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Program Description Document

Integrated Safety Management System

Idaho National Laboratory

The INL is a U.S. Department of Energy National Laboratory operated by Battelle Energy Alliance.

ACRONYMS

AEMS	Applied Engineering Management System
AFA	Abbreviated Fire Assessment
AFP	Approved Funding Program
ALARA	As-Low-As-Reasonably-Achievable
ALD	Associate Laboratory Director
ANL-W	Argonne National Laboratory - West
ATP	Annual Training Process
BBWI	Bechtel BWXT Idaho, LLC
BEA	Battelle Energy Alliance, LLC
CAES	Center for Advanced Energy Studies
CARB	Corrective Action Review Board
CCR	Competence Commensurate with Responsibility
CFR	Code of Federal Regulations/ Contractor Field Representative
CTR	Charter
CRADs	Criteria and Review Approach Documents
CWI	CH2M-WG Idaho
D&D	Decontamination and Decommissioning
DEAR	Department of Energy Acquisition Regulation
DOE	Department of Energy
DOE-ID	Department of Energy - Idaho Field Office
DSA	Documented Safety Analysis
eDOCS	Electronic Document Management
EM	Environmental Management
EMS	Environmental Management System
ES&H	Environment, Safety, and Health
ESH&Q	Environment, Safety, Health and Quality
EST	Employee Safety Team
FHA	Fire Hazard Analysis
FM	Facility Manager
FORIB	Facility Operation Review and Implementation Board
FSA	Fire Safety Analysis
FSM	Functional Support Manager
FY	Fiscal Year
GDE	Guide
HA	Hazards Assessment
H&R	Hoisting and Rigging
HaRPs	Hazard and Risk Planning System
HPI	Human Performance Initiative
HRC	Hoisting and Rigging Committee
HS	Hazards Survey
IAG	Interface Agreement
IAP	Integrated Assessment Program
IBRC	Indirect Budget Review Committee
ICARE	Issue Communication and Resolution Environment
ICP	Idaho Cleanup Project
INEEL	Idaho National Engineering and Environmental Laboratory
INL	Idaho National Laboratory
IPMAS	Integrated Performance Management and Assurance System
IRB	Infrastructure Review Board
IRC	Independent Review Committee
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
ISSM	Integrated Safeguards and Security Management
ISO	International Organization for Standardization
IT	Information Technology
ITP	Individual Training Plan
JSA	Job Safety Analysis
LPAG	Laboratory Performance Analysis Group
LEP	Laboratory Excellence Program
LEST	Laboratory Employee Safety Team
LLC	Limited Liability Company
LMT	INL Senior Leadership-Management Team
LRD	Laboratory Requirements Document
LTHC 3	Less Than Hazard Category 3
LWBS	Laboratory Work Breakdown Structure
LWP	Laboratory-wide Procedure
LTRIB	Laboratory-wide Training Review and Implementation Board
M&O	Management and Operating
MCP	Management Control Procedure
MFC	Materials and Fuels Complex
MSD	Management System Description
NE-HQ	Office of Nuclear Energy – Headquarters
NFM	Nuclear Facility Manager
NFPA	National Fire Protection Association
NS	Nuclear Safety
NSE	Nuclear Safety Engineering
OE	DOE Office of Price-Anderson Enforcement
OSB	Operational Safety Board
OSR	Operational Safety Requirement
OSHA	Occupational Safety and Health Administration

PAAA	Price-Anderson Amendments Act
PCS	Project Control System
PD	Position Description
PDD	Program Description Document
PEMP	Performance Evaluation Measurement Plan
PEP	Project Execution Plan
PFC	Planning and Financial Controls
PLN	Plan
PMO	Project Management Office
PO	Performance Oversight
POL	Policy
PPE	Personal Protective Equipment
PRD	Program Requirements Document
QA	Quality Assurance
QAP	Quality Assurance Program
R&D	Research and Development
RCRA	Resource Conservation and Recovery Act
RD	Requirements Document
RD&D	Research, Development, and Demonstration
RM	Requirements Management
RMS	Requirements Management System
RTC	Reactor Technology Complex
S&S	Safeguards and Security
S&T	Science and Technology
SAR	Safety Analysis Report
SAT	Systematic Approach to Training
SER	Safety Evaluation Report
SFG	Subcontract Formation Group
SIMS	Systems Integrating Management System
SMC	Specific Manufacturing Capability
SME	Subject-Matter Expert
SOAR	Safety Observations Achieve Results
SPOMC	Safety Performance Objectives, Measures, and Commitments
SRM	Subcontractor Requirements Manual
SSC	Structure, System, Component
STA	Subcontract Technical Authority
STC	Science and Technology Campus
STD	Standard
STR	Subcontract Technical Representative
TPR	Technical Procedure
TSR	Technical Safety Requirement
TUA	Tenant Use Agreement
USQ	Unreviewed Safety Question
VPP	Voluntary Protection Program

