goal, safety is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment as defined in DOE P 450.4. Contract 48, Clause 6.7 expands the definition of safety by "including pollution prevention and waste minimization."

4.3 Philosophy

LLNL's overall safety philosophy is as follows:

- 1) In the context of carrying out our technical missions, safety is our most important day-to-day consideration.
- 2) Accidents are preventable through close attention to potential hazards and appropriate action by each individual and the responsible organizations.
- 3) Managers and supervisors are responsible for ensuring that an adequate system is in place to carry out work safely. For each work activity an identifiable line management chain is ultimately responsible.
- 4) Each supervisor is expected to ensure that all individuals reporting to them understand the safety expectations, governing work controls, and the means by which they can safely and successfully perform their assignments.
- 5) Each individual is directly responsible for ensuring their own safety and promoting a safe, healthful, and environmentally sound workplace and community.

4.4 Policy

It is each individual's responsibility to understand the Laboratory's safety goal and to participate in its pursuit; to determine in concert with others the best way to achieve the safety goal in conformance with Laboratory requirements; to use appropriate resources at their disposal; and to ask for any help necessary to ensure a safe work environment while performing their broader set of job responsibilities and pursuing their technical, administrative, or craft objectives.

The role of managers and supervisors is to specify the technical, administrative, craft, and safety goals; assign specific responsibilities; appropriately define and manage ES&H issues; provide the necessary resources required to accomplish the objectives; assure compliance; monitor and evaluate performance; and reward each individual appropriately.

To achieve the safety goal, work at LLNL will be done using the *ES&H Manual* with the direct assistance and support of the Subject Matter Experts and the ES&H Teams.

Directorates must assure work is performed consistent with the requirements and expectations specified in the institutional ISMS Description. The authorizing organization (i.e., the program AD or the organization serving in that capacity) is responsible for authorizing specific work activities. Authorizing organizations are distinguished by having control of the funding. Organizations authorizing work and the associated management chain are responsible for ensuring that all work in their purview is conducted safely.

4.5 ISMS Implementation Process

Each directorate has plans or procedures to implement ISMS that demonstrate how the requirements specified in this Description are satisfied. For this Description, the term Directorate Implementation Plan is used to include any succeeding documentation. Directorate Implementation Plans reference specific implementing provisions for each of the ISMS core requirements in Section 6. When uniform practices are established in this Description or the *ES&H Manual*, each directorate references the specified implementing provisions. Directorate Implementation Plans define the safety roles, responsibilities, and authorities for each position-level within their directorate. In addition, some directorates are responsible for cross-cutting institutional functions. These are described in the *ES&H Manual*. The initial Directorate Implementation Plans are subject to an institutional review and approval process to assure that the requirements established in this Description are satisfied.

Accompanying and complementing the Directorate Implementation Plans is the communications and training program described in Section 8.6.

4.6 Institution and Directorate ISMS Interface

This Description defines the ISM core philosophy, requirements, and parameters for the LLNL workforce and work environment. The requirements established in this Description serve as the basis for two key documents in Volume I, Part 2 of the LLNL *ES&H Manual*. In turn these documents define in detail the Laboratory's ES&H policies, practices, and individual responsibilities. The WSS set now in Contract 48 are the currently applicable ES&H standards and serve as the basis for the *ES&H Manual*.

All LLNL work activities are to be performed in conformance with the provisions of the *ES&H Manual* with the assistance of ES&H Subject Matter Experts and the ES&H Teams. Because of the significant differences in the nature of operations across the Laboratory, each AD has the responsibility for ensuring organizational missions are carried out in conformance with the philosophy, parameters, and requirements defined in this Description and the *ES&H Manual*. To facilitate this outcome, each AD has the

responsibility for preparing and using a Directorate Implementation Plan and maintaining any succeeding documentation. The Directorate Implementation Plan summarizes the mechanisms in place to ensure the efficient and effective flow down of the defined safety program. A requirements matrix is used to document the flow down of critical requirements from this Description and *ES&H Manual* through the directorate-level ES&H structures to the individual worker. Regular reviews of each directorate’s ISMS implementation are undertaken to assure continued adherence of each directorate’s operations to the philosophy, requirements, and parameters established in this Description.

4.7 Structure for ES&H Management in LLNL Operations

The basic relationships and groupings of positions and organizational elements contributing to ES&H management at LLNL are depicted in Figure 4.2. This management structure is used for the full range of activities—construction, start-up, routine operations, maintenance, emergencies, and demolition. The figure illustrates the Laboratory’s formal lines of decision-making authority and responsibility and outlines the hierarchy of the organizational elements.

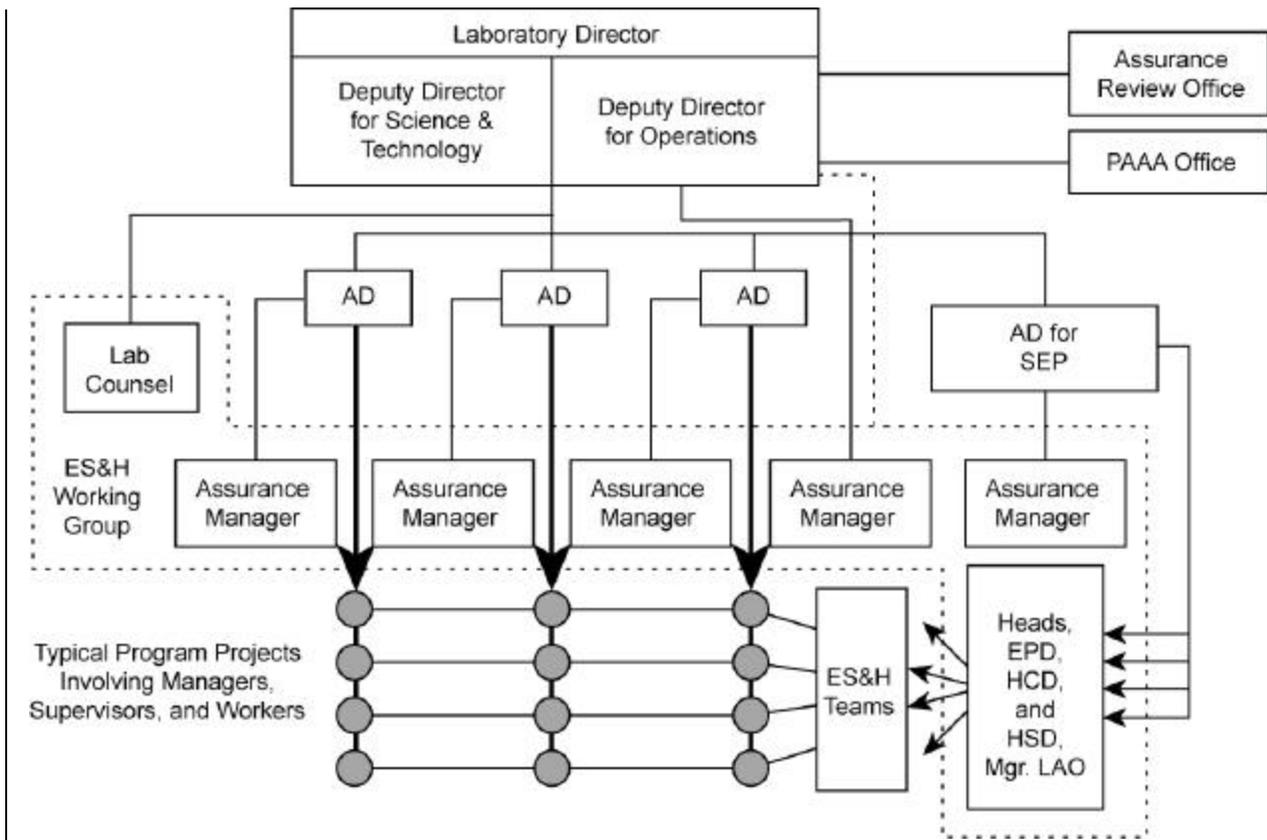


Figure 4.2 Basic organizational structure and connections at LLNL for operations and ES&H management.

The ADs have the direct responsibility and authority for conducting the Laboratory’s programmatic work, and primary responsibility for applying and fulfilling the Laboratory’s ES&H policies in the performance of that work. ADs must be aware of statutory, regulatory, and contractual ES&H requirements applicable to their operations and facilities. In meeting their obligations, each AD can simultaneously function in one or more of the following four operational functions: Program AD, Payroll AD, Facility AD, and Services AD. Authorities for the different operational functions vary, but the Program AD has the primary responsibility. For many mission projects the Program AD is also the Payroll, Facility, and Services AD.

Figure 4.2 also shows the ES&H Working Group composition and how it is connected into the entire organizational structure of the Laboratory. Figure 4.3 depicts the support structure by which ES&H/QA organizations, Subject Matter Experts, and teams interface with all Laboratory programs and organizations. The composition of each team is tailored to the work of specific programs and organizations. An ES&H Team can be configured with a wide range of disciplines, and other arrangements for

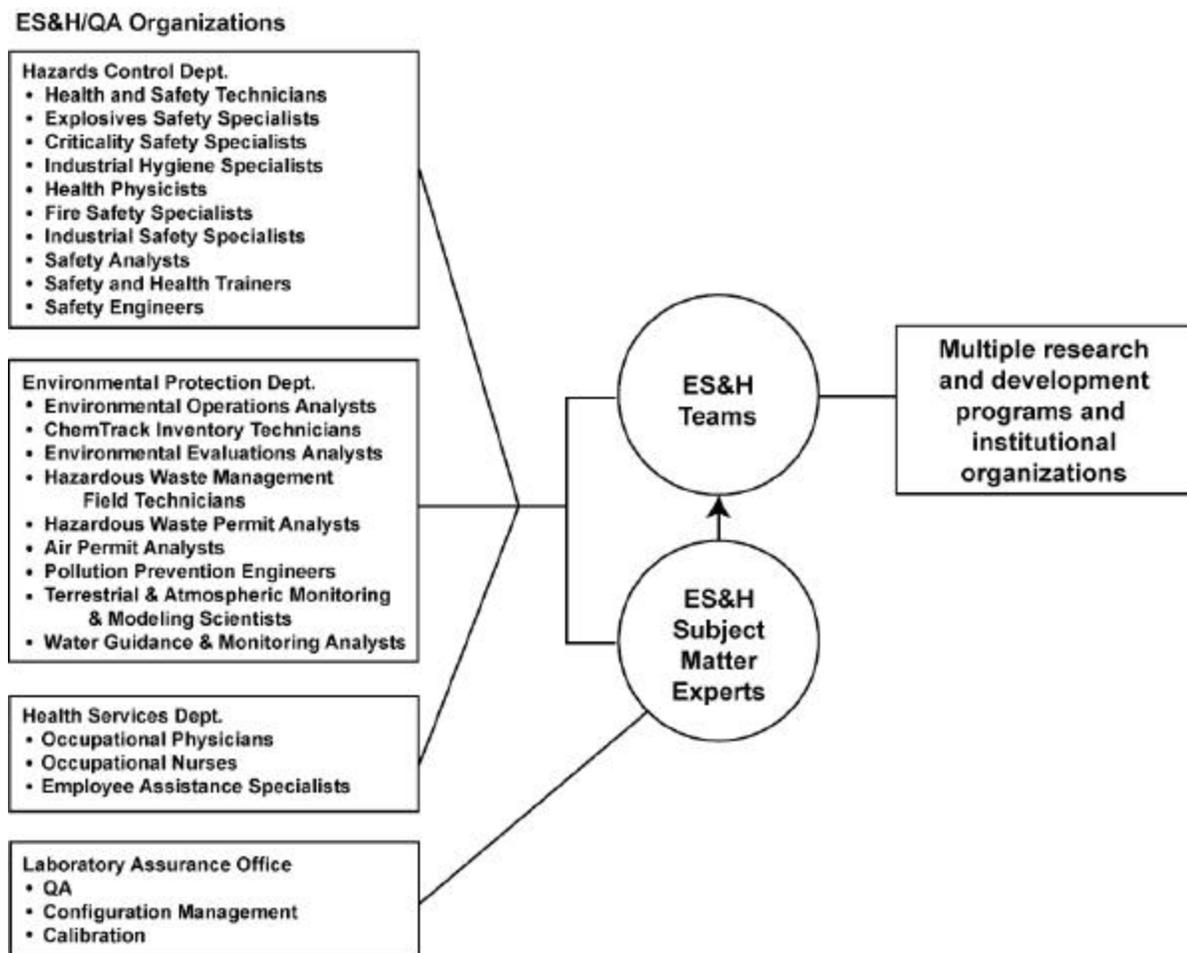


Figure 4.3. Support structure of the ES&H organizations and teams for LLNL programs and organizations.

interactions between Subject Matter Experts and ES&H Teams may be made. In addition, experts from outside the Laboratory can be called in when needed. ES&H Teams are assigned to each directorate and the Director's Office. Details of the ES&H Teams' responsibilities are included in the *ES&H Manual*.

4.8 Gap Analysis Process

4.8.1 ISMS Preparation

A gap is the identifiable difference between an established end point or milestone condition, and an initial or current status condition. There are different kinds of gaps that can exist. In the preparation of the LLNL ISMS, the first and most obvious gaps occurred as a result of the evaluation of the DOE ISM Policy and the accompanying documentation that provided a new formal and uniform structure for operations at DOE organizations. In addressing ISM at LLNL, according to Contract 48, it was realized that the existing ES&H structure had too many differences and needed to be reset into the ISM structure. LLNL has accomplished this through the preparation, improvement, and use of this Description.

4.8.2 ISMS Verification

A gap analysis had been developed for the DOE verification process that identified the differences between the ISMS defined in this Description and what had existed at the Laboratory. Each requirement in this ISMS Description was analyzed for status of implementation. The gaps were categorized into two types: system documentation and system implementation. Planned corrective actions, Responsible Individuals, and estimated completion dates were identified and reviewed during the DOE's verification process. The gap analysis was performed at two organizational levels: institutional and directorate. The institutional gap analysis addressed those requirements that were documented and implemented by the Laboratory as a whole. The directorate gap analyses (one for each directorate) identified the gaps for requirements that were documented and implemented at the directorate level. A "roll-up" summary of the directorate gaps was also provided.

4.8.3 Gap Closure

Institutional and directorate gaps are entered into DefTrack and are being closed in a reasonable and timely manner.

4.8.4 Future Evaluations of the ISMS Using the Gap Analysis Process

As management and organizational changes take place at the Laboratory, any new directorates will need to perform an ISM review to evaluate their compliance status with the ISMSD, and develop their ISM Implementation Plan with the associated directorate gap analysis.

5.0 Interfaces with LLNL Environment, Safety, Health, and Quality Assurance Organizations

5.1 Introduction

For the purpose of this Description, there is a broad definition of safety and efforts have been made to address ES&H in all aspects of the ISMS. However, interfaces specific to environmental, safety and health organizations deserve additional attention. This Section addresses the Laboratory's regard for protection of the environment and promotion of employee health as essential components in the overall safety management system. Critical to the interface with the environmental, health, and hazard control organizations and associated systems is the responsibility of the programs to make the appropriate considerations and inclusions of these parts of "safety" in all their facilities and activities, from planning and startup, through operations, to shutdown and disposal. The LLNL environmental, health, and hazard control organizations provide important expertise, capabilities, and support for the programs, which benefit from their constructive and continuing integration.

5.2 Environmental Protection

Attention to environmental requirements and potential environmental impacts are an integral part of safely planning, operating, or modifying a facility or activity. LLNL, in recent years, has put in place a strong and comprehensive environmental program to protect air, water, soil, cultural, and natural resources as well as to reduce waste generation through careful waste management and pollution prevention measures. This program enables LLNL to be attentive to the Contract 48, Clause 6.7 expansion of the definition of safety by "including pollution prevention and waste management." LLNL emissions to air, water, and waste streams are controlled, monitored, and reported in compliance with environmental laws and regulations. LLNL publishes an annual environmental report that summarizes the regulatory compliance status and provides the monitoring data collected during the year with an analysis of that data and a comparison with previous years. The LLNL ISMS requires the evaluation of the consequences of potential new environmental hazards in facilities and activities and implementation of appropriate controls or mitigation measures.

The environmental program is institutionally managed by the Environmental Protection Department (EPD). EPD is responsible for ensuring that the institutional environmental element of safety, as defined and used in this Description, is effectively carried out in the LLNL ISMS. The environmental program has three primary responsibilities:

- 1) Cleanup of contamination from past operations and restoration of sites.

- 2) Waste management (handling, treatment, and disposal of generated hazardous, radioactive, and mixed wastes).
- 3) Environmental compliance and monitoring support for ongoing activities.

The first and second of these responsibilities are environmental program elements within EPD. The second and third are the primary mechanisms through which the environmental element is integrated into the ISMS.

Each of LLNL's programs is responsible to comply with environmental requirements in the WSS set in Contract 48. The environmental program supports this in two ways:

- 1) Environmental analysts provide direct environmental support to the programs through the ES&H Teams. They assist the programs in meeting environmental requirements in a timely, cost-effective manner.
- 2) Institutionally funded environmental Subject Matter Experts provide specific guidance, oversight, and compliance/surveillance monitoring. They support the ES&H Teams through the environmental analysts.

The ES&H Teams are structured to provide consistent environmental guidance and solutions across the Laboratory's programs. Each ES&H Team includes an environmental analyst who has broad-based environmental expertise and has the lead responsibility for identifying, interpreting, and communicating environmental requirements in each of their areas to the appropriate LLNL program personnel. The environmental analyst works in concert with the institutionally funded environmental Subject Matter Experts to assist programs to understand and comply with all applicable requirements. In particular, they are responsible to assist LLNL personnel to integrate environmental planning and compliance into their projects and operations. This integration is done in a manner that ensures that safety is a prime consideration in meeting environmental requirements.

Environmental analysts work with the program staff to understand their operational needs and to communicate requirements, best management practices, and best available control technologies applicable to a specific task. If required, the Subject Matter Experts work with the program contact to prepare the necessary permit applications and negotiate conditions with regulatory agencies on behalf of the program, as appropriate, to obtain the most workable and cost-effective permitting conditions.

Periodic re-evaluations result from many mechanisms: annual permit renewals, annual reports submitted to regulatory agencies or DOE, monitoring results, changes in regulations, and changes or additions to activities at the Laboratory. Other types of assessments also initiate reviews of activities, such as National Environmental Policy Act (NEPA), Integration Work Sheet/Safety Plan (IWS/SP) and Facility Safety Plan (FSP) reviews, and facility self-assessments. These reviews may result in the need to

modify or obtain permits, develop additional mitigation requirements, or make changes in monitoring programs.

LLNL operations generate wastes and emissions despite ongoing efforts to plan and operate activities in a manner that eliminates the potential for environmental impacts. Processes and procedures are in place, including clear assignment of responsibilities and authorities, to ensure that wastes and emissions are appropriately controlled. Periodic visits by environmental analysts to facilities, reviews of logs and other required documentation such as IWS/SPs and FSPs, and ongoing communications with ES&H specialists help to ensure that all appropriate controls are properly implemented and functioning.

Hazardous and radioactive waste management is also integrated into work planning and implementation through a number of routes. Radioactive and Hazardous Waste Management Field Technicians are assigned to most directorate facilities to assist program personnel in managing their hazardous and radioactive wastes. Generators of hazardous waste are trained to understand applicable aspects of waste management as well as the importance of minimizing waste generation. The focus of this training is to ensure individuals understand their environmental responsibilities under the environmental element of ISM. The Waste Certification Program is aimed at ensuring waste-type specific (low level, mixed, etc.) certification program requirements are met. In addition, Radioactive and Hazardous Waste Management personnel work closely with generators to characterize and profile wastes and waste streams. As a final check, waste is sampled and analyzed under a directed quality assurance program to verify the accuracy of generator characterization.

Environmental Subject Matter Experts also conduct environmental surveillance, monitoring and analysis both on- and off-site, effluent monitoring, and computer simulation modeling to assess impacts of ongoing LLNL operations on the environment. Other environmental activities conducted by the environmental program include monitoring sensitive and endangered species, wetlands, and cultural resources; conducting groundwater clean-up; transportation of hazardous materials; chemical inventory tracking; pollution prevention activities; and underground tank management. These are all taken into account as LLNL programs plan how they will operate in a safe and environmental compliant manner.

In addition to general ES&H training, specific environmental training courses have been developed to meet program needs. These include training for LLNL personnel on water management, air quality requirements, waste management, and other environmental compliance areas.

The environmental analysts conduct field visits and work individually with LLNL program staff to assess how well systems are working to achieve programmatic needs, control potential environmental impacts, and meet compliance requirements. Self-

assessments conducted routinely by each responsible LLNL program are key in ensuring all environmental issues are addressed. There are also numerous independent inspections by regulatory agencies and observations by DOE oversight personnel. These serve as important indicators that environmental regulations have been correctly interpreted and appropriate environmental controls are in place and functioning.

The environmental analysts in the field must also consider their responsibility for executing an integrated ISM program by evaluating the hazards associated with their work activities along with the environmental issues. When in the field doing assessments of programmatic activities, safety and health professionals are generally also available to assess the ISM safety- and health-related aspects of programmatic activities.

In summary, the LLNL environmental program and integration of environmental considerations into all Laboratory activities is being further enhanced by many of the mechanisms applied through the ISMS.

5.3 Health Services

A key element of ISM is ensuring that the workers have the necessary physical capabilities and monitoring so their health is not adversely affected on the job. The management chain has the responsibility to see that those conducting the work are physically capable of those work tasks. The Health Services Department (HSD) at LLNL provides a comprehensive occupational health program to assist the management chain in meeting this key ISM element. The assessment of physical capabilities is a part of the last four of the five DOE Core Functions, as follows.

Analyze the Hazards—The physical requirements of the job must be assessed. For appropriate assignments, use of a Job Demands' Worksheet outlining the essential physical capabilities of the job can assist the management chain in identifying these requirements. In addition, required certifications (e.g., respirator approval, HRP) or required medical surveillance (e.g., beryllium, asbestos exposures) may be identified.

Develop and Implement Hazard Controls—The management chain can identify whether or not specific professional review by HSD is required. For instance, a member of the management chain may control hazards by referring a potential worker to HSD for an examination to determine if the worker is physically capable of safely performing the identified tasks. Other prestart certifications, medical approvals, or baseline exams may also be performed.

Perform Work within Controls—Assessing any changes in a worker's physical readiness is a continuous responsibility for the management chain during the work process.

Provide Feedback and Continuous Improvement—Feedback information on the adequacy of safety controls is gathered. This is most often done through medical surveillance to determine if workers have been injured or developed illnesses during the work process.

Incorporated into the ISMS process, HSD has clinicians integrated into the ES&H Teams. These clinicians work with the management chain as well as with other ES&H professionals to help identify and control workplace hazards and to assess the need for special medical examinations before work is initiated.

A range of other resources is made available to individual employees and to the management chain who are planning the work process or assessing the adequacy of controls. LLNL provides medical consultations and an Employee Assistance Program for psychological assistance. Training, management consultation, and individual evaluations are available on workstation ergonomics and back injury prevention.

An important part of LLNL's overall safety system is the Return to Work Program. HSD has an active role in rehabilitation of the injured worker. HSD works with the management chain to return injured employees to work in a safe and timely manner. This effort helps to reduce lost work time and permanent disability by giving injured employees modified work until they can resume full activity.

The overall health of employees is an important factor in their ability to work effectively and safely. HSD provides opportunities for employees to improve their general state of health and physical readiness. A health risk appraisal program is available that helps employees to identify and modify personal health risk factors. Special programs are available for initiating exercise, improving diet and controlling weight, understanding and controlling blood pressure, and managing stress. HSD also offers routine preventive services such as flu shots and cholesterol screening.

5.4 Hazards Control

The Hazards Control Department (HCD) employs professional specialists and technical personnel who have expertise in industrial safety, industrial hygiene, explosives safety, criticality safety, fire fighting, fire protection, health physics, safety analysis, safety and health education, training, and research. In collaboration with the other ES&H Departments, Health Services, and EPD, HCD leads in integrating risk minimization and control of workplace hazards into the thoughts, plans, and actions of Lawrence Livermore management and staff. In addition, the department provides analytical equipment and laboratory services to LLNL programs and organizations. These facilities and services include the Analytical Laboratory, Industrial Hygiene Instruments and Measurements Laboratory, Radiation Calibration Laboratory, Personnel Dosimetry, Respirator Services, Bioassay Laboratory, and Whole Body Counting Laboratory.

The HCD is an integral component of LLNL's ISMS. HCD provides expertise, guidance, and support to Laboratory programs and support organizations in their effort to perform work safely. The goals of this effort are to prevent accidents, maintain a safe workplace, minimize exposure to harmful agents, and control emergency situations. Key interfaces are the ES&H Teams and direct institutional support.

HCD manages the ES&H Teams, which are comprised of ES&H professionals and technicians from the Environmental Protection, Hazards Control, and Health Services Departments. The composition of each team is tailored to the work of the specific programs and organizations that they support. The teams are the key interface between line organizations and the ES&H support organizations. As such, they are responsible for providing technical support and consultation to authorizing organizations during operations, including emergencies. Specific responsibilities include:

- Assisting authorizing organizations with identifying and analyzing ES&H hazards and in meeting mandatory requirements. The teams, working with Subject Matter Experts, also advise authorizing organizations of controls that eliminate or minimize identified hazards and concerns.
- Providing guidance to authorizing organizations about developing and reviewing safety-related plans, procedures, and documents.
- Independently performing ES&H surveillance of and feedback on planned and ongoing operations, facilities, equipment, and procedures and recommending corrective actions to the cognizant management.
- Immediately stopping any activity that presents imminent, uncontrolled, high-risk threat to human safety, health, or the environment.
- Monitoring the work environment to identify areas of non-compliance with applicable requirements in the *ES&H Manual* and WSS set.
- Conducting independent accident and incident evaluations and assisting management in formal incident analyses.

In addition to providing direct ES&H support to line management via the ES&H Teams, HCD also provides institutional Subject Matter Experts to assist with policy and procedure development and to deliver institutional level safety services. Specific responsibilities in this area include:

- Interpreting controls required by the WSS set, including DOE directives as well as health and safety laws and regulations with the assistance of Laboratory counsel.
- Documenting and maintaining a record of all occupational injuries and illnesses.

- Providing analytical laboratories in support of industrial hygiene and radiological safety activities.
- Providing health and safety education and training that meets institutional and regulatory requirements.
- Providing emergency preparedness and emergency response services. Also participating as members of specialized response teams [Accident Response Group (ARG), Nuclear Emergency Search Team (NEST), Radiological Assistance Program (RAP)].
- Producing the safety-related portions of the Laboratory's *ES&H Manual* and other publications that give consistent up-to-date guidance on health and safety issues and the WSS set.
- Participating as a key member of the ES&H Working Group to advise the DDO regarding ES&H issues.

In summary, HCD has established interfaces with the other ES&H Departments (EPD and HSD) to provide ES&H services to all Laboratory programs and support organizations. The key interface is the multi-discipline ES&H Teams that work to integrate ES&H considerations into all Laboratory activities through the ISMS.

5.5 The Laboratory Assurance Office (Quality Assurance)

Quality Assurance (QA) tools and techniques are similar in many aspects to ISM principles. The Ten Criteria defined in DOE O 414.1A (QA Order) and 10 CFR 830 Subpart A (QA Rule) define a management system that, when implemented, addresses the implementation of the ISM principles. Consequently, both the QA Order and the QA Rule require that the two systems be integrated or that the contractor explain how the QA criteria apply to the safety management system. Document 41.1, "LLNL Quality Assurance Program," in the *ES&H Manual* explains the relationships between the two sets of requirements.

The Laboratory Assurance Office (LAO) has the institutional responsibility of preparing and maintaining the Quality Assurance Program (QAP) consistent with the requirements of the QA Order and QA Rule. The Laboratory QA SME is assigned to the LAO. The LAO reviews directorate level QAPs and advises the CCB and PAAA Office on QA issues.

The LAO is also assigned responsibility for the Laboratory Configuration Management Program and the Laboratory Calibration Program.

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6.0 Safety Management System Mechanisms

6.1 Introduction

This Section identifies the set of core requirements, applicable to all LLNL organizations, that provides the foundation for safety management at LLNL. These core requirements are further addressed, consistent with the purposes of this Description, in subsequent sections as cited. They appropriately include the necessary specificity and detail required for implementation and use directly and through other LLNL documentation. The *ES&H Manual* is the principal mechanism for the implementation. A crosswalk matrix of the core requirements contained in this Section and the *ES&H Manual* is maintained by the LLNL ES&H Information Management Office to provide an expedient and readily maintained connectivity. The next level of implementation is through the Directorate Implementation Plans with the continuation in any succeeding documentation.

LLNL uses a work structure that serves to ensure work is performed safely and in compliance with applicable safety requirements consistent with the graded approach. The work control process for Superblock facilities is implemented more rigorously. See Section 16, “Appendices”, for additional detail. The primary focus of the LLNL ISMS is to provide the worker with a sound work environment, ensure necessary resources are made available to perform the job, and establish requirements for adequate procedures and controls to ensure the work is performed safely. It is to this end that the safety roles, responsibilities, and authorities are developed and practiced.

Planning the work activity is the starting point for analyzing and understanding hazards and determining specific safety requirements and controls. Figure 6.1 illustrates that safe work at the Laboratory is accomplished by applying the five DOE Core Functions discussed in Section 4 in the Institution/Facility/Activity Process.

An activity must satisfy requirements based on its defined work scope and hazard analysis and the applicable controls established by the institution and the facility where the activity is conducted. The institutional requirements presented in this Description are used to ensure Laboratory-wide consistency. (See Section 3 for explanation of Institution.) Similarly, a facility may establish a required practice or limit to ensure consistency of operations within the facility. Information gained from evaluations of the work—operational results, worker suggestions, self-assessments, audits, etc.—is used to adjust and improve requirements and controls at the work activity, facility, and institutional levels.

LLNL’s ISMS requirements are presented in a manner consistent with the NNSA/OAK guidance letter (Ref. 5). LLNL has expanded on the seven DOE Guiding Principles by adding an LLNL Fundamental Guiding Principle. This additional principle is included

to clarify and stress the responsibilities and accountability of every Laboratory employee and, accordingly, has been incorporated into the Roles and Responsibilities (See Section 6.2.1).

Section 6.2 defines the core requirements and the roles, responsibilities, and authorities associated with the LLNL Fundamental Guiding Principle and the three DOE Guiding Principles that especially pertain to all five DOE Core Functions while recognizing the values in all seven DOE Guiding Principles. Each of the subsequent Sections, 6.3–6.7, delineates the core requirements and the specific roles, responsibilities, and authorities intended to address the particular DOE Core Function covered in that section. Sections 6.3–6.7 also describe the safety management system mechanisms developed to ensure adherence to each of the corresponding DOE Guiding Principles. Again, “safety” throughout this document is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment as defined in DOE P 450.4. Contract 48, Clause 6.7 expands the definition of safety by “including pollution prevention and waste minimization.” In a similar context, the use of “hazards” includes environment and health hazards as well as safety hazards.

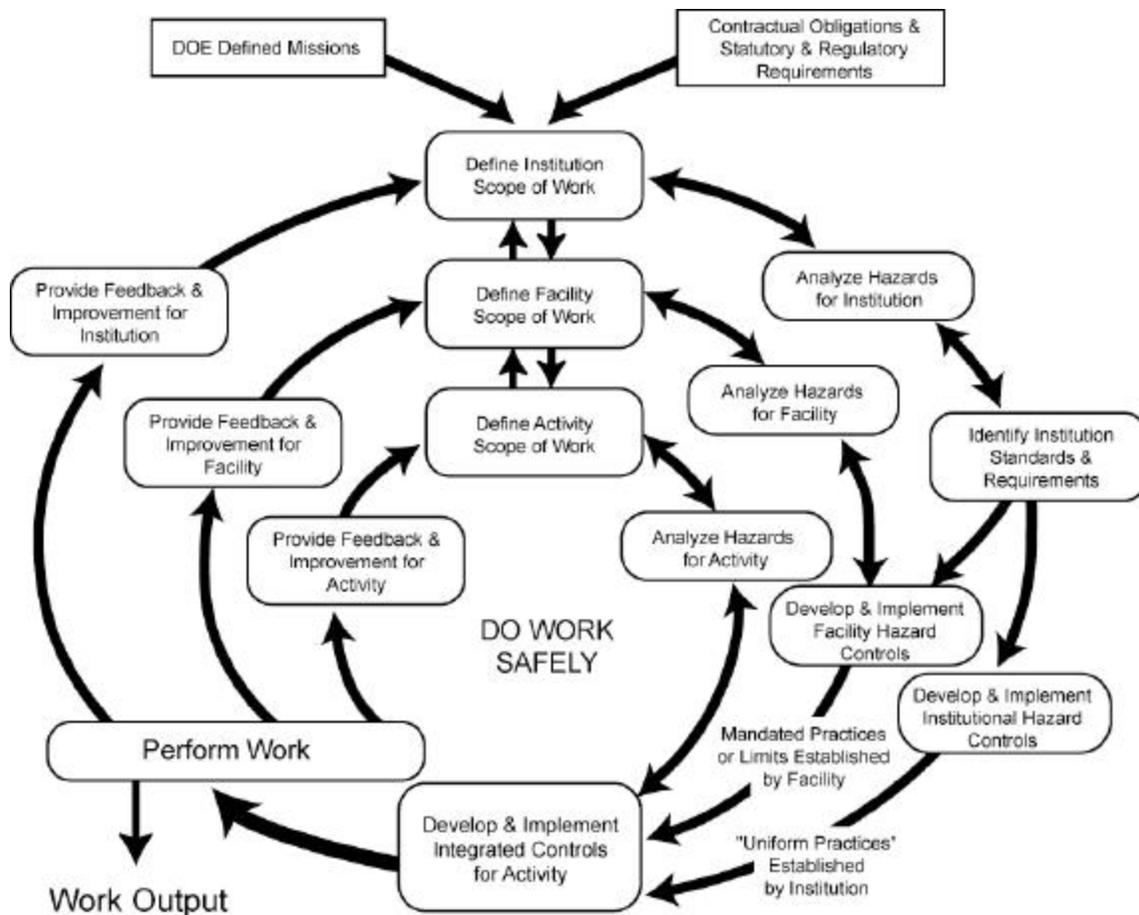


Figure 6.1 Institution-Facility-Activity ISM Work Cycle Structure for LLNL.

6.2 Roles and Responsibilities

6.2.1 LLNL Fundamental Guiding Principle

Each worker, supervisor, and manager is directly responsible for ensuring his or her own safety and promoting a safe, healthful, and environmentally sound workplace and community.

6.2.1.1 Accountability

- 1) The Laboratory's goal, simply put, is to practice safety by taking actions to avoid the potential for injury to people or damage to property. The principal means of establishing and enforcing accountability for ES&H are: a) communicating ES&H expectations to employees; b) reinforcing expectations through timely verbal feedback; c) formal appraisal and salary actions implemented annually for each employee (see 6.2.2.1); d) awards and recognition for notable contributions to ES&H; and e) corrective action in cases of employee misconduct. Corrective action policies and procedures are contained in the *Laboratory's Personnel Policies and Procedures Manual*, Section E, II. Corrective Action.
- 2) Each employee is directly responsible for ensuring his or her own safety and the safety of others that could be impacted by their actions. All members of the workforce are held accountable for meeting the Laboratory's ES&H requirements as defined in this Description and the WSS set in Contract 48, and as detailed in the LLNL *ES&H Manual* and other approved manuals, plans, and procedures.
- 3) Accountability applies to all levels of employees including managers and supervisors and contains positive reinforcement for meeting Laboratory safety expectations and negative consequences for failing to do so. The management of each directorate is responsible for having in place effective processes to implement, measure, and reinforce Laboratory safety expectations. Each directorate is to use its directorate awards and recognition program to promote exemplary safety behavior and performance.
- 4) Each directorate will hold its employees accountable for compliance with Laboratory ES&H requirements through personnel processes such as performance appraisals, ranking, salary management actions, awards and recognition, and the application of corrective action. In addition:
 - a) Each worker, immediate supervisor, and manager is directly responsible for ensuring accidents and injuries are properly reported. Accurate and complete reporting is necessary.
 - b) All employees are responsible for bringing safety concerns promptly to the attention of the appropriate manager or supervisor for resolution. If a satisfactory response is not received, then the senior manager for the

organization should be contacted and then the AD for the Safety and Environmental Protection Directorate (SEP).

- 5) Feedback and corrective action will be taken consistent with Laboratory personnel policies and procedures for violations of Laboratory ES&H requirements. Feedback may be verbal or written. Corrective actions may include the following, depending on the nature and severity of the violation: written warning, suspension without pay, permanent or temporary salary reduction, demotion, and dismissal. Corrective actions must be coordinated through the Office of Staff Relations to assure uniform application within the Laboratory.
- 6) Each payroll organization is to maintain records of all safety awards and corrective actions it administers. A summary of these records is to be reported to the DDO no later than one month after the end of each calendar year. The DDO is to compile these reports into a Laboratory summary for management information and use.
- 7) When an incident or a systemic failure occurs that affects worker safety, the environment, or public health, the organization authorizing the work is responsible for ensuring an investigation of the relevant circumstances or assisting DOE investigators in conducting a review that falls within their purview. Necessary changes are to be made to the relevant policies, procedures, or hardware based on the findings of the authorizing organization's review.

6.2.2 DOE Guiding Principle 1—Line Management Responsibility for Safety

Line management is responsible for the safety system and is ultimately responsible for safety at the Laboratory.

6.2.2.1 Safety performance directly affects appraisals and salary actions

- 1) Safety expectations are to be established for each employee, including supervisors and managers. Expectations are to be documented and communicated and the employee given the opportunity to provide feedback.
- 2) A substantive assessment of safety performance is to be included in each individual's performance appraisal, addressing expectations and accomplishments. For managers and supervisors, the appraisal is also to address performance in establishing and implementing safety processes.
- 3) Safety responsibilities and safety performance are to be explicit considerations during the annual ranking process and important factors in determining salary actions and promotions.

6.2.3 DOE Guiding Principle 2—Clear Roles and Responsibilities

Clear roles and responsibilities are established and maintained.

6.2.3.1 Safety roles, responsibilities, and authorities (RRAs) for organizations and individuals are clearly defined

- 1) The authorizing organization is responsible for authorizing work. Authorizing organizations are distinguished by having control of the funding as well as responsibility to the sponsor for accomplishing the programmatic mission or activity.
- 2) The responsibility for work authorization may be delegated to another organization along with the funds to accomplish a specific work element. All delegations of work authorization responsibility must be formally documented and approved by the management of each directorate involved. Irrespective of the number or level of work authorization delegations, the program organization retains ultimate responsibility back to the sponsor for the conduct of the work.
- 3) Work performed as services by one organization for another is an area of particular concern requiring special attention. The appropriate division of safety roles, responsibilities, and authorities (RRAs) between the requesting and the services organizations, based on the type of services, is specifically addressed in the *ES&H Manual*.
- 4) The authorizing organization is responsible for the activity's conduct, including accomplishing the technical objectives and safety requirements within the defined budget. The individuals responsible for: a) authorizing the work activity; b) validating that the proposed work falls within the established safety envelopes (i.e., facility or operational concurrence); and c) supervising the specific work (i.e., ensuring work requirements are met); must be clearly identified and their safety RRAs clearly defined.
- 5) The individual supervising work is responsible for identifying the job assignments that have specific safety RRAs, and assuring that they are clearly defined. The requirement for safety RRAs may be satisfied by one or more of the following: 1) referencing a position-specific ES&H responsibility statement in the Directorate Implementation Plan and any succeeding documentation; 2) listing the ES&H responsibilities assigned to the position as delineated in ES&H documents (e.g., *ES&H Manual*, FSPs, and IWS/SPs); or 3) using an equivalent approach defined in the Directorate Implementation Plan and any succeeding documentation.
- 6) The position-specific safety RRA information is to be provided to the individual performing the work and be readily accessible to others as described in the Directorate Implementation Plan and any succeeding documentation.
- 7) To ensure that facilities are properly managed, coordinated, and conducted, each Facility AD is responsible for identifying a FPOC and an alternate for each facility to fulfill responsibilities identified in the *ES&H Manual*.

- 8) Each directorate is to have an Assurance Manager to provide independent oversight of the directorate's organizations, facilities, and activities to assure the proper implementation of the ES&H program. In this context, "independent" means that the Assurance Manager is not in the direct line of authorization or management of the activities being evaluated. When this condition is not met, there shall be a separate independent evaluation of the activity to eliminate any potential conflict of interest.
- 9) LLNL's ES&H organizations are responsible for supporting the management chain by participating in work activity planning, monitoring operations for compliance, and providing the information needed to the appropriate staff and management to help maintain a safe work environment.

6.2.3.2 The management chain is defined for each work activity

- 1) For each work activity, the individuals serving in the management chain (i.e., first-level Responsible Individual up to the responsible AD) are to be identified by the organization authorizing the work. The management chain has direct control over the funding for the work activity. Figure 6.2 shows a basic framework of the overall function structure for the LLNL mixed matrix organization in an extension and clarification of the operational functions, now comprised of program, payroll, facility, and services. In this basic framework, the management chain exists for all LLNL operations down a clear line of funding and ES&H responsibility both directly and through formal Delegation and Acceptance Agreements. Nominal and special case scenarios have been demonstrated, and Section 8.4 presents additional information and four typical operational cases. Many ADs have all operational functions in their directorates. The Responsible Individual and first-line supervisors are key individuals in the structure; they must know their people, the work, and the structure both up and down as well as across the structure.
- 2) The management chain is responsible for: a) defining the scope of work; b) ensuring that the hazards control system is effectively implemented; c) ensuring that workers have the skills, knowledge, and abilities (SKAs) to initially evaluate the hazards associated with an activity; d) ensuring that workers have the SKAs, including physical capabilities, to perform the assigned work safely; e) authorizing the defined work, subject to the appropriate controls; f) ensuring that the workers perform the work safely and in conformance with applicable institutional, facility, and activity controls; g) monitoring and, as appropriate, strengthening the work activity's safety performance; and h) soliciting worker input.

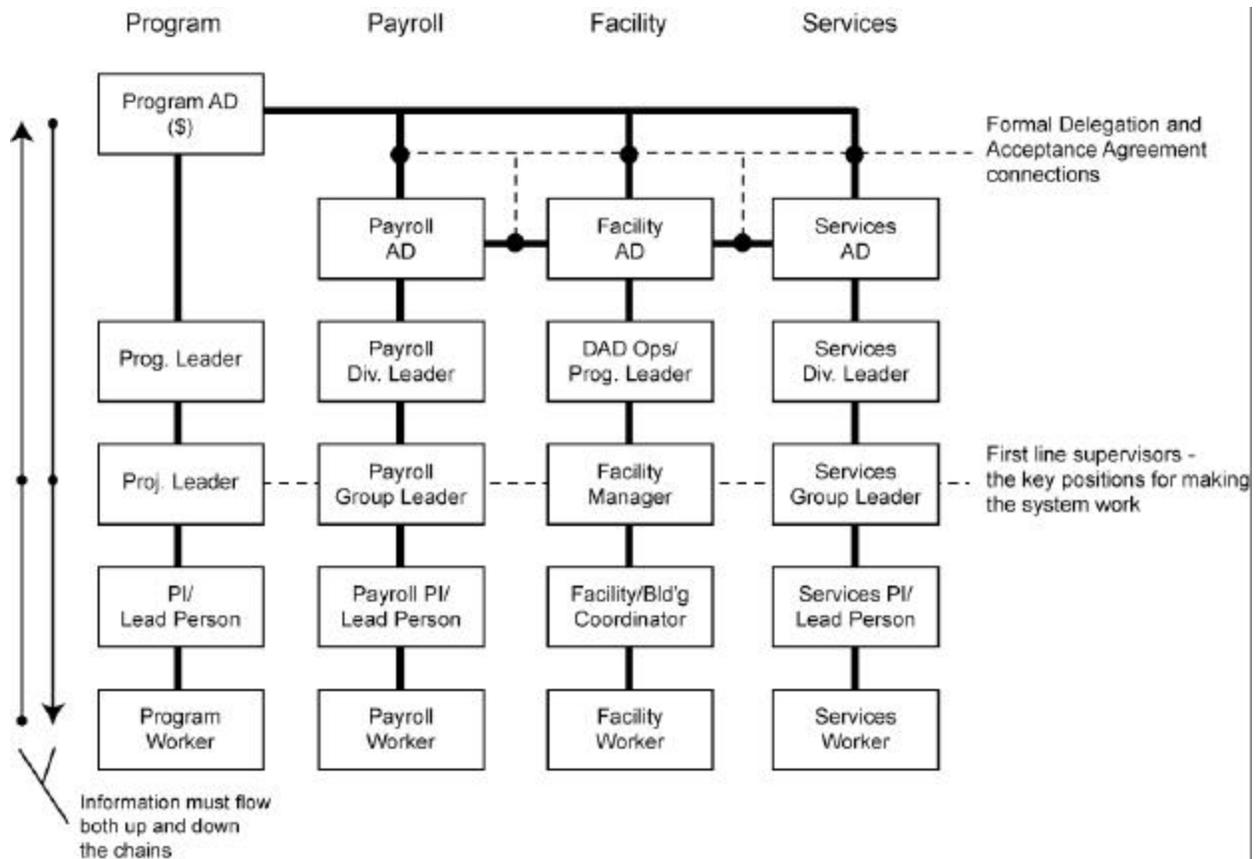


Figure 6.2 Use of the basic framework of operational functions provides clear management chains for all LLNL operations in the overall structure for the LLNL mixed matrix organization.