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1. INTRODUCTION

1.1 Purpose and Scope

This program description document (PDD) describes the Idaho National Laboratory (INL) Integrated Safety Management System (ISMS) designed for the protection and safety of the workers, the public, and the environment. Department of Energy Acquisition Regulation (DEAR) Contract Clause I.22, 48 Code of Federal Regulations (CFR) 970.5223-1, requires the ISMS, and that requirement has been incorporated into Management and Operating (M&O) Contract DE-AC07-05ID14517 for the Laboratory. The ISMS also is a requirement of subcontractors who perform work for the M&O contractor. It does not apply to non-M&O contractor-operated facilities, tenant federal agencies, or other federally operated facilities. Battelle Energy Alliance, LLC (BEA) manages and operates the INL and is committed to the implementation of an ISMS that fulfills the requirements contained in the M&O contract and accomplishes safe and efficient performance of work.

1.2 Laboratory Mission, Vision, and Strategic Objectives

The mission of the INL is to ensure the nation's energy security with safe, competitive, and sustainable energy systems and unique national and homeland security capabilities.

The vision for the INL is – *to become the preeminent nuclear energy laboratory with synergistic, world-class, multiprogram capabilities and partnerships by 2015*. The INL's principal priorities are:

- World-leading safety behavior, safety performance, and environmental stewardship
- Respect and caring for our people
- Mission accomplishment

The INL Strategic Plan (INL/EXT-05-00739) presents the strategic objectives that will transform the INL during the next decade. The strategic objectives essential to delivering the INL vision are defined in five areas:

- Building our nuclear energy leadership by partnering with DOE, industry, universities, and the international community to provide technical and programmatic leadership and perform key research and development to support the global nuclear energy renaissance.
- Building our national and homeland security leadership by leveraging our scientific expertise, engineering discipline, and unique infrastructure to identify and defeat threats to the nation's critical infrastructures and reduce risks associated with the illicit proliferation of nuclear materials and technologies.
- Focusing our multiprogram science and technology portfolio on energy security by contributing scientific research and innovations in science and technology that address international energy policy challenges and America's current and future energy security.
- Developing our supporting science and engineering capabilities and ensuring a vibrant U.S. nuclear workforce by establishing five distinctive scientific signatures;

enhancing our strong engineering base; revitalizing U.S. nuclear science and engineering education and training; and creating resource networks among industry, academia, and national laboratories.

- Enabling the strategy by addressing foundational needs for excellence in safe, secure, high quality, and responsible environmental operations; revitalized human, physical and management system infrastructures; and enhanced public trust and confidence.

Strategic partnerships support all areas of the multiprogram laboratory and provide cost effective means to accomplish the INL mission – *to ensure the nation's energy security with safe, competitive, and sustainable energy systems and unique national and homeland security capabilities.*

1.3 Recent ISMS History at the INL

In February 2005, the INL was created as a multiprogram laboratory with a mission of leading the renaissance in nuclear energy for the United States. Two existing national laboratories, Argonne National Laboratory-West (ANL-W) and the Idaho National Engineering and Environmental Laboratory (INEEL), each with different legacies but connected with the bond of science and engineering achievements, were merged into one. To ensure fulfillment of its newly assigned role, INL's path forward was defined in three phases: transition, consolidation and transformation.

Transition occurred from November 9, 2004, to January 31, 2005. This involved a systematic turnover of employees, facilities, operations, and programs from the former M&O contractors for ANL-W and INEEL to the new M&O contractor for the INL.

Consolidation began on February 1, 2005 and ended on September 30, 2005. The research and development and science and technology arms, including nuclear facilities and operations, of the former INEEL and the former ANL-W were combined. The successful integration—spanning personnel, facilities, equipment, procedures and controls, and management and business systems—produced the foundation for the transformation of the INL.

Transformation—the enduring phase of INL's strategic evolution—began October 1, 2005. The INL vision is to become, in 10 years' time, the preeminent nuclear research, development, and demonstration Laboratory.

At the INL, the ISMS has been on a parallel path of transition, consolidation, and transformation. System transition was complete as of February 1, 2005. The INL obtained Department of Energy Idaho Operations Office (DOE-ID) approval for the two former laboratories' ISMS description documents so that the consolidation could begin with validated systems in place. System consolidation was completed September 30, 2005. The challenge this year has been to combine two previously validated but different systems from the two laboratories into one new ISMS, using the best of each. Consolidating the two systems required a determined focus and a disciplined approach, as addressed in revision 8 of this document. The ISMS transformation, which had already begun for some key processes, continues to improve and shape the system to fully and efficiently support the new mission of the INL. One thing that will <u>not</u> change is the

commitment to the safe conduct of all work, ensuring the health and safety of the workers and the public, and the protection of environment.