6.2.3.3 Processes for case management of “lost and restricted work days” are defined.

- 1) The objective of a case management program is to return injured personnel to work as soon as reasonably possible, consistent with the individual’s personal health and safety.
- 2) Each AD is responsible for putting in place within their organization a “lost and restricted workdays” case management program consistent with LLNL’s institutional case management program guidelines in the *ES&H Manual*.

6.2.3.4 LLNL’s commitment to safety and ISM is extended to subcontractors and subcontract employees for whom LLNL has safety responsibility

- 1) To ensure that the Laboratory’s commitment to safety and ISM is extended to all of its service subcontractors, lower-tier service subcontractors, and their employees, safety requirements are to be incorporated into the subcontracts, as appropriate, and flowed down to the lower-tier subcontractors, as appropriate. The

subcontractors are responsible for the flow down of safety requirements to their lower-tier subcontractors and the safety interactions with them.

- 2) Those activities identified on the Designated Commercial Services List (Ref. 10) are determined to be non-complex and non-hazardous when performed in a work location having only negligible hazards present. Non-complex and non-hazardous are excluded from the ISM contractual flowdown requirements. The Designated Commercial Services List can be found at the following web address:

http://www-r.llnl.gov/pm/pdf/comm_serv_list.pdf

- 3) An ES&H specialist (ES&H Team) determines selection of the appropriate subcontractor safety requirements to ensure subcontractor ES&H procedures appropriately meet Laboratory standards. All appropriate hazards are to be communicated between the Laboratory and the service subcontractor. Hazards to be communicated include the Laboratory's work activity and facility work area hazards and the subcontractor's work activity hazards.
- 4) The subcontract safety requirements are to be consistent with the flowdown requirements of Contract 48, Clause I.074 and this Description. The Procurement and Materiel Department (P&M) is to use Contract 48 and description requirements and the subcontractor safety requirement determination to select the appropriate subcontractor safety requirements according to P&M procedures.
- 5) The organization requesting a subcontract for work is to evaluate the planned subcontract work using the Procurement Worksheet (PWS) process as described in the *ES&H Manual*. The appropriate ES&H Team is to be used to assist the requesting organization in making the determinations, as necessary. The appropriate ES&H Team is to be notified of all requests for a subcontract where the work is categorized as complex or hazardous. Subcontractor interaction on the development of their hazards and controls may be necessary and can be facilitated through use of a generic or tailored Task Identification Process (TIP) List.
- 6) The subcontractor is to be informed of the applicable Laboratory location hazards for the work activity. The subcontractor must also obtain the appropriate training as determined by the ES&H Team.
- 7) A subcontractor performing work categorized as complex or hazardous is required to manage and perform the work according to the subcontractor's safety management system, which, at a minimum, must fulfill the requirements of Contract 48, Clause I.074 and be available for Laboratory review through P&M. In addition, at the determination of the ES&H Team, a subcontractor may be required to provide a site- and/or job-specific safety plan based on its safety management system. P&M is to obtain this plan. The requesting organization and the appropriate ES&H Team are to review it for operational and technical accuracy and completeness. Then, together with P&M, they provide the approval through P&M.

8. Subcontractors or service providers previously reviewed by the government and under an approved ISM program (e.g., SNL, INEEL, SR, Y-12) do not need to demonstrate to the Laboratory their safety management system. Employees from such service providers are to be treated like LLNL employees for safety and are required to satisfy all Laboratory ES&H requirements specified in applicable Laboratory safety documentation (e.g., IWSs, IWS/SPs, FSPs, Superblock work control documents) when performing services for the Laboratory.

6.2.3.5 Safety documents are written so that they are readily understandable by the individuals performing and managing the work

- 1) The purpose of the Laboratory's safety documents (i.e., manuals, plans, and procedures) is to enable all employees, subcontractors, and visitors to work safely and in an environmentally sound manner.
- 2) The authors and approving organizations of safety documents are responsible for ensuring that instructions are workable and readily understandable to the individuals performing and managing the work. The authors and approving organizations are likewise responsible for ensuring that safety documents are consistent with applicable rules and requirements.
- 3) In situations where requirements are particularly complex or ambiguous, the organization authorizing the work is to use the appropriate ES&H professionals and other Subject Matter Experts to interpret and assist in developing ways to satisfy requirements.
- 4) Workers are strongly encouraged to be actively involved in the development of operating procedures specific to their work activities.
- 5) The resulting safety documents are to be readily available to all individuals who need access to the information.

6.2.4 DOE Guiding Principle 3—Competence Commensurate with Responsibilities

Personnel possess competence commensurate with responsibilities.

6.2.4.1 Individuals are qualified to perform assigned work

- 1) Each individual must possess the necessary skills, knowledge, and abilities, including physical capabilities, to carry out their assigned tasks. The base skills are to be ensured by the Payroll organization.
- 2) The individual supervising the work activity is responsible for identifying: a) the qualifications, including appropriate medical certifications, and surveillance necessary to carry out the work and b) the individuals with the qualifications and training to perform the work.

6.2.4.2 Individuals receive appropriate job-specific safety training

- 1) Payroll organizations ensure base skills through the hiring process and performance review.
- 2) The individual supervising the work activity is responsible for ensuring that the training necessary to do the assigned work safely is identified and communicated to the Payroll organization.
- 3) All personnel are to receive training to perform their work in a safe and environmentally sound manner.
- 4) Training, with appropriate testing or evaluation, demonstrates competency to meet safety standards and facility- and activity-specific requirements.
- 5) Accomplishment of safety training is documented in the Livermore Training Records and Information Network (LTRAIN).
- 6) The authorizing organization is responsible for ensuring that the resources necessary for required safety training are provided by that organization or another appropriate organization.
- 7) Payroll organizations are to verify that their personnel have the required training.
- 8) The work activity Responsible Individual is to ensure that the personnel supporting their activities have the required safety training, including facility-specific training.

6.2.4.3 Individuals receive appropriate ISMS training

- 1) All Laboratory employees are to be trained in the principles and functions of ISMS at a level appropriate for their specific job duties and responsibilities. The Laboratory is responsible for developing the institutional ISMS training courses.
- 2) Each directorate is responsible for ensuring that their employees receive ISMS training, including facility- and activity-specific training as appropriate, in an effective and timely manner.
- 3) Each directorate is responsible for assuring that the required ISMS training is appropriately documented in the LTRAIN system.

6.3 Work Planning and Prioritization**6.3.1 DOE Core Function 1—Define the Scope of Work****6.3.1.1 The work activity is defined**

- 1) The organization authorizing the work activity is responsible for: a) stating the technical objectives; b) defining the work elements to be performed; c) identifying the facility in which the work will take place; and d) identifying the individual who will be supervising the work activity.

- 2) The management chain that results from these determinations is responsible for ensuring the work activity is properly analyzed, controlled, performed, and monitored.

6.3.1.2 The graded approach process is consistently applied

- 1) An individual may initiate and perform a work activity without the imposition of formal work controls, if it involves only activities commonly performed by the public as explained in the *ES&H Manual*. In no instance shall an individual initiate or perform a work activity not commonly performed by the public without the approval of an appropriate person in their management chain.
- 2) The authorizing organization is responsible for ensuring that the greater the hazards associated with an activity the more rigorous the work planning process that will be required. The objective of the work planning process is to ensure the hazards associated with the work activity are clearly understood and appropriately addressed. To ensure this objective is met, relevant ES&H professionals and Subject Matter Experts are to be used during the work planning process, as appropriate. These individuals provide advice on application of the *ES&H Manual* and applicable WSS so as to ensure consistent implementation across LLNL.
- 3) Consistent with the provisions and levels described in Section 7 and the *ES&H Manual*, the individuals responsible for: a) authorizing the work activity; b) ensuring the facility and/or operational safety envelope; c) supervising the work; d) providing the safety support; and e) assuring worker involvement in the analysis of hazards and determination of appropriate work controls to be applied to the work activity.
- 4) Work is to be authorized by the appropriate level of management as described in Section 7 and expanded upon in the *ES&H Manual*.

6.3.2 DOE Guiding Principle 4—Balanced Priorities

Resource allocations are balanced, making ES&H a priority in project planning and execution.

6.3.2.1 Resource planning processes ensure balanced priorities

- 1) The authorizing organization is responsible for allocating sufficient resources to ensure safe and compliant operations.
- 2) A work activity proceeds only with a reasonable expectation by the management chain that there will be sufficient resources to ensure safety requirements are satisfied over the length of the project, including closeout activities.

6.4 Hazards Analysis

6.4.1 DOE Core Function 2—Analyze the Hazards

6.4.1.1 Hazards are identified and analyzed for all work activities

- 1) The authorizing organization is responsible for ensuring that the associated hazards are identified. ES&H professionals are to be used in the hazard identification process, as appropriate. Workers are to be provided an opportunity to participate in the process of identifying hazards.
- 2) Hazards are to be identified and analyzed consistent with the provisions of the *ES&H Manual*. ES&H professionals and Subject Matter Experts provide advice on application of the *ES&H Manual* and applicable WSS so as to ensure consistent implementation across LLNL.
- 3) Each individual is responsible for making conscious considerations of the safety implications of their actions whether or not formal hazards analysis and documentation are required.
- 4) Facilities in the Superblock, including the Radiography Facility (B-239), use a similar but more rigorously applied work control process. This process, outlined in the Appendix to this Description, was previously approved in the Superblock ISMS Description.

6.4.1.2 Integration work sheets are developed for appropriate work activities

- 1) The intent of the IWS is to ensure front-end identification of all hazards associated with a work activity. An IWS is required when a work activity is beyond that commonly performed by the public. The organization authorizing a work activity is responsible for ensuring that an IWS is prepared, reviewed, and approved consistent with the provisions of Section 7 and the *ES&H Manual*. The format and instructions for the IWS are contained in the *ES&H Manual*. The completed IWS provides the authorization for the work activity once a prestart review confirms readiness.
- 2) At the discretion of the authorizing organization, preparation of the IWS may be delegated to either the organization responsible for: a) supervising the work activity, or b) the facility safety envelope. Any delegation of the responsibility for preparing the IWS is to be documented as described in the *ES&H Manual*.
- 3) The organization responsible for ensuring the facility and/or operational safety envelope is to review and concur with the IWS.
- 4) For any work LLNL performs in Nevada under the purview of NSO, the NTO Resident Manager (RM) is responsible for ensuring the facility and/or operational

safety controls specific to Nevada are included. The RM is to review and concur with each IWS that governs work in Nevada.

6.4.1.3 Appropriate sections of the *ES&H Manual* are applied in the process of analyzing hazards

- 1) The specific hazards identified with the work activity are to be analyzed according to the requirements of the applicable sections of the *ES&H Manual* and by the use, as necessary, of the appropriate ES&H professionals.
- 2) The identified hazards are to be clearly communicated to all involved in the activity.
- 3) The authorizing organization and the individual supervising the work are responsible for periodically reviewing the hazards associated with the work activity as described in the *ES&H Manual*.

6.5 Hazard Mitigation and Control

6.5.1 DOE Core Function 3—Develop and Implement Hazard Controls

6.5.1.1 Uniform processes govern development of safety documents

- 1) Uniform requirements and processes are to be applied across the Laboratory for consistent and comprehensive development and completion of the safety documents cited in this Description, as well as other major safety documents by using the provisions contained in Section 7 and the *ES&H Manual*. Particular attention is to be applied in the development of the Documented Safety Analysis (DSA) and the Technical Safety Requirements (TSR) for nuclear facilities to the specific requirements provided in the *ES&H Manual*. The described requirements and processes provide the essential conditions, content, format, and other specifics for these documents. Appropriate implementation and utilization of applicable WSS are to be incorporated as described in the *ES&H Manual*.
- 2) A uniform process is to be applied across the Laboratory for the development of safety and safety-related procedures consistent with the provisions established in the *ES&H Manual*. This process identifies when procedures are to be developed, specifies content based upon the hazards being managed, and provides a recommended format for structuring the procedure.

6.5.1.2 Requirements in the *ES&H Manual* are applied in the process of developing and implementing controls

- 1) The individual supervising the work activity is responsible for ensuring that tailored controls are developed for each hazard associated with the work activity. The tailored controls including the appropriate incorporation of engineered and

administrative controls are to be developed and implemented consistent with Section 7 and the *ES&H Manual*.

- 2) As appropriate, Subject Matter Experts are to be used in development of work controls. These individuals provide advice on application of the *ES&H Manual* and applicable WSS to specific work activities, to ensure consistent implementation across LLNL.
- 3) Workers are strongly encouraged to be actively involved in the development of operating procedures specific to their work activities.
- 4) The authorizing organization is responsible for approving the work controls and ensuring that appropriate and graded use of quality assurance principles and processes as described in the *ES&H Manual*, are incorporated and used. Note that the Superblock, including the Radiography Facility (B-239), uses approved work control processes described in Section 16.
- 5) The designated controls are to be clearly communicated to all involved in the activity.
- 6) The authorizing organization and the individual supervising the work are responsible for periodically reviewing and ensuring the adequacy of the controls associated with the work activity and the effectiveness of the engineered and administrative controls incorporated.

6.5.2 DOE Guiding Principle 5—Identification of Safety Standards and Requirements

Safety standards and requirements are identified and implemented. The basis and particulars are presented in Sections 10 and 12.

6.5.2.1 Programs for preventing injuries are defined

- 1) Each directorate is responsible for having in place defined programs to prevent injuries. An ergonomics program developed consistent with the *ES&H Manual* is an example of a defined program to prevent injuries.
- 2) Each directorate is responsible for analyzing all the injuries associated with their organization's operations and facilities.
- 3) Injury and illness statistics and related information are accessible through an access-controlled database (OAASIS) maintained by HCD.
- 4) Using resources such as the Lessons Learned program, each directorate is responsible for assessing whether existing practices or conditions could materially contribute to the organization's accident and injury rates.
- 5) Each directorate is responsible for developing programs to address: a) the specific injury and illness categories driving the organization's lost and restricted work day

numbers and b) other practices or conditions that could materially affect the organization's accident and injury rates.

6.5.2.2 ISMS principles and commitments are addressed in safety documents

- 1) The *ES&H Manual* and other Laboratory safety documents are to address ISMS principles and commitments.
- 2) The *E&SH Manual* describes the approaches the Laboratory uses to implement the ISMS. The *ES&H Manual* references and implements the WSS set as they relate to specific work and hazards.
- 3) The directorate safety and safety-related documents (e.g., IWSs, FSPs, IWS/SPs, Self-assessment Plans, training plans, etc.) are written based on the ISMS principles and incorporate the applicable requirements of the WSS set, all per the provisions of this Description and the *ES&H Manual*. The IWS is not required for the Superblock activities as described in Section 16.C.

6.5.3 DOE Guiding Principle 6—Hazard Controls Tailored to Work Being Performed

Hazard controls are tailored to the project work.

6.5.3.1 Appropriate sections of the *ES&H Manual* are applied in tailoring controls to specific work activities

The individual supervising the work activity is responsible for ensuring tailored controls are developed and implemented for each hazard associated with the facility and work activity consistent with the provisions of Section 7 and the *ES&H Manual*.

6.6 Work Authorization and Execution

6.6.1 DOE Guiding Principle 7—Operations Authorization

Operations are authorized before work begins.

6.6.1.1 Work activities are appropriately reviewed and authorized before starting

- 1) Work activities are to be reviewed and authorized before the work begins consistent with the provisions of Section 7 and the *ES&H Manual*.
- 2) The Responsible Individual solicits worker review and comment of proposed operating plans or procedures before work is authorized.
- 3) The authorizing organization is responsible for ensuring an appropriate prestart review is conducted to validate satisfaction of the safety requirements.

- 4) The scope and rigor of the prestart review will vary based on the characteristics of the work activity. The requirements of the prestart review process are defined in the *ES&H Manual*.
- 5) When a person calls 911 for an emergency situation, the Emergency Management Division automatically becomes the authorizing organization for the emergency response, without any documentation (other than their Policies and Procedures), to respond to that incident. The Emergency Management Division is responsible for the safety and work practices of the response.

6.6.1.2 Authorization agreements

For B-332 and as appropriate for certain other Category 2 and 3 nuclear facilities and activities involving unusual nuclear hazards, LLNL and DOE mutually may agree to establish authorization agreements for specific facilities or activities. The purpose of the authorization agreements is to provide a definitive understanding and documentation structure that includes the Authorization Basis for the facilities or activities covered, consistent with Contract 48.

An important feature provided is that they contain the necessary specific considerations and determinations required for the particular facilities and activities and enable this Description to address the institutional aspects. The agreements provide authorization of these facilities and activities when following the processes described in the applicable ISMS Description. The agreements between DOE and the Laboratory identify, as appropriate, the hazards and associated mitigation measures required for authorization of the facilities and activities.

After a potential need for an authorization agreement has been brought to the Laboratory leadership and addressed, the cognizant AD and DOE will determine the conferring parties and the terms and conditions of an authorization agreement. To provide for proper maintenance and continued attention, each authorization agreement is to be reviewed annually and be updated and reapproved as necessary by those responsible at the Laboratory and DOE. The specific applications of authorization agreements are defined in Section 7.

6.6.2 DOE Core Function 4—Perform Work within Controls

6.6.2.1 Work is appropriately controlled

- 1) Each individual is responsible for adhering to the safety controls established for the work activity and informing their supervisors when controls are believed to be inadequate.
- 2) The Responsible Individual is responsible for ensuring that the work is performed in accordance with the defined work controls.

6.6.2.2 Applicable procedures and governing documents are followed

- 1) The individual supervising the work is responsible for ensuring that each worker has immediate access to the work activity's governing procedures and safety documents.
- 2) Steps are taken by the individual supervising the work to ensure that each worker on the activity is knowledgeable concerning the governing procedures and work controls.
- 3) All work is to be performed in conformance with applicable procedures and governing documents.

6.7 Performance Monitoring and Feedback**6.7.1 DOE Core Function 5—Provide Feedback and Continuous Improvement****6.7.1.1 Work activities are monitored**

- 1) The individual supervising the work is responsible for monitoring the work activity to ensure that the governing procedures and safety documents are being followed.
- 2) If there is indication that the proper limits and/or controls of a work activity are not being followed, the activity is to be evaluated immediately by the authorizing organization to confirm the indication. Once confirmed, the work activity shall be suspended in a controlled and safe manner, if appropriate, until remedial actions are taken.
- 3) In the event it is determined that the approved Work Activity Authorization or the Facility Operation Authorization per the provisions of Section 7 and the *ES&H Manual* is exceeded, the affected work and/or facility is to be placed in a safe condition and further work suspended until appropriate remedial actions are taken.
- 4) Each worker is responsible for bringing to the attention of their immediate supervisor problems with the applicable limits or controls and opportunities for improvement associated with the work or governing procedures. The supervisor is responsible for the evaluation and appropriate action.
- 5) Each worker is empowered to stop work if there is an unsafe or unapproved condition. Prompt notification of the immediate supervisor is required. Resumption of work will not proceed until after the condition has been evaluated and the appropriate remedial actions have been taken.

6.7.1.2 Safety self-assessment programs are defined

- 1) The purpose of the Laboratory's safety self-assessment program is to ensure a proactive approach to safety and to improve safety performance. The specific objectives of LLNL's safety self-assessment program are to ensure: a) Laboratory operations comply with applicable safety policies and procedures; b) safety-related

requirements are integrated into all levels of facility, management, and operational activities; and c) safety-related deficiencies are identified, analyzed, and managed to minimize their occurrence or recurrence.

- 2) Each directorate is to develop and operate a safety self-assessment program consistent with the requirements specified in the *ES&H Manual*.
- 3) As an integral part of the safety self-assessment process, each directorate is to perform an annual evaluation of its implementation of the LLNL ISMS. The evaluation is to include a review of the Directorate Implementation Plan and any succeeding documentation to ensure they remain workable, current, and in conformance with this Description.

6.7.1.3 Processes are in place to measure and reinforce safety requirements and expectations

- 1) Contract 48 establishes strategic performance objectives and measures as described in Section 9.2. Each performance objective and measure is assigned to a specific directorate that is responsible for providing the required information and tracking the status of performance.
- 2) The ES&H performance measures process is managed at an institutional level. The ES&H Working Group has a key advisory role in facilitating the ES&H performance measures process and integrating it into the directorates' safety performance metrics.
- 3) ES&H performance measure information is accessible to all employees.
- 4) Each directorate is responsible for having appropriate metrics to evaluate its safety performance.

6.7.1.4 Processes are defined for analyzing problems, identifying root causes, and ensuring corrective actions are taken

- 1) Each directorate is responsible for analyzing, tracking, trending, and correcting safety-related problems and deficiencies associated with its operations and facilities.
- 2) Each directorate is to record and track safety-related deficiencies consistent with the provisions and thresholds specified in the *ES&H Manual*. Each directorate is responsible for correcting deficiencies from requirements, as described in the *ES&H Manual*.
- 3) Each directorate is responsible for reporting, analyzing, tracking, and correcting safety-related occurrences consistent with the Laboratory's implementing procedure for occurrence reporting.

- 4) Serious safety-related incidents are to be formally reviewed, addressed, and reported consistent with the provisions of the *ES&H Manual*. For incidents in nuclear and radiological facilities and activities, the PAAA Office is to be involved, as appropriate.
- 5) Each directorate is to use medical surveillance examinations as appropriate to assess impacts of work on employee health.
- 6) Root cause analyses are to be performed for occurrences, formal incident analyses, and other safety-related issues the directorate deems appropriate.
- 7) Senior management will use an Issues Management System to identify, track, and resolve institutional cross-cutting issues that require senior management attention.

6.7.1.5 An annual independent assessment of LLNL's ISMS is conducted

The Assurance Review Office (ARO) is responsible for conducting an annual independent assessment of the implementation of the LLNL ISMS.

- 1) The ARO is to periodically assess continued conformance of each Directorate Implementation Plan and any succeeding documentation with this Description.
- 2) The ARO assessment is to include an evaluation of each directorate's implementation of the LLNL ISMS in accordance with the commitments and plans made in its Directorate Implementation Plan and any succeeding documentation.
- 3) The ARO will transmit the results of the directorate evaluations to the affected ADs for their information and any action that may be required.
- 4) The results of the directorate evaluations will be transmitted to the DDO.

6.7.1.6 Lessons Learned are effectively transmitted

- 1) The Laboratory's Lessons Learned Coordinator gathers information regarding potential Lessons Learned from internal and external sources based on experiences considered relevant to Laboratory operations. Potential Lessons Learned are reviewed with several ES&H organizations within the Laboratory, including members of the ES&H Working Group, before being distributed.
- 2) Lessons Learned are to be shared to enhance operational safety and facilitate cost effectiveness. Individuals are to be encouraged to submit Lessons Learned.
- 3) Lessons Learned are to be prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product.
- 4) The Lessons Learned Coordinator transmits Lessons Learned to individuals identified by each directorate's Assurance Manager. In addition, each Assurance

Manager is responsible for ensuring transmission of Lessons Learned to other appropriate personnel.

- 5) Lessons Learned will be posted on the “LLNL only” website.
- 6) The authorizing organization is responsible for ensuring that applicable Lessons Learned maintained on the “LLNL only” website are considered during the process of authorizing work.
- 7) A review of Lessons Learned maintained on the “LLNL only” website is to be incorporated into each directorate’s self-assessment program to ensure continued utilization of relevant Lessons Learned.
- 8) As described in LLNL procedures, Lessons Learned are shared with the greater DOE community through DOE’s website for Lessons Learned.

6.7.1.7 Improvements are to be incorporated into the ISMS implementing documents

Based on the information derived from the various performance monitoring and feedback processes, appropriate improvements are to be incorporated into this Description, the Directorate Implementation Plans and any succeeding documentation, and the *ES&H Manual*, as appropriate.

6.8 Conclusion

Unique issues and special cases not articulated in the set of core requirements in this Section are to be addressed by the identified management chain and taken to the responsible AD for resolution and then, as necessary, to the DDO.

7.0 Work Planning and Authorization Process

7.1 Introduction

The objective of the work planning and authorization process is to promote safe operations by ensuring that the hazards associated with facility operations and work activities are clearly understood and appropriately managed. Section 7.2 describes the Facility Operations and Authorization structure and Section 7.3 describes the Work Activities and Authorization Structure. Consistent with the graded approach process, the greater the hazards associated with a facility or activity the more rigorous the preparation and authorization process required. The Laboratory has established eight facility classifications and three work authorization levels for work activities based on specific hazards and thresholds. Work control and approval/concurrence requirements have been established to ensure safety is properly and consistently addressed.

The basic relationship and the integration between the Facility Authorization Structure and the Work Activity Authorization Structure are important. They result from how the two structures are constructed and used. A key reason for having the two structures is to fit into the ISM Institution/Facility/Activity Process and to have explicit safety processes for both. More importantly, each structure is distinct with its own hierarchy, requirements, and uses.

The facility classification is based on the hazards and is used to establish the safety envelope and types of activities that can be conducted in a facility. It defines and documents the content and particulars of activities allowed in that facility. The Work Activity Authorization Structure is based on the control of hazards and is used to define the hazards, establish the controls, and authorize an activity.

The basic functional relationship and the integration between the two is that they ensure that a planned activity is done within the safety envelope authorized for a facility and that clear lines of responsibility are maintained. Consistent with Section 7.3, facility concurrence is required in authorizing an activity to ensure the planned activity fits within the approved safety envelope and that the collective set of activities being performed in a facility do not exceed its approved safety envelope. When used in combination, the two structures provide a comprehensive and integrated approach to a formalized safety process and enable consistent application across the Laboratory.

7.2 Facility Operations and Authorization Structure

Each facility identifies and evaluates the associated hazards to determine the appropriate facility classification levels described in this section. The levels are directly connected to the types and importance of hazards in them. An FSP, approved by the Facility AD with concurrence from the ES&H Team Leader, is required for each facility

classified as low, moderate, high, accelerator, or nuclear category 2 and 3. A directorate may elect to use a single FSP to cover multiple facilities. Each of the facilities classified as above require a formal safety assessment or analysis and DOE approval. Authority for this approval may be delegated to LLNL in writing. The process for the development of safety basis documentation for nuclear facilities including a flow diagram and the necessary specifics is in the *ES&H Manual*. LLNL has no Category 1 nuclear facilities or high hazard facilities. The impacts described are to people or to the environment, or as stated. Table 7.1 summarizes the preparation and authorization process elements for facilities. Although not shown, the activity of onsite transportation of Category 2 or 3 quantities of nuclear materials also requires safety analysis and prestart reviews. This will be done using the same authorization structure as Nuclear Category 2 or 3 facilities depending on the quantity of authorized material. The hazard analysis mechanism is identified for each level in the form of the document or action required to perform the function. The *ES&H Manual* contains necessary specifics for the prestart reviews at each level as well as other information, definitions, and elaboration.

Office: Office facilities are workplaces for managerial, administrative, professional, and technical staff. The primary work that takes place in an office facility is the preparation, reading, communication, and storage of documents and data and the interaction between personnel through meetings, telephone conversations, and e-mail. Extensive use of office-related equipment is expected in office facilities. Facility management shall verify that facilities classified as Office meet established criteria. Safety basis documentation is not required for office facilities.

Light Science and Industry (LSI): Facilities classified as Light Science and Industry have the potential for unmitigated release of hazards with impacts to co-located workers that are believed to cause no more than mild, transient adverse health effects or the perception of an objectionable odor or sensation for nearly all individuals. Impacts to the public are believed to present no appreciable risk of health effects for nearly all individuals. The Facility Screening Report identifies facility level hazards and controls and represents the facility-specific safety document for this classification. Authorization to start a new facility classified as Light Science and Industry is by facility acceptance.

Low: Facilities classified as Low have the potential for unmitigated release of hazards with impacts to co-located workers that are believed to include no irreversible or other serious health effects or symptoms that could impair their abilities to take protective action for nearly all individuals. Impacts to the public are believed to be no more than mild, transient adverse health effects or the perception of an objectionable odor or sensation for nearly all individuals. Formal safety basis documentation is required for all hazards above LSI. The controls in the FSP are to be adequate to ensure the safety envelope and to ensure compatibility of work activities conducted within the facility. A prestart review is required prior to the operation of any new Low hazard facility.

Table 7.1: Facility Authorization Structure.

Facility Classification	Hazard Analysis Mechanism	Controlling Documentation (a)	Safety Basis		Type of Prestart Review
			Approval		
Office	Office Criteria/Walkthrough	<i>ES&H Manual</i>	FM or FPOC		Facility Acceptance
Light Science and Industry	Facility Screening Report	Facility Screening Report and <i>ES&H Manual</i>	Facility AD (b) or NNSA/LSO (c)		Facility Acceptance
Low	Formal Safety Basis Document (SBD)	SBD and Facility Safety Plan (FSP)	Facility AD or NNSA/LSO (c)		Prestart Review
Accelerator	Formal Safety Assessment	Safety Assessment Document (SAD) and FSP	Facility AD and NNSA/LSO		Accelerator Readiness Assessment
Moderate	Formal SBD	SBD and FSP	Facility AD or NNSA/LSO (c)		Readiness Assessment
High	Formal SBD	SBD and FSP	Facility AD or NNSA/LSO (c)		Readiness Assessment
Nuclear Hazard Category 3	Formal Safety Analysis	Document Safety Analysis (DSA), TSRs, and FSP	Facility AD and NNSA/LSO (d)		Operational Readiness Review (ORR) (e)
Nuclear Hazard Category 2	Formal Safety Analysis	DSA, TSRs, Authorization Agreement (f), and FSP	Facility AD and NNSA/LSO (d)		ORR (e)

- Notes
- (a) FSP approval is by the Facility AD with concurrence of the ES&H Team Leader.
 - (b) Or designee.
 - (c) When NNSA/LSO delegates risk acceptance authority to LLNL, their approval is not required.
 - (d) Or DOE Program secretarial office.
 - (e) A restart is done as described in the *ES&H Manual*.
 - (f) As required.

Accelerators: For facilities having accelerators capable of 10 MeV or greater, an accelerator-specific Safety Assessment Document (SAD) is prepared in addition to an FSP. The SAD is concurred upon by the HCD head and approved by the Facility AD and NNSA/LSO. The SAD establishes the agreed-upon safety envelope for the accelerator facility within which the safety procedures must fit. The controls defined in the facility's governing documents are to be adequate to ensure the safety envelope and compatibility of the work activities conducted under the auspices of the SAD. An Accelerator Readiness Assessment is required prior to the operation of any new accelerator facility.

Moderate: Facilities classified as Moderate have the potential for unmitigated release of hazards with impacts to co-located workers that are believed to include no life-threatening health effects for nearly all individuals. Impacts to the public are believed to include no irreversible or other serious health effects or symptoms that could impair their abilities to take protective action for nearly all individuals. In addition to an FSP, a facility-specific safety basis document is prepared, and approved by the Facility AD (or designee). The safety basis document establishes the agreed-upon safety envelope within which the FSP and any safety plans must fit. The controls defined in the facility's governing documents are to be adequate to ensure the facility safety envelope and compatibility of work activities conducted under the auspices of the safety basis document. A Readiness Assessment is required prior to the operation of any new facility as moderate.

High: Facilities classified as High have the potential for unmitigated release of hazards with impacts to co-located workers that are believed to include life-threatening health effects and whose impacts to the public are believed to include irreversible or other serious health effects, symptoms that could impair their abilities to take protective action, or possible life-threatening health effects. In addition to an FSP, a facility-specific safety basis document is prepared, and approved by the Facility AD (or designee). The safety basis document establishes the agreed-upon safety envelope within which the FSP and any safety plans must fit. The controls defined in the facility's governing documents are to be adequate to ensure the facility safety envelope and compatibility of work activities conducted under the auspices of the safety basis document. An Operational Readiness Review is required prior to the operation of any new facility classified as High.

Category 3 Nuclear: Nuclear facilities are categorized according to the requirements of DOE-STD-1027-92, based on radioactive material inventory and radiological activities. Each Category 3 nuclear facility requires the preparation of a DSA and TSRs in addition to the FSP. The DSA and TSRs establish the agreed-upon safety envelope within which the FSP and any OSPs must fit. These documents define sufficient processes, controls, and limits to ensure that the facility is operated safely and in conformance with all applicable requirements. With institutional concurrence from the DDO, the Facility AD and NNSA/LSO approve the DSA and TSRs. An Operational Readiness Review is

required prior to the operation of any new Category 3 nuclear facility and restarts are done as described in the *ES&H Manual*.

Category 2 Nuclear: Nuclear facilities are categorized according to the requirements of DOE-STD-1027-92, based on radioactive material inventory and radiological activities.

A Category 2 nuclear facility requires the preparation of a DSA, TSRs, and an authorization agreement in addition to the FSP. The DSA, TSRs, and authorization agreement establish the agreed-upon safety envelope within which the FSP and any OSPs must fit. These documents define sufficient processes, controls, and limits to ensure that the facility is operated safely and in conformance with all applicable requirements. With the concurrence of the DDO, the Facility AD and NNSA/LSO approve the DSA, TSRs, and authorization agreement. An Operational Readiness Review is required prior to the operation of any new Category 2 nuclear facility and restarts are done as described in the *ES&H Manual*.

In no instance may an FSP or IWS/SP extend operations beyond those authorized by a DSA, Safety Basis Document, or SAD. Such cases require that the revision or change control process for the Safety Basis Document, DSA, or SAD be followed. Depending on the facility classification, the revision process starts with the preparation of an Unreviewed Safety Issue (USI), Change Control Form, or Unreviewed Safety Question (USQ).

In this structure, the use of authorization agreements is being done consistent with NNSA guidance (Ref. 5). Authorization agreements may constructively serve in applications to certain facilities or activities, as described in Section 6.6.1.2. In situations where authorization agreements are determined to be necessary, the process established for each one will address the required particulars and documentation.

7.3 Work Activities and Authorization Structure

All work activities shall include attention to safety and use of the ISMS in order to address and improve the overall safety performance at LLNL. This can be accomplished by using the Work Activity Authorization Structure and Levels described in this section. The structure and levels are connected to the hazards through the degree of understanding of the hazards and controls and the documentation that exists or is required for work activity authorization. This approach provides a single process for addressing the variety of hazards at LLNL. In each level, there is a range of hazards that are addressed by the type of controls and documentation cited. Appropriately incorporated are the facility requirements as provided by the FSP, where applicable, and the FPOC. When a work activity is beyond those commonly performed by the public, preparation of an IWS is required (Work Authorization Level B and above) as described in Section 6.4.1.2. For the Superblock activities, the function of the IWS is served by a separate work control process with documentation of equivalent intent and content as determined and maintained by the responsible directorate; thus, the IWS is not required

for these. (See Section 16, Appendix.) The IWS process is designed to ensure front-end identification and understanding of an activity's hazards and to facilitate the development and implementation of tailored controls. A single IWS may be used to cover multiple activities of a similar nature. The IWS ensures a conscious formal process where there is no self-authorization. Project participants and, as appropriate, ES&H professionals and Subject Matter Experts are involved in the preparation and authorization process to help ensure attainment of the ISM objectives.

For certain situations, work permits are necessary as described in the *ES&H Manual*. Table 7.2 summarizes the preparation and authorization process elements for work activities. The hazard analysis mechanism is identified for each level in the form of the people required to perform the function. The *ES&H Manual* contains necessary specifics for the prestart reviews at each level as well as other information, definitions, and elaboration.

Work Authorization Level A: *Commonly performed by the public.* Such work activities are designated as Level A. They may proceed at the Responsible Individual's discretion in accordance with generally accepted practices and applicable LLNL safety requirements. Because the work is self-authorized, the worker is the Responsible Individual. No activity-specific documentation is required. The Responsible Individual's supervisor is responsible for being cognizant of the Responsible Individual's assignments.

Work Authorization Level B: *Standard controls with review.* Work activities just beyond those commonly performed by the public and governed by existing safety documents are designated as Level B. Such activities require an IWS, whether the work is conducted onsite or offsite, to ensure proper planning, authorization, and documentation. Appropriate work controls are defined by references to the *ES&H Manual* and other applicable existing ES&H documents, again as applicable. Required approval is by the identified Authorizing Individual, with concurrence of the FPOC and the ES&H Team Leader (or designee) upon confirmation of controls.

Work Authorization Level C: *Supplemental controls.* An IWS/SP is prepared when: a) required by provisions of the *ES&H Manual*; or b) mandated by management. This is required whether the work is conducted onsite or offsite if LLNL has management responsibility. Approval is by the Authorizing Individual with concurrence of the FPOC and the ES&H Team Leader. A prestart review is required.

Table 7.2: Work Activity Authorization Structure.

Work Authorization Level	Work Activity Category	Hazard Analysis Mechanism	Controlling Documentation	Work Activity Authorization			
				Approval	Concurrence	Type of Prestart Review	
A	Commonly performed by the public	Responsible Individual (RI)	<i>ES&H Manual</i>	Responsible Individual (RI)	Supervisor (implied)	Informal confirmation of controls (undocumented)	
B	Not commonly performed by the public, IWS preparation required	Standard controls with review	RI, Facility Point of Contact (FPOC), and ES&H Team (a)	IWS (b)	Authorizing Individual	FPOC and ES&H Team Leader (c)	Confirmation of controls
C		Supplemental controls in a Safety Plan	RI, FPOC, and ES&H Team	IWS/SP	Authorizing Individual	FPOC and ES&H Team Leader	Prestart Review

- Notes (a) Provides support as necessary.
 (b) References *ES&H Manual* and other applicable existing safety documents (e.g., Engineering Safety Notes, Permits, etc.), as appropriate.
 (c) ES&H Team Leader or other ES&H reviewer designated by the ES&H Team Leader.

Laboratory operations are designed to comply with Contract 48 requirements; LLNL internal policies, procedures, and standards; federal, state, and local regulations; and other WSS. However, there may be occasions when a specific work activity or facility requires a deviation from these established requirements. In those cases, organizations must request and obtain written authority to deviate from the requirements. This is called an exemption.

The WSS Change Control Board (CCB) follows established written procedures when reviewing and approving all exemption requests to requirements contained in the non-regulatory LLNL WSS set listed in Appendix G of Contract 48 (i.e., those in WSS List B). If the CCB and the DOE Contract Approving Official approve the exemption request, the activity shall follow the required Work Authorization Level A, B, or C above as appropriate.

An exemption from an internal LLNL requirement that is not part of Contract 48 (i.e., a requirement specified in the *ES&H Manual* that is not required by an outside source) does not require CCB approval, but the exemption from LLNL requirements must be explicit in the Work Authorization Level (WAL) B or C documentation. This is to ensure that reviewers and approvers are cognizant of the exercised exemption.

8.0 Integration

8.1 Introduction

Integration of program and safety planning, from the Director down to the individual workers, is accomplished following the Institution/Facility/Activity Process using this Description and the Directorate Implementation Plans. Basic to the integration and the operations at the Laboratory is the *ES&H Manual* and the incorporation of the ISMS fundamentals into it.

Worker involvement is an essential part of ISM; therefore, an important integration direction is the formalized upward involvement and connection from the workers in all of the functions and assignments. This integration needs to be operative upward through the institutional, facility, and activity processes as well as from the top down as mainly contained in this Description. The Laboratory and the directorates must encourage, use, and recognize the suggestions, ideas, and efforts from the workers. Similarly, because of the LLNL mixed matrix organizational structure, integrations across directorates and their program, payroll, facility, and services operational functions must also be addressed. These are addressed from the institutional perspective in this Description. The necessary specifics for all directions of integration are contained in the Directorate Implementation Plans or succeeding documents. The important management chains are also addressed in this section.

To help facilitate the incorporation of ISMS at LLNL and in recognition of the increased formalization, the existing ES&H documents were organized into a formal structure and put under configuration control. This consolidation is called the *ES&H Manual* and is comprised of six volumes. In support of this document structure is a set of Controlling Principles for the *ES&H Manual* that provides the basic requirements for the use, maintenance, and availability of the *ES&H Manual*.

Communications and training are critical components of ISMS integration at LLNL. These need to be done at the institutional and directorate levels and reach all in the LLNL workforce. They have been started and will continue in an organized, structured process as the ISM implementation proceeds.

8.2 Directorate Implementation Plans

To establish the flow down of ISMS requirements from institutional requirements to the working level, each directorate has an ISMS Implementation Plan, established directorate plans, or documents that succeed the Implementation Plan that satisfy the requirements specified in this Description. Separate Directorate Implementation Plans are appropriate because each directorate has unique programmatic missions with different types of facilities, technical work, and hazards.

Directorate Implementation Plans or succeeding documents shall reference specific implementing provisions for each of the core requirements established in this Description. When uniform practices are mandated, each directorate references the specified implementing provisions. Directorate Implementation Plans define the organization's document hierarchy and the safety roles, responsibilities, and authorities for each position-level within the organization. Initial Directorate Implementation Plans are subject to institutional review to assure that the requirements established in this Description are satisfied. The Directorate Implementation Plan may be the chosen continuing operating document or it may be the transition document and so appropriate succeeding documentation may be necessary. This is specifically noted or added in particular sections for completeness and emphasis.

Each Directorate Implementation Plan starts with the following standardized statements to express the recognition, understanding, and acceptance of ISMS, along with a commitment to ISMS and the LLNL ISMS Description for all of the operations and activities in their directorate.

- 1) The directorate recognizes and understands the DOE/UC contract requirement for ISMS at LLNL and the opportunities and values of it.
- 2) The directorate accepts the DOE ISM Objective, Guiding Principles, and Core Functions and the institutional requirements contained in the LLNL ISMS Description.
- 3) The directorate is committed to implementing and utilizing ISMS in all of its programs, operations, facilities, and activities and to continue its use.

The Directorate Implementation Plans or succeeding documents are the means by which the LLNL mixed matrix organizational structure is able to describe their particular organizational structures, operations, facilities, and activities, and the hazards involved and how they address the safety aspects of these in the context of Contract 48 and ISMS. They provide the necessary self-determination and focus for the individual responsibilities involved. These plans address the particular standards used for the special hazards in their directorates.

Critical considerations in these plans are the "tailoring commensurate with the hazards" so it can be shown that the many Contract 48 and ISMS requirements are met. They also address the necessary major delegation/acceptance agreements that are necessary for the program and the applicable payroll, facility, and services support parts of each directorate. Another facet of flowdown contained in the directorate implementing documentation is the demonstration of the connections into the institutional documents and the continued recognition and utilization of them. For this, the requirements matrix connecting the core requirements in the description to the

ES&H Manual and into the directorate documentation has continuing value and should be maintained in any succeeding documentation.

The responsible AD signs the Directorate Implementation Plan. The initial implementation plans underwent a formal institutional review and approval process to assure compliance, completeness, and consistency with the details in Contract 48 and the LLNL ISMS Description.

For substantive changes or responding to a new version of this Description, the Directorate Implementation Plans or any succeeding documentation are to be realigned accordingly through an update or by using crosswalks or other appropriate mechanisms. Each AD is responsible for the maintenance and configuration control of his or her directorate's ISMS implementation documents.

8.3 ES&H Manual

In the increased formalization being brought about by the incorporation of ISM, there is considerable value in collecting and organizing the ES&H documents into a formal structure and put it under configuration control. This has been done by establishing an ES&H document structure called the *ES&H Manual*. Included in this new manual are the contents of the former principal ES&H document at LLNL, the *Health and Safety Manual*. This long established and maintained document applied across the Laboratory to all operations and activities. It was structured to address all of the topics needed at the Laboratory and was attentive to federal regulations, DOE orders, and the current technical capabilities. Also included are the contents of the former second principal ES&H document at LLNL, the *Environmental Compliance Manual*, which addressed federal, state, and local governmental regulations. Accompanying these in the *ES&H Manual* are specialty manuals such as the *Training Program Manual* and the Quality Assurance Program. To accomplish the purpose of the *ES&H Manual* to have the necessary ES&H documents for LLNL activities in one structure, criteria for the specific inclusion or exclusion of candidate ES&H documents is to be included in the *ES&H Manual* itself.

The requirements in the *ES&H Manual* are based on the WSS set identified for the specific work and associated hazards (see Section 10 for the description of the WSS set) and LLNL best practices that have been determined to be requirements. The *ES&H Manual* also describes the implementation of the ES&H management commitments made in this Description.

The *ES&H Manual* consists of six volumes. In these:

Volume I, ES&H Management, contains Chapter 1 (“Laboratory and ES&H Policies, General Worker Responsibilities, and Integrated Safety Management”) and Chapter 2 (“Managing ES&H for LLNL Work”) from the *Health and Safety Manual*.

The first of these two chapters describes the general responsibilities of LLNL management and workers, subcontractors, and federal and local agencies with regard to work conducted at the Laboratory. The second describes how work is to be performed based on the LLNL ISMS.

Volume II, Health and Safety—Hazards and Controls, contains the majority of the chapters and supplements that previously made up the *Health and Safety Manual*. The others have been moved to other volumes where they more logically fit within the new organization of the manual. Volume II contains both general and specific requirements for Laboratory work activities including specific responsibilities for those work activities.

Volume III, Environment—Hazards and Controls, contains documents with controls designed to protect the environment and includes a majority of the *Environmental Compliance Manual* and its guidance documents.

Volume IV, Other Institutional ES&H Documents, contains LLNL ES&H-related documents such as the Quality Assurance Program, the *Training Program Manual*, Occupational Medical Program, and Environment, Safety, & Health Education.

Volume V, Nuclear Facility Requirements, contains documents specific to nuclear facilities and related activities, including several chapters and supplements from the *Health & Safety Manual*.

Volume VI, Nevada Requirements, contains documents providing for the special LLNL activities in the NNSA/NSO operations at NTS and elsewhere.

Additional volumes may be added to the *ES&H Manual* to provide for specific activities, as was done in Volumes V and VI. The generation of such a new volume shall be done to the Controlling Principles for the *ES&H Manual* presented below.

The Controlling Principles for the *ES&H Manual* that follow provide the basic requirements for the use, maintenance, and availability of the *ES&H Manual*.

- LLNL works according to the *ES&H Manual* that either contains specific requirements or points to more specific documents and standards containing the requirements applicable at LLNL. The *ES&H Manual* is the responsibility of the DDO.
- The SEP AD develops and maintains the *ES&H Manual* through the Subject Matter Experts and DDO-appointed committees such as the ES&H Working Group, the Training Program Committee, and the Packaging and Transportation Safety Committee. It is approved by the DDO. A check and balance system exists where items disapproved in the process can be taken to the SEP AD and then to the DDO.

- The use of the *ES&H Manual* is supplemented by Subject Matter Experts and the ES&H Teams, who assist in the interpretation and implementation of the applicable requirements. The SEP AD is responsible for maintaining both the Subject Matter Experts and the ES&H Teams for all of the broadly applicable topics.
- The ADs are responsible for ensuring Subject Matter Experts are available for any hazards unique to their operations. Similarly, they provide the specialty manuals for their unique operations and activities, like the *Fire Protection Program Manual*.
- LLNL will update the *ES&H Manual* on an on-going basis through the Subject Matter Experts and the DDO appointed committees to ensure incorporation of requirements in the WSS set in Contract 48.
- LLNL addresses the technical accuracy, efficacy, and completeness of the *ES&H Manual* on a continuing basis. The review schedule for the *ES&H Manual* is developed and maintained by the Document Manager with inputs from the Subject Matter Experts and DDO appointed committees.
- The electronic copy of the *ES&H Manual*, available through LLNL website, is considered the official copy. All users are required to ensure they are working from the official copy. In addition, hardcopy sets of the *ES&H Manual* can be printed from the website and are available for reference in the LLNL Library to all managers, supervisors, and workers.
- LLNL collects, considers, and acts on ES&H Lessons Learned. The ES&H Working Group coordinates this effort with the LLNL Lessons Learned Coordinator and addresses Lessons Learned that can be used to improve the *ES&H Manual*.
- Any exceptions to the requirements in the WSS set will be addressed in a formal and conscious process commensurate with the hazards involved, as described in the *ES&H Manual*, with any resulting fundamental changes addressed accordingly in the *ES&H Manual*.
- The Document Manager maintains the *ES&H Manual* under a configuration management process to ensure that control is maintained during the development, revision, and communication of requirements from the WSS set to the end users.

With these basic requirements, the SEP AD, the Subject Matter Experts, and the DDO appointed committees will continue to conduct the necessary multi-faceted and detailed process to incorporate ISM and the WSS set into the *ES&H Manual*. The incorporation process used for the WSS set is described in Section 12, “Flow Down of Requirements.”

8.4 Management Chain

The important management chain for each work activity, from the worker and the first level supervisor up through the responsible AD or equivalent, is defined in Section 6.2.3.2. Included there is a description and a basic framework of the operational functions, which provide an extension and clarification of the overall structure for the LLNL mixed matrix organization. With these, a management chain exists for all LLNL operations so that the ES&H responsibility accompanies the funding. During the initial development of the description, the nominal and special case scenarios were demonstrated and these were tested and refined into operational cases as the Directorate Implementation Plans were prepared and reviewed.

To assist in understanding the way a management chain operates at LLNL, four operational cases are presented. They are described here as the Direct Program, Matrixed Employees, Delegated Program, and Multiprogram and Institutional Services Operational Cases. These are presented in Figures 8.1 through 8.4, with each management chain shown on the basic framework accompanied by the pertinent explanation points. These represent the most common operational cases. Representative position titles are shown and different directorates might use different ones in their organizational structures. The Facility Operational Case is essentially the same as the Multiprogram and Institutional Services Operational Case.

In addition to the program management line, the payroll and the facility lines have their own respective administrative, vocational, and facility functions and responsibilities. The reason for these is that all LLNL employees are in a payroll organization, work in a facility or equivalent, and have to be funded by the programs. The basic framework helps identify and distinguish the different roles. The ADs each have multiple operational functions, so there are many activities where the program, payroll, and facility roles are combined in the same AD and many where they are not. The services line is also necessary and yet involved in different ways with some programs having heavy use and others only occasional use depending on their needs. Services provide resource and efficiency opportunities for the directorates and Laboratory and can include user facilities and similar situations. These are all shown in more detail in Figures 8.1 through 8.4.

8.5 Integration Across the Laboratory

Another important element of safety integration is the horizontal integration across the directorates and the organizations within them. Horizontal integration is especially critical in achieving consistency in the implementation and use of ISM in all of the LLNL activities. It is also useful in the relationships with the other DOE organizations and particularly where they are working together, such as at NTS.

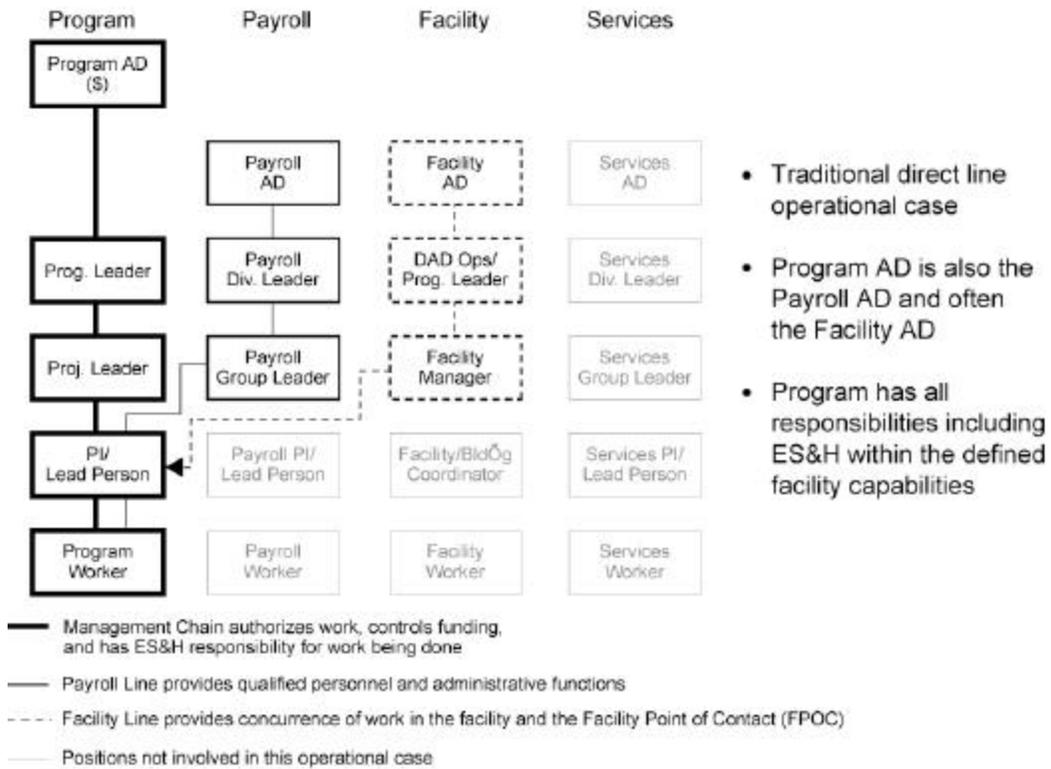


Figure 8.1 Direct Program Operational Case.

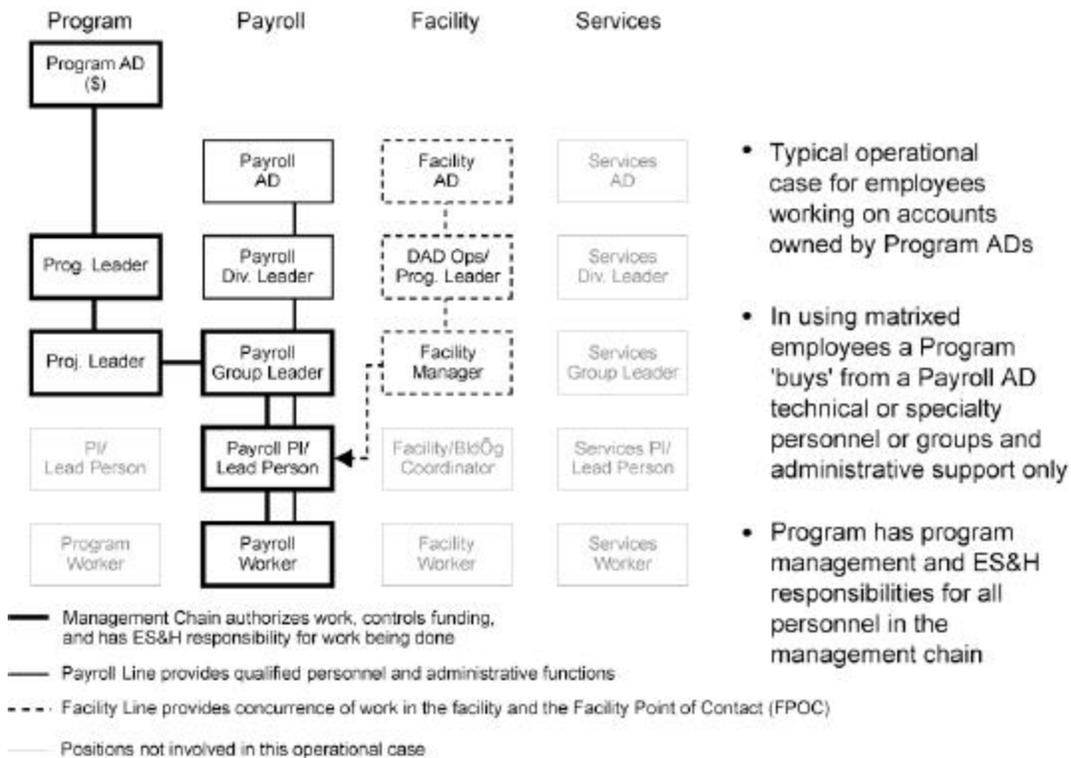
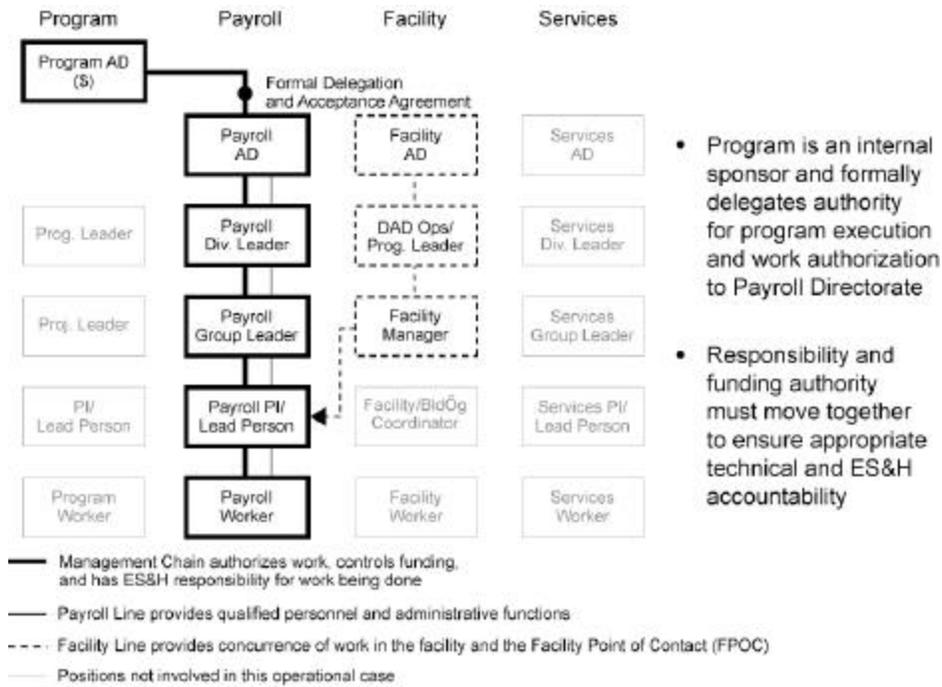
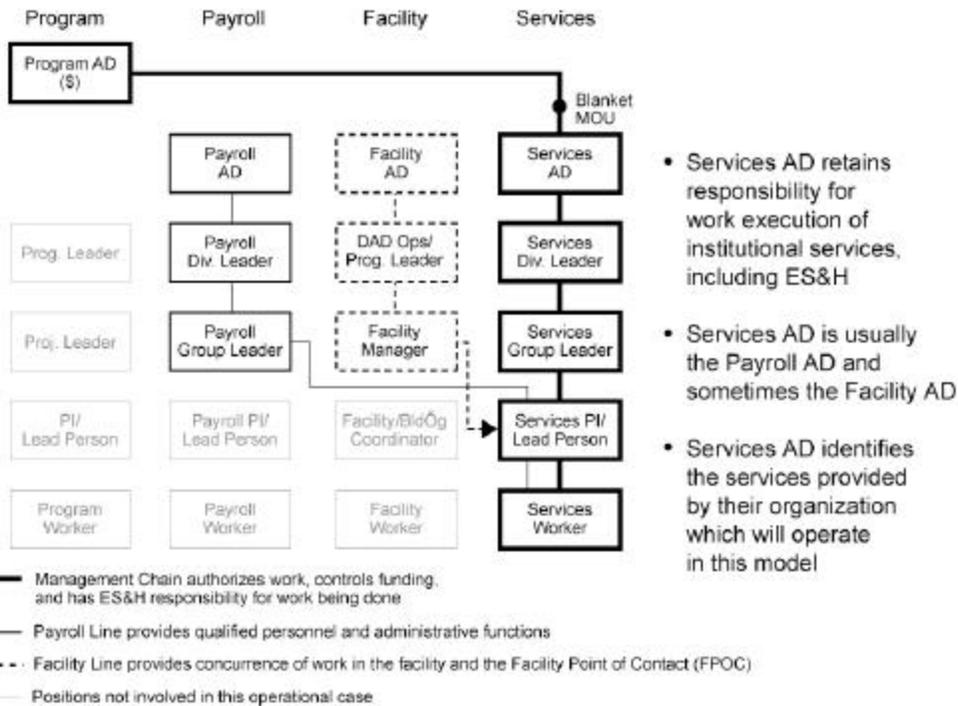


Figure 8.2 Matrixed Employees Operational Case.



- Program is an internal sponsor and formally delegates authority for program execution and work authorization to Payroll Directorate
- Responsibility and funding authority must move together to ensure appropriate technical and ES&H accountability

Figure 8.3 Delegated Program Operational Case.



- Services AD retains responsibility for work execution of institutional services, including ES&H
- Services AD is usually the Payroll AD and sometimes the Facility AD
- Services AD identifies the services provided by their organization which will operate in this model

Figure 8.4 Multiprogram and Institutional Services Operational Case.

Horizontal integration operates within many mechanisms at LLNL. The process starts with the Director, the Deputy Directors, and the ADs, and is achieved at their meetings and in their interactions together and individually. Next is the Senior Management Council (SMC), which includes the Director, Deputies, and ADs and other top management individuals with broad institutional responsibilities. Most of the ISMS development status and implementation actions have been brought first to the SMC for their information, comment, and action.

The DDO appointed committees—especially the ES&H Working Group and the Strategic Operations Council—provide the critical function of horizontal integration. The established processes for these committees are particularly valuable in addressing the institution-wide issues, actions, and needs. The electronic communications and interactions provide further value.

This Description, and in particular, the *ES&H Manual* and other ES&H documents, are major factors in horizontal integration. The availability of these on the LLNL website as well as the growing number of computer aids for filling out forms, making evaluations, and reporting greatly increases the horizontal integration and the attendant values. Other entities across the Laboratory that contribute to horizontal integration include the ES&H Team Leaders and Deputies and their meetings and interactions, the P&M connections with the TRRs, and structures within directorates like Engineering and Chemistry & Materials Science that provide support to many parts of the Laboratory. The regular meetings of the senior managers are commonly used for the ES&H topics and are important in the horizontal integration.

Horizontal integration is greatly assisted by the communications and training addressed in the next section. The Laboratory-wide communications program and the institutional training courses help ensure the ISM messages are consistent and clear.

8.6 Communications and Training

ISM communications has the long-term goal of helping to change the Laboratory's safety culture. The strategy behind long-term communications and training is to position the concept of "workplace safety" alongside those of "technical excellence" and "quality work" in everyday Laboratory life. This is being done by placing the subject of safety and key safety messages in front of employees frequently, using a variety of media, making sure employees have appropriate training, and by involving employees in identifying and solving safety problems.

Safety communications, including training, will be a continuing effort at LLNL although tone and emphasis on specific topics will change depending on current issues, employee input, and program actions. Integral to the program will be management leadership, personalized messages, continuity of effort, consistency of

discussion, and capitalization of employee values, such as people's pride in the organization, their loyalty, and dedication to excellent work.

The steady flow of communications is designed to keep from overwhelming employees with too many safety and related messages at once. The sustained effort will create the expectation that safety is part of everyday work discussions. These discussions will be enlivened by new topics presented periodically and revisiting others as needed.

Many different communication tools and approaches are being used to engage employees at all levels. Planning includes campaigns to promote awareness of specific concerns such as eye protection, expanded development and communication of Lessons Learned, promotion of the online *ES&H Manual*, communications guidance for supervisors, computer-based information sources, and special events. Feedback mechanisms will be used to identify problems and successes as ISM continues to mature.

The application of a set of best practices is providing the framework for future communications. The best practices were derived from a laboratory study of industrial and scientific sites known for good safety records, from laboratory-led focus groups, and from experiences of various employees and managers. The best practices include the following: repetition of message; promotion of off-the-job safety; participation of senior management; continuous training; and employee involvement.

Repetition of message: The objective here is to keep the subject of "safety" at the top of the LLNL agenda. A key element is maintaining employee awareness of ES&H issues using a variety of media. Communications begins with expectations being stated and discussed at senior management meetings, and other management communication opportunities, and encouraging the practice to cascade through all organizations. Newslines, NewsOnLine, and the ES&H website have an important role in the awareness effort. They regularly cover topics such as ISM successes, Lessons Learned, updates on the LLNL safety record, safety awards, and programs to hold employees accountable for following ES&H requirements. Other activities include the following:

- Periodic focus groups to allow management to hear directly from employees about ISM issues, and to demonstrate sustained management interest in the maturing and continual improvement of the ISM processes.
- Programs of monthly topical communications regarding both work-related and off-hours safety concerns. Communications planned on work-related topics include slips, trips and falls, safe handling of poisonous materials, electrical safety, building safety, and ergonomics.
- Development of resources to improve safety communications between first-line supervisors and employees. This includes specialized training, and web-based and printed information.

Promotion of off-the-job safety: Excellent safety programs around the country promote off-hour safety as well as safety while working. The Laboratory will emphasize off-job safety during many of its monthly promotions. This includes issues such as poison prevention, bicycle safety, preventing sports injuries, safe driving, fire safety, and special precautions to be taken during the winter and holiday season.

A variety of media is used to promote off-the-job safety. These include posters, instructional fliers, videos, signs and banners, and activities such as demonstrations, speakers, and an annual Safety Fair.

Participation of senior management: The vigorous participation of senior management is key to the success of safety communications programs. Experiences at other sites, plus comments made by Laboratory employees, underscore this. Examples of management activities that are conducted are walk-around programs, writing Director's Office columns for Newslines, and having ADs sponsor directorate-led ES&H promotions. Another important element is educating managers to the proper use of LLNL's case management program. Vocal management endorsement of ES&H efforts plus ongoing visibility regarding ES&H issues are important ingredients of this "best practice."

Continuous training: Relevant training for employees at large has been incorporated into the existing training structure. This will assure that new employees receive ISM training and that those moving from one directorate to another will receive specific training as appropriate. In addition, proper use of the IWS and timely updating of employee LTRAIN questionnaires assure employees receive training needed for specific work assignments.

Reviewing the training needs of specific segments of the employee population is another important on-going activity.

New curriculums are being used as they are developed and approved.

Employee involvement: This aspect of the program involves encouraging employees to participate in identifying safety problems and developing solutions, rather than management attempting this on its own. Examples of activities being used to encourage participation include use of focus groups, development of grassroots teams, awards, and suggestion programs. It should also be noted that the Annual Safety Fair is made possible through the volunteer efforts of employees.

Focus groups have been used throughout ISM implementation and have provided valuable information at the institutional and directorate levels. They will continue to provide a channel from employee to management. Another important employee involvement program involves development of grassroots teams. Numerous teams are active at the Laboratory, and two grassroots forums are held periodically to help keep

the teams fresh and start others. Other efforts that foster employee participation are suggestion and awards programs (see Section 6.2.1.1, Accountability), directorate-level activities including feedback programs, and local newsletters and web pages.

9.0 Program and Budget Execution Guidance

9.1 Internal Process

Laboratory management is responsible for planning work and for ensuring that ISMS requirements for safe work are incorporated into all activities and addressed in the prioritization and allocation of resources. ES&H is a primary consideration in planning and executing all work activities. There are five primary ways ES&H and related functions are funded at LLNL:

- 1) General and Administrative (G&A) for institutional activities.
- 2) “Other” distributed (per unit) charges including organizational facility charges.
- 3) Service centers that are institutionally approved and recharged to users.
- 4) Direct programmatic funds.
- 5) Capital projects including line item, general plant projects, and capital equipment.

The cognizant institutional support organizations annually prepares G&A budget requests for institutional ES&H functions. These requests cover institutional ES&H activities such as radiation exposure dosimetry, ES&H standards and policies, monitoring, and site-wide environmental permitting. A risk-based prioritization model is used by the ES&H organizations in SEP (HCD, EPD, and HSD) to aid in prioritization. The department heads review the prioritized activities with their respective management teams and then present them to the SEP AD. After review of all of the SEP budgets, adjustments are made to balance the impacts. Then the budgets meeting target guidance are submitted to the Budget Office. Funds for activities unable to be accommodated within target budgets are directly requested from the DDO. All proposed budgets and increments are presented to and reviewed by the DDO.

“Other” distributed charges include organizational personnel charge (OPC) for personnel management costs, program management charge (PMC) for program management costs, and organizational facility charge (OFC) for facility management costs. The OFC budgets include ES&H costs related to operation of the facility. Costs are distributed to users based on square footage occupied. Facility management usually develops the budget, which typically includes ES&H costs such as Assurance Manager costs and ES&H team support. The budgets are prepared annually and reviewed and approved by the responsible AD.

Service centers are established where direct funding is not practical and activities can be charged to users based on usage or other measure. Institutional service center examples include site maintenance costs distributed through the laboratory facility charge and procurement costs distributed through the material procurement charge. The

institutional service center budgets are reviewed in a manner similar to G&A. ADs are responsible for the general and financial management of service centers in their areas.

In the direct program area, management, from the Director down, is responsible for establishing the priorities of the work. ADs delegate ES&H authority to managers in their organization; however, the ADs remain accountable to the Laboratory Director for ensuring that ES&H activities are performed according to LLNL requirements. SEP provides the necessary ES&H and QA expertise, guidance, and services to assist ADs and their management chains in meeting ES&H requirements.

ES&H impacts are considered when prioritizing capital needs including line item projects, general plant projects, and capital equipment. Line item projects are proposed by directorates and scored by AD Facility Managers in four major areas including health and safety, environmental and waste management, safeguards and security, and mission and investment. The Council on National Security reviews NNSA/Defense Program (DP)-funded projects, which include institutional projects, before submittal to NNSA.

The budget formulation process for NNSA/DP-funded general plant projects (GPP) explicitly considers ES&H needs when recommending GPP for review and approval by NNSA/LSO. Directorates rank their projects, balancing ES&H considerations with other needs. The LLNL GPP Funding Review Committee has representatives from the Hazards Control and Environmental Protection Departments to ensure that ES&H considerations receive appropriate level of attention, review, and prioritization.

The Laboratory prioritizes institutional general purpose equipment requirements for ES&H needs with other requests for capital equipment throughout LLNL. Submittals are required to identify any ES&H impacts. Directorates prioritize their requests for review by senior management before final funding allocations are made.

One summary of the results of the annual budget request process is contained in an annual update of the Environmental, Safety, and Health Management Plan (Ref. 11) that LLNL prepares and submits to DOE. It is a five-year planning document that provides a descriptive summary of the current ES&H approach, actions, concerns, and funding assumptions as well as cost projections for major activity categories and for each identified activity. These cost projections are those associated with managing risks and achieving ES&H expectations. Included are operating, capital equipment, general plant, and construction line item cost projections for core, planned compliance, and improvement activities. To provide a complete perspective, the activities in both G&A and direct budget categories are addressed individually and together. The projections start with the current fiscal year status, address the plans for the next fiscal year, and provide the projections for the five fiscal years beyond.

9.2 Performance Objectives and Performance Measures

Objective standards of performance were first formally included in Appendix F of Contract 48 in November 1992. The present-day hierarchy of performance objectives and performance measures (POPMS) was developed in FY03.

Contract 48, Appendix F includes performance objectives and measures that constitute the basis for the contractual performance appraisal. The set of objectives have been set by a top-down process, thereby establishing strategic direction and priorities by the senior executives at NNSA, the University of California, and Los Alamos and Lawrence Livermore National Laboratories. One performance objective and its supporting performance measures encompass the area of environmental protections, safety, and health.

A separate document provides the context and scope for each performance measure, to ensure that the measure is properly focused on the high-level issues of direct interest to the senior management. The document describes the approach that UC and the Laboratory will take for the evaluation of performance on the measure, provides qualifiers that define special circumstances that could affect performance, and specifies the leaders at the Laboratory directly responsible for the measure including cross-institutional assessment of performance. Each organization contributing to meeting the performance of the measure is responsible for their performance of the elements that are integral to the overall measure.

Each performance measure evaluation will consider the quality of the work as well as performance of the defined output. For each measure, an “assessment file” will be maintained incorporating results from relevant NNSA programmatic reviews, external/internal peer reviews, and other pertinent information that will assist in evaluating performance. The “assessment files” will be the basis for the Laboratory’s self assessments.

The UC Vice President for Laboratory Management will submit the final report to the Site Managers and the NNSA Administrator. This report will incorporate input from the Laboratory Director’s evaluation and the reviews by the President’s Council and its panels. An annual Performance Evaluation Report prepared by the NNSA Site Office Manager will provide an evaluation of the Laboratory’s performance during the appraisal period. The UC Evaluation Report is the primary basis for the annual appraisal of performance, recognizing that NNSA/DOE will take into account other pertinent information, including the timely availability of adequate funding, operational oversight, program reviews and audits.

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10.0 Standards and Requirements

10.1 Contract 48 Requirements

Contract 48 stands as the fundamental basis for the operations of the Laboratory. The current official language and provisions provide the legal basis for all activities. Clause 5.5—DEAR 970.5204-78, Laws, Regulations, and DOE Directives (June 1997) (Modified), taken from 48 CFR 970.5204-78 and effective October 1997 (see Section 18B), contains the fundamental operative statement in 5.5(a):

“In performing work under this contract, the Contractor shall comply with the requirements of applicable federal, state, and local laws and regulations, unless relief has been granted in writing by the appropriate regulatory agency.”

which is continued in 5.5(b):

“In performing work under this contract, the Contractor shall comply with the requirements of those DOE Directives, or parts thereof, identified in the List of Applicable Directives (List) referred to in Appendix G, DOE Directives.”

With the completion of the formal process and approval of the WSS set, as described in the next section, they were incorporated in Contract 48 per the last part of 5.5(f):

“When such a process is used, the set of tailored ES&H requirements, as approved by DOE pursuant to the process, shall be incorporated into the List as contract requirements with full force and effect. These requirements shall supersede, in whole or in part, the contractual environmental, safety, and health requirements previously made applicable to the contract by the List.”

The WSS set in Contract 48 provides the ES&H requirements for LLNL as of August 5, 1999. These, along with the ongoing actions on non-contract standards and practice, are being incorporated through an established LLNL process into the *ES&H Manual* and other operating documentation (see Section 12.2). Contract 48 contains in Clauses 5.5 and 6.7 the language providing for WSS and ISM, respectively, and their incorporation upon completion, as described in other sections of this Description.

10.2 Work Smart Standards

LLNL, UC, and DOE used the Necessary and Sufficient (N&S) Process to select a comprehensive set of standards that define the ES&H requirements for LLNL into Contract 48 in accordance with Clause 5.5 (f):

“Environmental, safety, and health (ES&H) requirements applicable to this contract may be determined by a DOE approved process to evaluate the work

and associated hazards and identify an appropriately tailored set of standards, practices, and controls...”

Applying the N&S process requires the adherence to the DOE Policy, “Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management,” DOE P 450.3 (Ref. 12) of January 25, 1996, and the DOE Manual, “*The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards*,” DOE M 450.3-1 (Ref. 13) of January 25, 1996. These documents define the process and its required elements. During the establishment of the N&S Process at DOE, it was determined that the resulting standards should be called Work Smart Standards (WSS).

With these contractual obligations and the DOE Policy and supporting documents, the Laboratory and NNSA/OAK initiated the process in May 1997 to select a tailored WSS set applicable to the work at LLNL. The process was formal with structured elements and accompanying documentation. A convened group, which is the process steering committee with members from LLNL, UC, and NNSA/OAK, was established to manage and support the successful completion of the process and selection of the WSS set. ES&H professionals from LLNL, NNSA/OAK, UC, and other DOE sites working with Laboratory program, facilities, and operations personnel obtained a comprehensive understanding of the work and hazards and established the appropriate set of standards that when implemented will provide adequate protection to the workers, the public, and the environment. All personnel involved were selected individually by the convened group upon review of credentials against established participation criteria. All participants were trained to the DOE approved training modules.

The N&S process, utilizing a team approach, focuses on the work and its associated hazards to select those standards that provide the appropriate level of safety. For LLNL, the work and associated hazards were identified for all nuclear facilities and a carefully chosen set of representative non-nuclear facilities. Based on this information and extensive knowledge of ES&H standards, the Standards Identification Team selected the appropriate standards that collectively apply to the institution. These standards were reviewed internally and confirmed to be appropriate and feasible by an outside independent team of ES&H experts. With the satisfactory completion of the confirmation step in March 1999, the WSS set was forwarded to the approval authorities, the LLNL Director and NNSA/OAK Manager, signed August 5, 1999, and incorporated into Contract 48. A similar N&S process was used to identify WSS for LLNL work conducted at NTS. The process was concluded in 2002 and additional standards will be incorporated into Contract 48.

The WSS set is important as an input to the ISMS and as a key operational component for developing controls. It also fulfills in a conscious, organized, and broadly reviewed manner Guiding Principle 5: Identification of Safety Standards and Requirements. The

evaluation of work at the facility and activity level, as described in Sections 6 and 7 of this Description uses the WSS set obtained by the N&S process. Establishing the WSS set while this Description was in preparation allowed the appropriate connections to be made and to align them both with the current thinking and needs. In the relationship between WSS and ISMS, the WSS set provides the general and specific requirements which are tailored to LLNL activities, and the ISMS establishes the structure and implementation mechanisms for using the WSS set as the basis for performing work safely.

10.3 Maintenance of Work Smart Standards

As change occurs, there will be new knowledge, technologies, and issues. With these, there will be new laws, regulations, and standards. Consequently, there is a need to periodically review and update the WSS set in Contract 48 again using a formal process. A formal Change Control Process for the WSS, utilizing the principles of the N&S Process, has been identified. The Change Control Process provides an important opportunity to keep the WSS set up to date and includes provisions for addressing new and special situations that might arise from any source.

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11.0 Evaluating and Resolving Non-Compliances

11.1 Requirements

Under the provisions of Contract 48, the Laboratory conducts an annual institutional-level self-assessment to evaluate its management performance in a number of administrative and operational areas, including ES&H. This self-assessment is made against a set of POPMs (see Section 9.2). NNSA/LSO and the University of California, Office of the President review and verify the self-assessment report and the Laboratory's performance.

Annual institutional-level self-assessment, ARO evaluations, and other special reviews are accompanied by NNSA/LSO management through appraisals of the Laboratory, which include several ES&H areas.

In addition to the institutional assessments, LLNL has a well-developed annual self-assessment program that is specified in the *ES&H Manual*. These Laboratory organization self-assessments evaluate the effectiveness of adherence to ES&H requirements and implemented controls at both the facility and activity levels.

The formal self-assessments of the Laboratory provide the status at a particular time. Also important are the wide variety of on-going, multi-faceted review processes conducted by LLNL personnel that provide timely information and insight on the status and performance at each level within the Laboratory.

11.2 Corrective Action Process

The deficiencies identified in operations and facilities resulting from self-assessments, audits, reviews, appraisals, and occurrence reports, by Laboratory and external oversight entities are reviewed to determine appropriate corrective actions. The objective of this process is to improve safety in the workplace and compliance with ES&H requirements. The responsible management chain assigns responsibility for implementing actions to correct self-assessment deficiencies and uses the deficiency tracking system to monitor the status until the actions are completed and verified. For institutional and cross-cutting issues and deficiencies, the assignment of responsibility is made by the SEP AD. Findings (and recommendations as appropriate) from appraisals, audits, and reviews of operations are documented in reports and put into the deficiency tracking system. In response, management develops action plans to correct the identified operational and management problems when appropriate. The plans include schedules for completing the corrective actions and provides for regular reporting, as required, to the agency or office that conducted the appraisal until all deficiencies are closed out.

A corrective action process is also implemented by management in response to findings and judgment of needs identified in incident analysis reports. The *ES&H Manual* contains a description of the Laboratory's incident analysis process and follow-up requirements. Corrective action plans are also being developed as a result of the analysis of immediate, contributing, and root causes of DOE-reportable occurrences. The primary objective in formally reviewing incidents, accidents, and other occurrences is to prevent the recurrence of the event and to reduce risk in a specific operation or facility.

In FY03 LLNL implemented an Issues Management System through the *ES&H Manual*. Senior management uses this System to identify, track, and resolve institutional cross-cutting issues that require senior management attention. This System is proactive to make improvements to strengthen ISMS processes and will also provide a focus on deficiencies that require the senior DOE/NNSA and LLNL management level attention. As the Issues Tracking System (ITS) is implemented throughout LLNL (see Section 11.3), the Issues Management System will be folded into ITS and ITS will become the single repository for Lab-wide tracking of ES&H issues.

LLNL adopted a process for developing and tracking Corrective Action Plans that are prepared in response to institutional ES&H assessments, specifically those developed in response to DOE or NNSA assessment reports and ARO institutional assessments. The Corrective Action Plans require concurrence by Line Management and the ARO and are approved by the Deputy Director of Operations.

11.3 Deficiency Tracking System

The Laboratory's deficiency tracking system was established to track the status of ES&H deficiencies from the time they are identified until they are resolved. Corrective actions are tracked on a computer-based system, administered by ARO, designated the Deficiency Tracking (DefTrack) System. This process is being converted to a web-based system in FY04. The new web-based system, the Issues Tracking System (ITS), will also be used to track issues in the Issues Management System. LLNL is phasing in the use of ITS, that will eventually replace DefTrack.

Specific areas and items of particular interest to the Laboratory were identified and assigned a compliance code. The compliance codes are listed in "families" related by their general category; for example, under environmental issues are air quality, NEPA, PCB, water quality, etc., and under the general heading of health and safety-related issues are such areas as industrial hygiene, industrial safety, fire safety, etc. Generic codes are also contained in ITS to accommodate findings that are not included as specific compliance codes. The fine-grain of the compliance code structure facilitates a "trending" process that materially contributes to the development and implementation of effective problem solution strategies.

A set of severity criteria was developed to complement the compliance codes to gather information not only on the types of ES&H issues that occur at the Laboratory, but to

determine their severity as well. These severity criteria identify the priority assigned to correcting the deficiencies.

Each directorate enters and maintains its deficiencies on the ITS database. Certain categories of deficiencies are reflected in the ITS “Lab View.” The Lab View provides access by other stakeholders, (e.g., institutional and support group users) that can identify cross-cutting or institutional issues. In addition, ARO provides trending reports to individual directorates and develops an institutional summary report annually.

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12.0 Flow Down of Requirements

12.1 Basics

The LLNL institutional safety requirements apply Laboratory-wide to the entire workforce. These are now contained in the WSS set in Contract 48. The ISMS provides the process to connect the WSS set to the work, implement them, and to conduct work safely. By executing work in accordance with the controls developed from the WSS set the workforce, the public, and the environment are adequately protected.

The LLNL ISMS incorporates tailoring of requirements in addressing mission needs and the hazards involved. This Description and the *ES&H Manual* provide the institutional approach for integrating safety requirements into the processes of planning and conducting work and are the basis for alignment and content of the lower level documents. The ISMS becomes more detailed and specific in the lower level documents that provide the organizational structures (directorates, departments, and divisions) and operational processes.

Laboratory operations are addressed through safety management processes and controls contained in the *ES&H Manual* and other documents. These processes include management direction for planning and conducting work activities and facility management for work performed on the LLNL sites as well as for work performed by LLNL personnel at other locations.

The *ES&H Manual* and other institutional level documents establish the processes to be used by Laboratory programs and organizations, facilities, and the Laboratory workforce. These documents include formal processes, including configuration management, used throughout the Laboratory for applying and establishing institutional level requirements and practices locally at the facility and activity levels.

As hazards increase, so does the formality, intensity, and redundancy of controls and assurance measures. Laboratory manuals and institutional documents define the explicit institutional consistency for formality of planning, documentation of process activities, record keeping, the level of independence of people involved in their review, and confirmation of adequacy needed for establishing facility- and activity-specific expectations. They allow the established requirements to be appropriately tailored to meet specific needs of facilities and activities while covering a wide range of work and the associated hazards. These manuals and other institutional level documents also establish Laboratory requirements for other areas of safety management that involve development and tracking of corrective actions, such as occurrence reporting, incident and accident analyses, and self-assessments and improvement processes. Similarly, they establish technical requirements and often prescribe explicit administrative and engineered controls for specific hazards. The required controls are mandatory anywhere throughout the Laboratory where the work activity manifests similar hazards.

12.2 The ES&H Manual Process

The new process for establishing LLNL's ES&H requirements involves three key steps:

- 1) Development of the WSS set and incorporation of the set into Contract 48 (See Section 10).
- 2) Identifying new and changing laws and regulations, Contract 48 requirements, and UC policies as applicable to current and new work at LLNL. This is accomplished by the WSS Change Control Process.
- 3) Incorporation of the appropriate requirements from the WSS set into the *ES&H Manual*.

The overall process is described in the following sub-sections and shown in Figure 12.1.

12.2.1 Identification of Requirements

LLNL's ES&H requirements are derived from numerous sources, but come primarily from federal, State of California, regional, and local statutes, regulations, and ordinances; DOE directives; national consensus standards; and University of California policies. These regulatory and contractual requirements are dynamic and cross many technical disciplines. These are all included in the LLNL WSS set and incorporated into Contract 48 as described in Section 10.

LLNL relies primarily on the professional staff in its institutionally managed ES&H support organizations (e.g., HCD, EPD, and HSD), the Office of Contract Management, and the Office of the Laboratory Counsel to monitor for new and changing regulations and DOE directives that pertain to the work, its associated hazards at LLNL, and the standards in the WSS set. LLNL interacts with regulatory agencies, UC, and DOE staff through meetings and site visits. The Laboratory also makes heavy use of modern communications systems as part of its information resources. When requested, ES&H experts and programmatic personnel review and comment on proposed revisions to existing DOE directives, new directives, and proposed rules.

12.2.2 Evaluation of Requirements

Management of the appropriate ES&H support organization assigns departmental staff to review, interpret, and analyze proposed and final regulations, rules, DOE directives and so forth. This review assesses whether the potential requirements specifically apply to the work performed at LLNL and, if so, decides (1) whether compliance actions will have to be implemented Laboratory-wide or limited to only one or a few organizations, and (2) when they become effective through the WSS Change Control Process. There are conscious

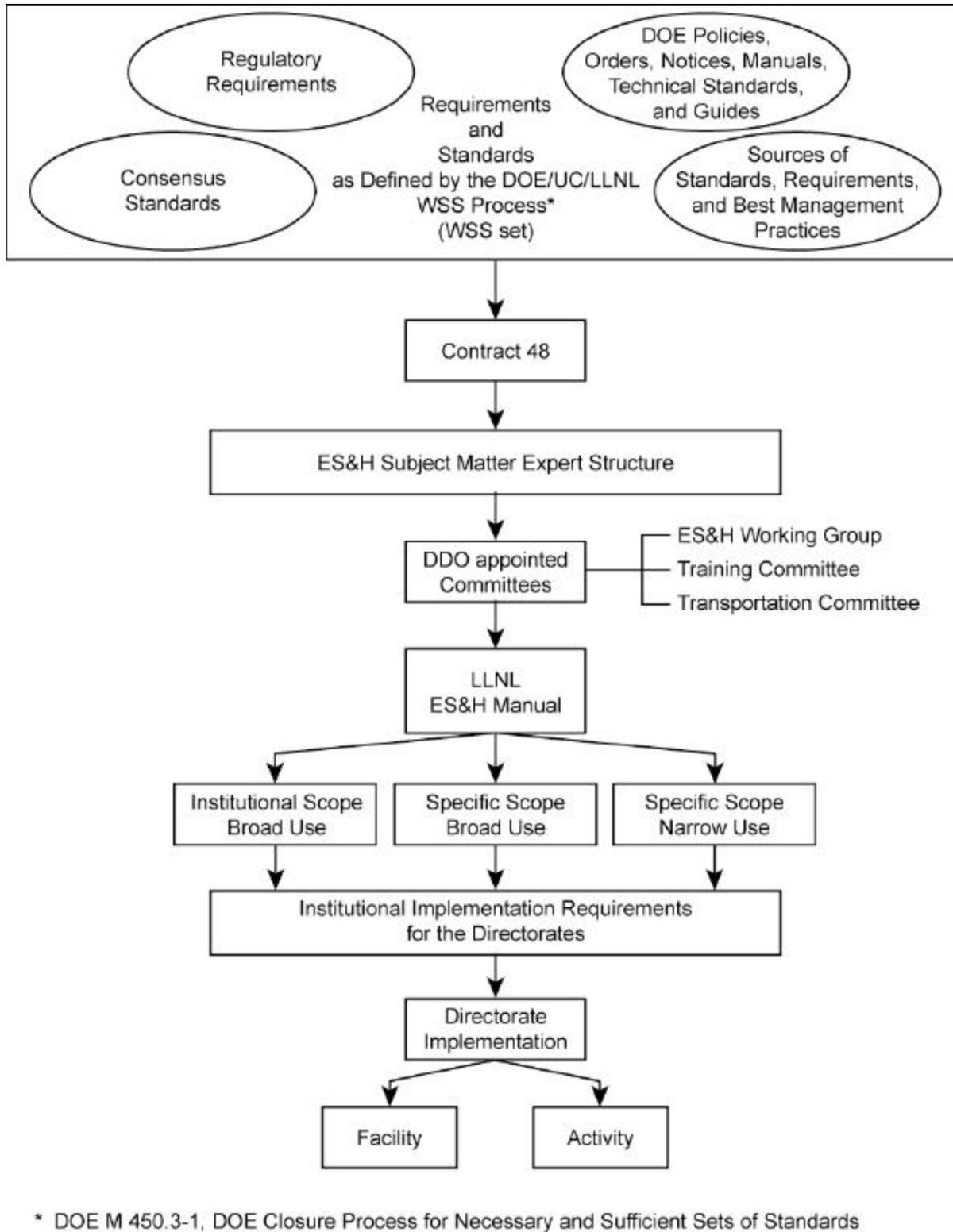


Figure 12.1 Information Flow-Down Process for the *ES&H Manual* and Implementation.

considerations of the scope and use of potential requirements, whether they have Institutional Scope and Broad Use, Specific Scope and Broad Use, or Specific Scope and Narrow Use (see Section 14.1 for definitions), to direct and use them properly. The potential impacts on Laboratory operations are also evaluated; e.g., the need for additional training, record keeping, reporting, new instrumentation systems, and modifications of existing facilities and operations.

The next step involves a review of the analysis of new requirements and impacts by the DDO appointed committees, particularly when institutional implementation of requirements is indicated and significant costs are associated with compliance. The organizations represented on the DDO-appointed committees provide feedback to the ES&H professionals on programmatic and cost impacts, and the practicability of proposed implementation actions.

In some situations, the impact of a requirement or standard is limited to a small group of individuals or a specific department. These limited impact requirements may be handled directly by the impacted organization through their Subject Matter Experts.

12.2.3 Incorporation of Requirements

A variety of activities may be used in the process of communicating new requirements once they have been determined. These include establishing a timeline for implementation and determining how the requirement will be added into the documentation base. This may result in a new policy or guidance document, or a modification to existing documentation, such as a modification to the *ES&H Manual*.

The *ES&H Manual* is developed and revised to aid management in integrating requirements into Laboratory work activities. This manual either contains specific requirements or points to other documents containing the requirements applicable at LLNL. Generally, if the requirements are applicable to only a small subset of individuals at LLNL, or if the requirements are extensive and complex, the *ES&H Manual* will merely point back to the original requirements. In those situations when the *ES&H Manual* provides pointers, the ES&H professionals will assist in the interpretation and implementation of the applicable requirements.

12.2.4 Requirements to Users

Individuals responsible for work activities are responsible for ensuring the hazards associated with the work are analyzed and controlled according to the *ES&H Manual*. Controls in the *ES&H Manual* or that are identified by the ES&H professionals to reduce hazards are to be implemented by those performing the work activities, unless an exemption from those controls has been appropriately approved. The Laboratory has a formal process for obtaining exemptions and variances as described in Section 12.6.

12.3 Subcontractor Safety Management

In ISM, the necessary focus of the subcontractor requirements is on the safety of the workers and the impact their actions have on the environment. Basic to all of the requirements are those in Contract 48, Clause 6.7, reproduced in Section 16A. In the LLNL ISMS, the core requirements for subcontractors are in Section 6.2.3.4. Application of these requirements along with other appropriate core requirements in Section 6 and use of the provisions of Section 7 and the *ES&H Manual* are necessary to meet the subcontractor safety management responsibilities.

Procurement & Materiel is to ensure that safety requirements are included in the subcontractor operational process and procedures that control how subcontractors perform work for LLNL. The system to accomplish this needs to involve the organizations requesting the subcontract work and as necessary the appropriate ES&H Teams. All are critical elements of the system and each have their own particular responsibilities in a structured process that is defined in Section 6.2.3.4. The system ensures that appropriate subcontract safety requirements are included in contractual language that binds the subcontractor to maintain alignment with the established procurement practices. These safety requirements include the applicable safety clauses and safety standards.

The system includes the details of the Laboratory's oversight responsibilities for a subcontractor's safety management system in the subcontract language, ensure the flow down of appropriate safety requirements, and ensure that subcontractors are evaluated and selected on the basis of historical safety performance and other relevant criteria. Additional information and elaboration are in the *ES&H Manual* and the P&M Procedures.

12.4 Procurement Safety Management

The procurement of goods and materiel is a key function to be addressed as part of ISM. This is accomplished in the LLNL ISMS through the use of a procurement safety management process that determines the hazards of the goods and materiel to be procured, received, and delivered to the point of intended use. The process provides a hazards determination for ordered goods and materiel that are hazardous, dangerous, or toxic. The planned use of these is addressed in the work activity evaluation, documentation, and authorization process defined in Section 7.3.

In the procurement safety management process, the requesting organization is to provide the procurement entity with the proper hazards determination so that the safety responsibilities can be fulfilled. This is consistent with the safety requirements in Contract 48, the applicable core requirements in Section 6, and the provisions of Section 7 and the *ES&H Manual*. In the process, the organization requesting the goods and materiel evaluates and determines the hazards of the goods and materiel being

ordered. The appropriate ES&H Team assists in this as necessary. The resulting hazards determination is provided to the procurement entity along with the purchase request. P&M maintains the necessary procedures for the conduct of this process. Additional information and elaboration are in the *ES&H Manual* and the P&M Procedures.

12.5 Lessons Learned

Lessons Learned are to be shared to improve operational safety by benefiting from the experience of others. Lessons Learned are to be prepared and distributed whenever there is an opportunity to share a valuable new work practice or warn others of an adverse practice, experience, or product. The core requirements for lessons learned are defined in Section 6.7.1.6.

LLNL has an established Lessons Learned program. It includes the basic elements presented in DOE Standard “Development of Lessons Learned Programs,” DOE-STD-7501. This standard is used as it is included in the WSS set and otherwise provides guidance in the daily conduct of the LLNL Lessons Learned program. Lessons Learned is an integral part of the Laboratory’s ISMS and is an important mechanism in accomplishing DOE Core Function No. 5—Provide Feedback, and Continuous Improvement.

The Lessons Learned Coordinator, who is appointed by the ES&H Information Office Manager in support of the ES&H Working Group, conducts the Lessons Learned program. The Lessons Learned Coordinator, in consideration of the core requirements, is responsible for:

- Gathering and analyzing information while focusing on issues most relevant to LLNL operations.
- Establishing and maintaining a communications and coordination process with the Laboratory’s PAAA Office on topics and items of mutual interest and use.
- Coordinating a review of prospective Lessons Learned by the various ES&H organizations, including the ES&H Working Group executive committee.
- Distributing Lessons Learned to individuals identified by each directorate’s Assurance Manager in a timely manner.
- Posting Lessons Learned on the “LLNL only” website.
- Serving as a point of contact for follow-up and feedback to the Laboratory, as necessary, on actions taken in response to Lessons Learned.

- Transmitting to DOE Lessons Learned through DOE's website for Lessons Learned. (LLNL Legal, TID Review and Release, ES&H Working Group, and HCD will review all Lessons Learned prior to release.)

Directorates are to encourage employees to bring to the attention of their supervisor or directorate Assurance Manager topics that could serve as possible Lessons Learned. Each Assurance Manager, in consideration of the core requirements, is responsible for:

- Ensuring distribution of Lessons Learned to appropriate LLNL personnel.
- Bringing to the attention of the ES&H Working Group appropriate Lessons Learned in a timely manner.
- Identifying Lessons Learned that require follow-up action and providing information to the Lessons Learned Coordinator regarding what action has been taken.
- Identifying Lessons Learned from his or her directorate to be forwarded to the Lessons Learned Coordinator.

All Lessons Learned communications are to include: what happened, Lessons Learned from the activity or incident, recommendations of actions to be taken, and where to get additional information or help. Lessons Learned are to be incorporated, as appropriate and in a timely manner, into LLNL safety training.

Lessons Learned are to be integrated into work planning and control so the full benefit of relevant and timely Lessons Learned can be applied. The authorizing organization is to ensure that applicable Lessons Learned maintained on the "LLNL only" website are considered during the process of authorizing work. Similarly, each is to incorporate a review of Lessons Learned maintained on the "LLNL only" website as part of its self-assessment program to ensure continued utilization of relevant Lessons Learned.

Using the Lessons Learned Program, there are important opportunities to not repeat problems that have been addressed and fixed in other places and thereby improve safety. An additional value is to obtain improved consistency across DOE in the fixes made to problems encountered and included in Lessons Learned.

12.6 Exemptions and Changes

The Laboratory has formal processes, described in the *ES&H Manual*, by which organizations and individuals can seek deviations, exemptions, variances, or waivers to institutional requirements contained or referenced in the *ES&H Manual*. Given valid justification, organizations and individuals can obtain a particular exception from established institutional requirements as long as equivalent or compensatory measures are in place to meet requirements. The exception nomenclature, the necessary

accommodations, and approval levels depend on the requirement specifics. This may require DOE or other governmental agency approval.

The *ES&H Manual* and other ES&H institutional documents can be changed at the discretion of the Laboratory as long as they remain consistent with the requirements in Contract 48 and this Description.

Changes to existing ES&H policies and procedures or the generation of new ES&H policies may be proposed by a directorate, the ES&H staff, a DDO-appointed committee such as the ES&H Working Group, or other senior managers. New ES&H policies or major changes to existing ES&H policies and procedures are recommended by the relevant Subject Matter Experts or appropriate DDO-appointed committee to the DDO for approval.

13.0 ISMS Change Control Board Procedure

13.1 Purpose

This procedure establishes requirements for the conduct of the LLNL ISMS CCB. The CCB is tasked with reviewing and approving requests for changes to the LLNL ISMSD and Work Smart Standards set.

13.2 Scope

This procedure applies to all personnel involved in submitting, reviewing, or approving requests for changes to the ISMSD.

13.3 Composition of the Change Control Board

13.3.1 Membership

The CCB will be composed of the following, each appointed by their cognizant organization:

- NNSA/LSO Representative.
- LLNL Representative.
- University of California Representative.

13.4 Responsibilities

13.4.1 NNSA/LSO Manager

The NNSA/LSO Manager is responsible for approving any changes to the LLNL Institutional ISMS Descriptions. The NNSA/LSO Manager is the Approving Official.

13.4.2 CCB Chair

The NNSA/LSO Manager will designate a NNSA/LSO representative as a CCB member. For consideration of ISMS changes, this NNSA/LSO representative will serve as the CCB Chair. The CCB Chair is responsible for:

- Coordinating change request packages.
- Reviewing submitted ISMS Description change request data.
- Requesting additional technical personnel to attend the CCB meetings to serve as advisors to the CCB Members.

- Scheduling meetings of the CCB at a minimum annually, but additionally when requests for change are considered significant. A significant change would be one resulting from a change to a DOE Order or Policy impacting ISMS or a substantial change to the Laboratory's implementation of ISMS contained in the system description.
- Recommending that the Approving Official approve or disapprove requests for change to the LLNL Institutional and Superblock ISMS Descriptions. The CCB Chair will also provide any minority opinions to the NNSA/LSO Manager for consideration. If the change is NNSA/LSO originated and consensus on the change has not been reached, the minority opinion will be provided to the Deputy NNSA/LSO Site Manager and the LLNL SEP AD for resolution (see Section 13.5.4 below).
- Directing the conduct of the CCB.

13.4.3 CCB Members

Members of the CCB are responsible for:

- Coordinating and submitting change request packages originating in their respective organizations to the CCB Chair.
- Reviewing submitted change requests.
- Attending CCB meetings as required.
- Reaching consensus with other CCB Members to approve or disapprove requests for change, or documenting majority and minority opinions if consensus cannot be reached.

13.5 Procedure

13.5.1 CCB Preparation

- The organization originating a change will submit the change through their designated CCB member to the CCB Chair.
- The CCB Chair will direct that a CCB be convened using the criteria in 13.4.2.4.

- Upon receipt of the Request for Change Package, the CCB Chair will distribute copies of the package to all CCB members for review.
- The CCB Chair will review the package and determine if additional information is required or if additional technical personnel should be present at the CCB's proceedings to provide input to the CCB members.
- If additional technical information is needed or personnel are required to attend CCB proceedings, the Chair will notify the appropriate CCB member of the requirements at least one week prior to the CCB convening date and will specify what technical information or personnel the member is expected to provide.

13.5.2 Conduct of the CCB Meetings

- The CCB Chair will assign an individual to record the minutes of the CCB meeting. CCB meeting minutes will contain as a minimum, the date and time the CCB was convened, the names of CCB members, a list of attendees, the proposed changes discussed, and the results.
- The CCB will review each change request submitted.
- A representative of the organization submitting the change request will discuss the change request. The discussion will include why the change is necessary, implementing assumptions as applicable, and the impact of the change.

13.5.3 Records

The following records will be maintained for each CCB meeting:

- Change request packages, including copies of Change Request Forms signed by the CCB Chair.
- CCB meeting minutes.

13.5.4 Function of the CCB

- After any necessary discussion, the CCB Chair has the responsibility to recommend the final approval or disapproval of a change request for ISMS Descriptions to the Approving Official.
- For change requests originating with LLNL or UC, a majority vote of the CCB members is sufficient for the CCB Chair to recommend approval or disapproval to the Approving Official. The CCB Chair will forward any majority and minority opinions to the Approving Official for consideration. A CCB consensus that the change is not to be recommended terminates

further consideration of the change. (See the ISMS Change Control Board Process Diagram in Figure 13.2.)

- Change requests originating with NNSA/LSO that are not unanimously recommended for approval by the CCB will be forwarded to the NNSA/LSO Technical Deputy Manager for Safety and Environmental Programs (DSM) and the SEP AD for resolution. If they agree that the change is required, the change request will be forwarded to the Approving Official for approval. Agreement between the DSM and the SEP AD that the change is not to be approved terminates further consideration of the change.
- At the conclusion of the CCB proceedings, the Chair will indicate, in the space provided on the Change Request Form, the CCB's approval or disapproval for each request for change. The Chair will then forward the Change Request Form to the Approving Official.
- A signature by the Approving Official indicating approval of a change request is NNSA/LSO's authorization for the laboratory to make the described change to the affected ISMS document.

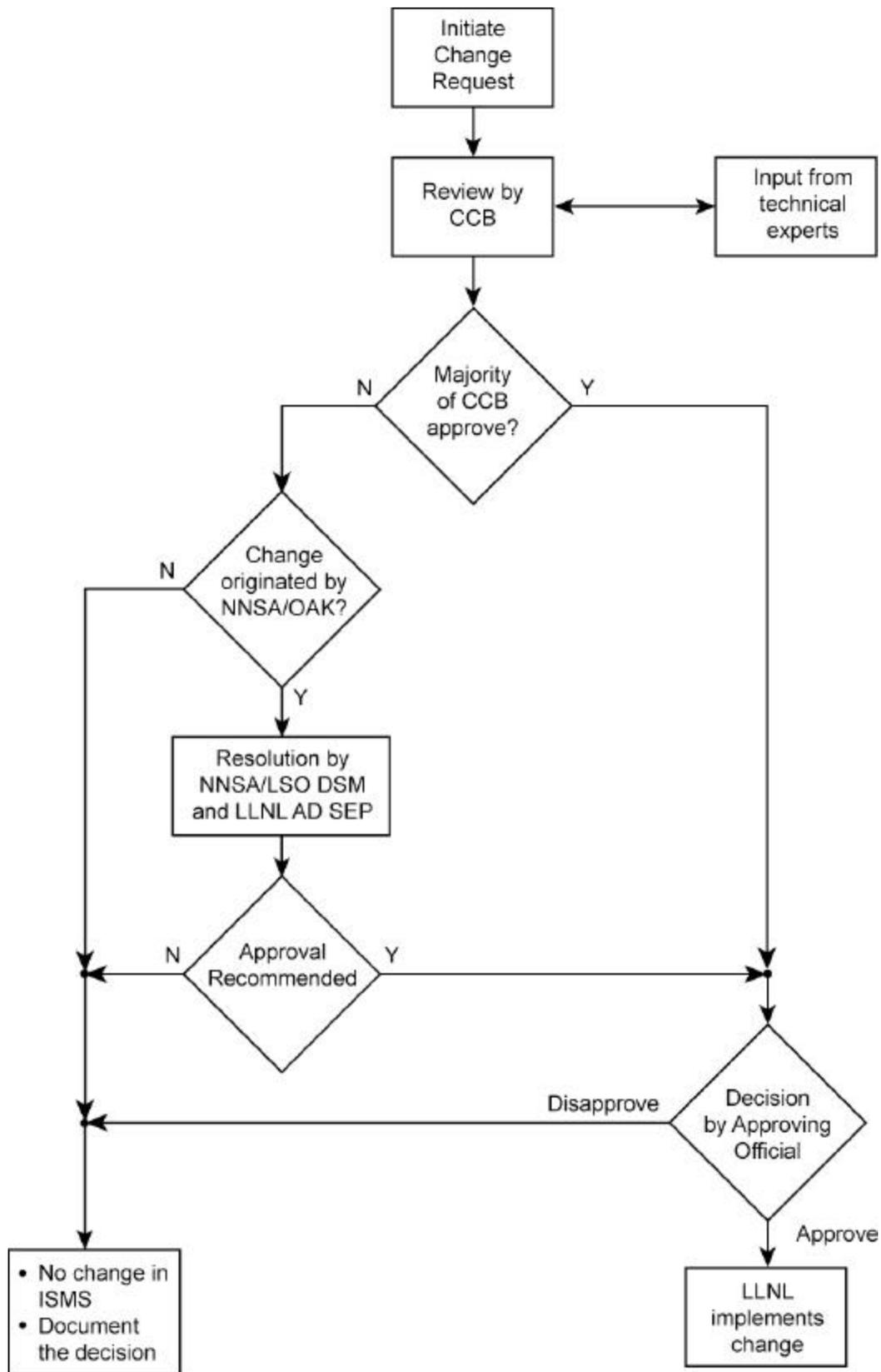


Figure 13.2 ISMS Change Control Board Process Diagram.

14.0 Definitions and Acronyms

14.1 Definitions

Associate Director's Facility Manager (ADFM)	The AD Facility Manager provides direction for the management of all directorate facilities, and is the point-of-contact for all directorate facility-related matters.
Assure	To make sure or verify that something was done.
Authorizing Individual (AI)	The person designated by an authorizing organization who is responsible for a work activity's technical, financial, administrative, and ES&H objectives. Also the individual authorized by the AD (or his or her designee) to accept and manage, on the Laboratory's behalf, the risks associated with the work activity. This person authorizes the work to proceed only after all controls are implemented and confirmed.
Authorizing organization (AO)	The Laboratory organization (e.g., directorate or group) responsible for a work activity's performance. This includes ensuring adequate funding and determining work priorities.
Base skills	The skills, knowledge, and abilities (SKAs) necessary for a particular vocation and level.
Commonly performed by the public	An activity with hazards commonly accepted by the public, the control of which require little or no guidance or training to perform the work safely.
Directorate	The set of organizational elements (e.g., departments, divisions, groups, programs, projects, offices) operating within the management responsibilities and authority of an AD.
Ensure	To cause something to be done, either by doing it or by following up on assignments and delegations to verify that something was done. To guarantee a particular outcome. The Laboratory uses this term when referring to situations involving direct responsibility for activities, as in the case of the Responsible Individual.

ES&H Professionals	The LLNL Subject Matter Experts and members of the ES&H Teams.
Facility	A building, group of buildings, or specific area of the Laboratory that is managed by a single responsible Associate Director (see Facility AD). May also be used to indicate a portion of a building, such as a laboratory or group of laboratories dedicated to a specific operation.
Facility AD	Associate Director who provides management of facility operations, concurrence of work performed in the facility, management of the safety envelope, communication of the hazards of the facility, management of the facility infrastructure, and capabilities of the safety support systems.
Facility Point of Contact (FPOC)	An individual appointed by the facility manager to help personnel with facility issues and ensure that work in the facility is compatible.
Facility Safety Plan (FSP)	A management-approved document that defines responsibilities for safe operations in a Laboratory facility, describes the hazards, and provides the basic safety rules to control these hazards. The safety rules are to be followed by all personnel present within a specific building or area. The FSP is on file with the facility manager and Hazards Control Department.
Graded approach	A method that provides for varying levels of rigor and formality when applying controls commensurate with the hazards involved. To ensure that the depth of detail required and the magnitude of resources expended for operations are commensurate with each facility's programmatic importance and potential environmental, safety, and health impact.
Hazard	A source of danger (i.e., material, energy source, or operation) with the potential to cause illness, injury, or death to personnel or damage to a facility or the environment.
Integration Work Sheet/Safety Plan	Project-specific safety plans that are required for all WAL C work.

Implementation Plan	A documented plan describing how requirements and expectations will be accomplished. Following implementation at the directorate level, directorates may transition the Implementation Plan to other established directorate plans or documents (e.g., ES&H Management Plans, ISM Management Plans, and QA Plans) that satisfies the requirements specified in this Description.
Institutional Scope and Broad Use	Requirements that are general in scope and apply broadly to the Laboratory. Examples include general ES&H programs (e.g., industrial hygiene, industrial safety, health physics, and pollution prevention), training, and quality assurance. The requirements for hazards frequently encountered at the Laboratory are generally specified in the <i>ES&H Manual</i> .
Operational Safety Plan (OSP)	A management-approved document that defines the necessary steps to be taken so that work with potentially hazardous experiments and operations can be conducted safely. Being converted to safety plans; see IWS/SP.
Organization supervising work	An organization distinguished by having responsibility for supervising or watching over the performance of people involved in carrying out a work activity and ensuring that work requirements are met.
Payroll AD	Associate Director who provides technical and specialty personnel to support program activities directly and by matrixing personnel to support the activities of other directorates. Responsible for the technical and specialty qualifications, basic job training, and administrative support. Also described as an Administrative AD.
Prestart review	A review of the integrated set of safety controls, resources, and schedules conducted before beginning a work activity.

Program AD	Associate Director who provides program deliverables through control of and use of funding. Responsible for work authorization, technical deliverables, ES&H, business management, and staff work direction. Uses the funding for personnel, facilities, and services in own directorate and buys matrixed payroll personnel and other directorate's facility capabilities, services functions, and products.
Responsible Individual (RI)	The individual directly responsible for an operation, activity, or group of activities. The RI may be at any level within the organization and is formally identified by the activity's authorizing individual. In some organizations, this person is called the work supervisor. In most cases the RI will be directing the work of others as part of the operation or activity. Examples of RI job titles include supervisor, division leader, group leader, project leader, project engineer, principal investigator, facility manager, building coordinator, lead experimenter, and lead technician.
Safety	Safety is a term applied throughout this document and is used synonymously with environment, safety, and health (ES&H) to encompass protection of the public, the workers, and the environment as defined in DOE P 450.4 (Ref. 2). Contract 48, Clause 6.7 expands the definition of safety by "including pollution prevention and waste minimization."
Safety envelope	The parameters defining the limits for safe operation of a facility or operation. For example, the maximum amount of material, the maximum operating temperature, and the maximum pressure are boundary conditions that may specify portions of the safety envelope.
Self-assessment	An assessment performed by the responsible organization to determine how well they are performing their jobs and meeting their responsibilities.
Self-assessment plan	A formal, management-approved document that describes a directorate's self-assessment activities and how often they occur, provides a schedule for completing the assessments, and identifies the reports to be generated.

Services AD	Associate Director who provides “fee for services” functions, facilities, and products. Responsible for work authorization, technical deliverables, ES&H, business management, and staff work directions.
Specific scope and broad use	Requirements that are relatively specific in scope and apply broadly to the Laboratory. Examples include emergency preparedness, fire protection, and engineering standards. For example, some engineering design standards may pass through directly to the engineers without manuals, guides, etc. to assist the engineers other than the stated recognition that the (design) standards are to be used.
Specific scope and narrow use	Requirements that are relatively specific in scope and apply to a limited set of staff, groups, or activities. Examples include firearms and personnel assurances.
Subject Matter Expert	An LLNL employee that is a recognized authority in a particular field. This might include a person from Hazards Control, the Environmental Protection Department, Engineering, Plant Engineering, Chemistry & Materials Science, Computations, and so forth.
Tailored controls	Engineered and administrative controls, as well as personal protective equipment, selected from the Work Smart Standards and LLNL’s <i>ES&H Manual</i> and designed to fit a particular work activity. Properly tailored controls will address the hazards, satisfy the applicable requirements, and provide adequate protection to the public, workers, and the environment.
Tailoring	Adapting something—such as a control, safety program, practice, or requirement within the ISMS—to suit the need or purposes of a particular operation or activity, taking into account the type of work and associated hazards.
Work Authorization Level (WAL)	A structure of levels of work connected to the hazards through the degree of understanding of the hazards and controls and documentation that exists or required for work activity authorization.

Work Smart Standards (WSS) set	The set of standards that is necessary and sufficient to meet LLNL ES&H performance expectations and objectives. The WSS set provides adequate protection for workers, the public, and the environment. All work performed at LLNL and the associated hazards must be covered by one or more of the standards in the WSS set.
Work Smart Standards Subject Matter Expert	A designated LLNL employee with knowledge and expertise relevant to the work or one of the ES&H discipline areas who selects and works with the applicable WSS.

14.2 Acronyms

AD	Associate Director
AHJ	Authority Having Jurisdiction
AM	Assurance Manager
ARG	Accident Response Group
ARO	Assurance Review Office
BN	Bechtel Nevada
CCB	Change Control Board
CFR	Code of Federal Regulations
DAD	Deputy Associate Director
DDO	Deputy Director for Operations
DEAR	Department of Energy Acquisition Regulations
DMLSO	Deputy Manager for the Livermore Site Office (NNSA/LSO)
DoD	United States Department of Defense
DOE	United States Department of Energy
DOT	United States Department of Transportation
DSA	Documented Safety Analysis
DTRA	Defense Treaty Reduction Agency
EPD	Environmental Protection Department (at LLNL)
ES&H	Environment, Safety, and Health
FPOC	Facility Point of Contact
FSP	Facility Safety Plan

G&A	General and Administrative (the principal overhead, indirect cost account funding of Laboratory support activities).
GPP	General Plant Projects
HAR	Hazard Analysis Report
HCD	Hazards Control Department
HRP	Human Reliability Program
HSD	Health Services Department
INEEL	Idaho National Engineering & Environmental Laboratory
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ISMSD	Integrated Safety Management System Description
IWS	Integration Work Sheet
LANL	Los Alamos National Laboratory
LAO	Laboratory Assurance Office (QA)
LLNL	Lawrence Livermore National Laboratory
LSO	Livermore Site Office
LTRAIN	Livermore Training Records And Information Network
M&O	Management & Operations
N&S	Necessary & Sufficient
NEPA	National Environmental Policy Act
NEST	Nuclear Emergency Search Team
NNSA/LSO	National Nuclear Security Administration/Livermore Site Office
NNSA/NSO	National Nuclear Security Administration/Nevada Site Office
NNSA/OAK	National Nuclear Security Administration/Oakland Operations Office
NTS	Nevada Test Site
OFC	Organizational Facility Charge
OPC	Organizational Personnel Charge
OSHA	Occupational Safety & Health Administration

OSP	Operational Safety Plan
P&M	Procurement and Materiel Department (at LLNL)
PAP	Personnel Assurance Program
PCB	Polychlorinated biphenyl
PHA	Preliminary Hazards Analysis
PI	Principal Investigator
PMC	Program Management Charge
POC	Point of Contact
POPMs	Performance Objectives and Performance Measures
PSAP	Personnel Security Assurance Program
QA	Quality Assurance
RAP	Radiological Assessment Program
RHWM	Radioactive and Hazardous Waste Management
RI	Responsible Individual
RRAs	Roles, Responsibilities, and Authorities
SAD	Safety Assessment Document
SBD	Safety Basis Document
SEP	Safety and Environmental Protection
SKAs	Skills, Knowledge, and Abilities
SME	Safety Management Evaluation
SNL	Sandia National Laboratories
SP	Safety Plan
SR	Savannah River
SRP	Surveillance Requirement Procedure
TSRs	Technical Safety Requirements
UC	University of California
WSS	Work Smart Standards

15.0 References

1. DOE M 450.3-1, "The Department of Energy Closure Process for Necessary and Sufficient Sets of Standards," dated January 25, 1996.
2. Department of Energy (DOE) Prime Contract W-7405-ENG-48 (Contract 48), October 1, 1997 with approved modifications.
3. DOE P 450.4, "Safety Management System Policy," dated October 15, 1996.
4. Memorandum to all Department and Contractor Employees, from Secretary Bill Richardson, "Safety-Accountability and Performance," March 3, 1999.
5. DOE G 450.4-1A, "Integrated Safety Management System Guide for Use with Safety Management System Policies (DOE P 450.4, DOE P 450.5, and DOE P 450.6)", dated May 27, 1999.
6. Letter from R. Promani (NNSA/OAK) to D. K. Fisher (LLNL), "Contract No. W-7405-ENG-48, Clause 6.7, Contracting Officer Guidance on Integrated Safety Management System (ISMS) Description Document Development and Implementation," dated August 18, 1998.
7. DOE G 450.4-1, "Integrated Safety Management Guide for Use with DOE P 450.4, Safety Management System Policy, and DEAR Safety Management System Contract Clauses," dated November 26, 1997.
8. UCRL-AR-131934, "Superblock V-Integrated Safety Management System Description," October 1998.
9. NNSA/OAK and LLNL/DNT Authorization Agreement for the Plutonium Facility – Building 332, February 5, 2003.
10. Designated Commercial Services List.
11. UCRL-AR-120251-3, "Environmental, Safety, and Health Management Plan (Fiscal Year 2001–2005)," May 6, 1999.
12. DOE P 450.3, "Authorizing Use of the Necessary and Sufficient Process for Standards-Based Environment, Safety and Health Management," dated January 25, 1996.

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16.0 Appendices

A. Clause 6.7—The ES&H DEAR Clause

This clause is taken from 48 CFR 970.5204-2 and is consistent with DOE Policy 450.4 Safety Management System Policy. This clause is the foundation of ISM.

CLAUSE 6.7—DEAR 970.5204-78

Integration of Environment, Safety, and Health into Planning and Execution (June 1997)

- a) For the purposes of this clause, safety encompasses environment, safety and health, including pollution prevention and waste minimization; and employees include subcontractor employees.
- b) In performing work under this contract, the Contractor shall perform work safely, in a manner that ensures adequate protection for employees, the public, and the environment and shall be accountable for the safe performance of work. The contractor shall exercise a degree of care commensurate with the work and the associated hazards. The Contractor shall ensure that management of environment, safety, and health (ES&H) functions and activities becomes an integral but visible part of the Contractor's work planning and execution processes. The Contractor shall, in the performance of work, ensure that:
 - 1) Line management is responsible for the protection of employees, the public, and the environment. Line management includes those Contractor and subcontractor employees managing or supervising employees performing work.
 - 2) Clear and unambiguous lines of authority and responsibility for ES&H are established and maintained at all organizational levels.
 - 3) Personnel possess the experience, knowledge, skills and abilities that are necessary to discharge their responsibilities.
 - 4) Resources are effectively allocated to address ES&H, programmatic, and operational considerations. Protecting employees, the public, and the environment is a priority whenever activities are planned and performed.
 - 5) Before work is performed, the associated hazards are evaluated and an agreed-upon set of ES&H standards and requirements are established which, if properly implemented, provide adequate assurance that the employees, the public, and the environment are protected from adverse consequences.

- 6) Administrative and engineering controls to prevent and mitigate hazards are tailored to the work being performed and associated hazards. Emphasis should be on designing the work and/or controls to reduce or eliminate the hazards and to prevent accidents and unplanned releases and exposures.
 - 7) The conditions and requirements to be satisfied for operations to be initiated and conducted are established and agreed-upon by DOE and the Contractor. These agreed upon conditions and requirements are requirements of the contract and binding upon the Contractor. The extent of documentation and level of authority for agreement shall be tailored to the complexity and hazards associated with the work and shall be established in a Safety Management System.
- c) The Contractor shall manage and perform work in accordance with a documented Safety Management System (System), that fulfills all conditions in paragraph (b) above at a minimum. Documentation of the System shall describe how the Contractor will:
- 1) Define the scope of work,
 - 2) Identify and analyze hazards associated with the work,
 - 3) Develop and implement hazard controls,
 - 4) Perform work within controls; and
 - 5) Provide feedback on adequacy of controls and continue to improve safety management.
- d) The System shall describe how the Contractor will establish, document, and implement safety performance objectives, performance measures, and commitments in response to DOE program and budget execution guidance while maintaining the integrity of the System. The System shall also describe how the Contractor will measure system effectiveness.
- e) The Contractor shall submit to the Contracting Officer documentation of its System for review and approval. The Contracting Officer will establish dates for submittal, discussions, and revisions to the System. The Contracting Officer will provide guidance on the preparation, content, and review and approval of the System. On an annual basis, the Contractor shall review and update, for DOE approval, its internal safety performance objectives, performance measures, and commitments consistent with and in response to DOE's program and budget execution guidance and direction. Resources shall be identified and allocated to meet the safety objectives and performance commitments as well as to maintain the integrity of the entire System. Accordingly, the System shall be integrated with the Contractor's business processes for work planning, budgeting, authorization, execution, and change control.

- f) The Contractor shall comply with, and assist DOE in complying with, all applicable laws, regulations, and DOE Directives. The Contractor shall cooperate with regulatory authorities having jurisdiction over ES&H matters under this contract.
- g) The Contractor shall promptly evaluate and resolve any noncompliance with applicable ES&H requirements and the System. If the Contractor fails to provide resolution or if, at any time, the Contractor's acts or failure to act cause substantial harm or an imminent danger to the environment or health and safety of employees or the public, the Contracting Officer may issue an order stopping work in whole or in part. Any stop work order issued by a Contracting Officer under this clause (or issued by the Contractor to a subcontractor) shall be without prejudice to any other legal or contractual rights of the government. In the event that the Contracting Officer issues a stop work order an order authorizing the resumption of the work may be issued at the discretion of the Contracting Officer. The Contractor shall not be entitled to an extension of time or additional fee or damages by reason of, or in connection with, any work stoppage ordered in accordance with this clause.
- h) The Contractor is responsible for ensuring compliance with the ES&H requirements applicable to this contract at the facilities identified in Clause 6.1, Laboratory Facilities, regardless of the performer of the work. To the extent permitted by law, this paragraph is not intended to attribute any liability to the Contractor in the absence of a specific finding of fault on the part of the Contractor.
- i) The Contractor shall include a clause substantially the same as this clause in subcontracts involving complex or hazardous work on-site at a DOE-owned or DOE -leased facility. Such subcontracts shall provide for the right to stop work under the conditions described in paragraph (g) above. Depending on the complexity and hazards associated with the work, the Contractor may require that the subcontractor submit a Safety Management System for Contractor's review and approval.

B. Clause 5.5—The Compliance Requirements DEAR Clause

This clause is derived from 48 CFR 970.5204-78. This clause is the foundation of WSS.

CLAUSE 5.5—DEAR 970.5204-78

Laws, Regulations, and DOE Directives (June 1997) (Modified)

- (a) In performing work under this contract, the Contractor shall comply with the requirements of applicable federal, state, and local laws and regulations, unless relief has been granted in writing by the appropriate regulatory agency.
- (b) In performing work under this contract, the Contractor shall comply with the requirements of those DOE Directives, or parts thereof, identified in the List of

Applicable Directives (List) referred to in Appendix G, DOE Directives. The Contracting Officer may, from time to time and at any time, revise the List by unilateral modification to the contract to add, modify, or delete specific requirements; provided, however, that no directive added to the List shall in any manner modify the rights and obligations of the parties except as set forth elsewhere in this contract.

- (c) Prior to revising the List, the Contracting Officer shall notify the Contractor, in writing, of DOE's intent to revise the List and provide the Contractor with the opportunity to:
 - 1) Assess the effect of the Contractor's compliance with the revised List on contract cost and funding, technical performance, and implementation schedule for directives on the List; and
 - 2) Identify any potential inconsistencies between the revised List and the other terms and conditions of the contract, including an alternative set of requirements incorporated by reference in accordance with paragraph (f) below.
- (d) Within 30 days after receipt of the Contracting Officer's notice, the Contractor shall advise the Contracting Officer, in writing, of the potential impact of the Contractor's compliance with the revised List, including the matters identified in paragraph (c) above.
- (e) Based on the information provided by the Contractor and any other information available, the Contracting Officer shall decide whether to revise the List, and so advise the Contractor not later than 30 days prior to the effective date of the revision of the List. The Contractor and the Contracting Officer shall identify and, if appropriate, agree to any changes to other contract terms and conditions, including cost and schedule, associated with the revision of the List pursuant to Clause 5.6, Changes. No DOE directive shall be considered a requirement of this contract unless it has been included in the List in accordance with the procedures set out in this clause.
- (f) Environmental, safety, and health (ES&H) requirements applicable to this contract may be determined by a DOE approved process to evaluate the work and the associated hazards and identify an appropriately tailored set of standards, practices, and controls, such as a tailoring process included in a DOE approved Safety Management System implemented under Clause 6.7, Integration of Environment, Safety, and Health into Work Planning and Execution. When such a process is used, the set of tailored ES&H requirements, as approved by DOE pursuant to the process, shall be incorporated into the List as contract requirements with full force and effect. These requirements shall supersede, in whole or in part, the contractual environmental, safety, and health requirements previously made applicable to the contract by the List.

- (g) The Contractor shall be responsible for compliance with the requirements made applicable to this contract, for work performed at the Laboratory regardless of the performer of the work. Consequently, the Contractor shall be responsible for flowing down the necessary provisions to subcontracts at any tier to which the Contractor determines such requirements apply.

C. Summary for Superblock Work Control Process

The Superblock consists of three non-reactor nuclear facilities – B331, B332, and B334. Although not located within the Superblock, the Radiography Facility (B239) also uses the Superblock work control process. Building 332, the Plutonium Facility, is designated as a Nuclear Hazard Category 2 facility. Building 331, the Tritium Facility is designated as a Category 3 nuclear facility, as is Building 334. Building 239, the Radiography Facility, is also designated as a Category 3 nuclear facility. Each of the four facilities has an assigned Facility Manager. The discussion that follows describing the Superblock work control process applies to B239 although it is not specifically mentioned each time and it is not physically located within the Superblock. It is situated immediately adjacent to the Superblock.

Element Summary

The five core safety management functions provide the necessary structure (as essential to planning and performing hazardous work safely) for any Superblock work activity that could potentially affect the public, the worker, and the environmental.

For the Superblock facilities, the intent of the IWS process is achieved through a structured work control/change control process tailored to each specific facility. The USQ process is implemented through the ISMS/Work Control/Design Change Control Process.

ISMS/Work Control/Design Change Control Process

The activities in each of the work categories defined for the Superblock facilities will be performed in a deliberate manner with an emphasis on safety and in accordance with the five core functions of ISMS:

- 1) Define the work
- 2) Analyze the hazards
- 3) Control the hazards
- 4) Perform the work
- 5) Provide feedback and improve the process

Define the Work

Work packages for activities are developed using a graded approach. At a minimum, a package is developed identifying who is conducting the work, title of the activity, location of the activity, a general discussion of the activity, and identification of the anticipated hazards. Some of the activities are performed in accordance with the facility FSP, procedural guidance, or program direction. Some of the activities require a detailed work package including work instructions, post work instructions, and a materials list.

Work Categories. The respective Facility Managers approve and control all work activities conducted in the Superblock Facilities. The work control process is based on a graded approach. The level of detail in each of the steps is commensurate with the complexity of the work and associated hazards involved, i.e., there is less rigor in the Category 3 facilities than the Category 2 Plutonium Facility.

Not all activity categories apply to all of the Superblock facilities. Currently the Category 3 facilities only use three categories of work activities. The Category A and B activities are similar to B332, whereas the Category C activities are a combination of the Category C and D activities addressed below.

Category A Activities. These include routine, low-hazard activities that require little or no coordination and have a low probability of impacting facility operations. Personnel who perform these activities have specific guidance documentation, controls, and training to perform such activities in a safe and efficient manner. No further review or approval is required upon completion of the tasks involved.

Category B Activities. These include activities that have been reviewed and pre-authorized and have the potential to impact facility operations or other groups or require coordination. The hazards and controls associated with these activities are adequately addressed in the FSP. Additionally, personnel have specific guidance documentation and training to perform these tasks.

These activities are placed on the appropriate facility activity list for review and approval prior to being performed to ensure the work has the appropriate authorization and effective coordination between facility and programmatic support personnel.

Category C Activities. These activities are programmatic support activities that have been analyzed to determine their potential hazards. These activities may impact facility operations or other programmatic activities.

These activities require an OSP or an IWS/SP and must be placed on the appropriate facility activity list for review and approval prior to being performed. The purpose of the review is to ensure that the activities are coordinated with others performed in the facility, verify facility conditions, and assess the impact that these activities may have on other operations.

Category D Activities. These include activities controlled by neither an FSP nor an OSP. These activities include corrective maintenance of building safety systems, or other building systems, and programmatic equipment. These activities must be placed on the appropriate facility activity report for review and approval prior to being performed. The purpose of the review is to determine the potential hazards and controls necessary to mitigate those hazards, verify facility conditions, and coordinate the activities for approval through the facility activity scheduling process.

Category E Activities. These activities include modification to equipment or the introduction of new equipment or processes. These activities require a hazards analysis as part of the Facility Engineering Design Review (FEDR) process used to develop a Design Change Package (DCP) Category E activities require a Work Request and a Work Permit must be placed on the appropriate activity list for review and approval prior to being performed.

Analyze the Hazards

Based on the work-scope statement, the originator, with assistance from the facility staff, operators, and ES&H Team 1, will identify the hazards associated with the proposed activity. This is often an iterative process wherein the parties involved discuss the activity and conduct walkdowns to ensure that everyone has a thorough understanding of the activity and its potential hazards.

Develop Controls

Three types of controls are used to mitigate hazards identified through a hazard analysis or Facility Engineering Design Review: personal protective equipment, administrative controls, and engineered controls. Of these, engineered controls are the most effective and are the preferred method for controlling hazards; PPE is the least effective. Hazards associated with new or modified equipment or processes will be compared to those already identified for facility operations to determine the adequacy of controls specified. A USQ will be prepared for proposed changes to equipment or processes to determine if the change is outside the authorization basis.

Perform the Work

Category A, B, and C work activities must be conducted in accordance with the guidance given in the appropriate sections of the facility FSPs or the respective OSP, SRP, or operating procedure. Some activities must be placed on the facility activity list for review and approval before the work can start

The workers perform work within the identified controls. Every worker has the right to refuse to start a task that is considered unsafe by the worker. While performing tasks, the workers and/or the job supervisor should immediately stop work if unsafe conditions arise and the situation should be immediately be reported to the Facility Manager.

Provide Feedback

Several mechanisms are available to employees to provide feedback to correct deficiencies and improve the work process such as Corrective Action Reports (CARs), as well as IWSs and work control documents; e.g. work permits. The use of an IWS is optional in Superblock.

Corrective Action Report (CAR). Personnel can use the CAR system to identify documentation, processes, or material deficiencies and forward them to the Nuclear Materials Technology Program (NMTP) Assurance Manager for screening. The NMTP Assurance Manager will review the items, and then forward them to the appropriate Facility Manager who will assign each to the appropriate facility person for corrective action.

The CAR system may be used at any time to report ES&H, facility, or programmatic issues that require facility management attention. The CAR process is intended to be a reporting mechanism as well as a tracking system for facility issues requiring corrective action.

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TBD