The Laboratory was further challenged by additional contract changes that occurred on the INL Site during a 4-month period starting on February 1, 2005 - and continuing today. These significant changes have impacted the entire INL workforce:

- The Idaho Cleanup Project (ICP) was formed to complete the environmental cleanup portion of the former INEEL mission.
- The former INEEL M&O contractor, Bechtel BWXT Idaho, LLC, (BBWI) held the ICP contract from February 2005 through May 2005.
- The 7-year contract for the ICP was then awarded to CH2M-WG Idaho (CWI), LLC in May 2005.
- Bechtel BWXT Idaho, LLC took over operation of the Advanced Mixed Waste Treatment Project (AMWTP) from British Nuclear Fuels plc in May 2005.

1.4 INL Transformation

INL's strategy commits the Laboratory to make important contributions in nuclear energy, national and homeland security, and science and technology. As a consequence, BEA is transforming the leadership, infrastructure, culture, processes, citizenry and customer interface. Transformation changes will result in better innovation, increased productivity and a better environment in which to work. When transformation is completed in 2008, world-class management systems will be in place.

How will this be accomplished? It begins with the transformation of functional support areas to management systems so the focus of process identification is geared toward accomplishing work while remaining compliant with customer's requirements. Business tools, procedures and processes will be aligned to better accomplish our strategic research and development mission. This also entails modifying the job expectations of all employees - scientists, engineers, technicians, craft workers and support staff - so all work is tied to the new strategic research and development vision.

The leadership of the Laboratory Systems Transformation Office has identified how BEA will dramatically change the current approach to management of the INL - while continuing to meet customer requirements. A primary objective of the Transformation Office is to transfer the Battelle experience, knowledge and insights in laboratory management to INL and its work force.

The INL must demonstrate leadership in safety management for all organizations on the Site because it represents the enduring mission and operations at the Site. The Laboratory Director has stated that the INL must set the bar for world-class safety management—to ensure protection of our employees, the public, and the environment and to sustain public trust to build a national laboratory that inspires our people, intensifies and accelerates our research, and directly enhances our many achievements.

Leadership and direction for the INL ISMS transformation is the responsibility of the Senior Management Review Board (SMRB), which operates under the purview of the

Operations Council. Chaired by the Deputy Laboratory Director for Operations, the SMRB provides senior management leadership and strategic direction for implementation of the ISMS. (Refer to section 3.6.1.1)

1.5 Document Organization

This document is organized to provide a comprehensive structure of BEA's ISMS with the core functions and guiding principles as the foundation. The core functions and guiding principles of Integrated Safety Management (ISM) are implemented at three levels within BEA – Laboratory level, facility level, and activity level. The sections of the ISMS Description Document that lend themselves to being organized according to those levels are written to reflect that implementation strategy. The BEA work scope is very broad and includes a multitude of hazards associated with that work. Organizing the sections (in particular Section 7 "Integration of Safety Into Work,") to reflect the work levels also helps to clarify for the reader the broad work scope and to understand how that scope is managed at all levels.

The laboratory's organization structure and how it implements the ISMS is described in Sections 1, 3, 4 and 5, including descriptions of the integrating methods used within the system. Section 2 provides an overview of INL's ISMS. Section 6 describes BEA business, budgets and contracts process. Section 7 describes how safety is integrated into the work at the laboratory level, at the facility level, and at the activity level. Section 8 describes the system for maintaining the ISMS current.

2. ISMS OVERVIEW

The objective of the ISMS is to provide a safe workplace in which to perform work while protecting the worker, the public, and the environment. "Safety" for the purposes of this PDD, and in response to Contract Clause I.22, encompasses ESH&Q, including pollution prevention and waste minimization. The interfaces of these programs with ISMS are illustrated in Figure 1.

The INL – BEA – was designated a DOE-VPP Star Site on June 1, 2006. Laboratory requirements document (LRD) -14004, "Requirements for the Voluntary Protection Program Star Process at the INL," documents the basic programmatic elements of the VPP program.

In accordance with 10 CFR 830 Subpart A and DOE O 414.1C, INL has developed a Quality Assurance Program that is fully integrated with ISMS. The Quality Assurance (QA) processes are vital for ensuring that work is performed safely and to required codes and standards. PDD-13000, "Quality Assurance Program Description," describes the QA Program and its integration with ISMS.

DOE P 450.4 established seven guiding principles for a strong ISMS. INL identified an eighth guiding principle, employee involvement, considered a key ingredient to the INL ISMS implementation strategy success. These eight guiding principles and the five core functions are the foundation for which work is performed. The key INL ISMS processes are ingrained with these basic tenets.

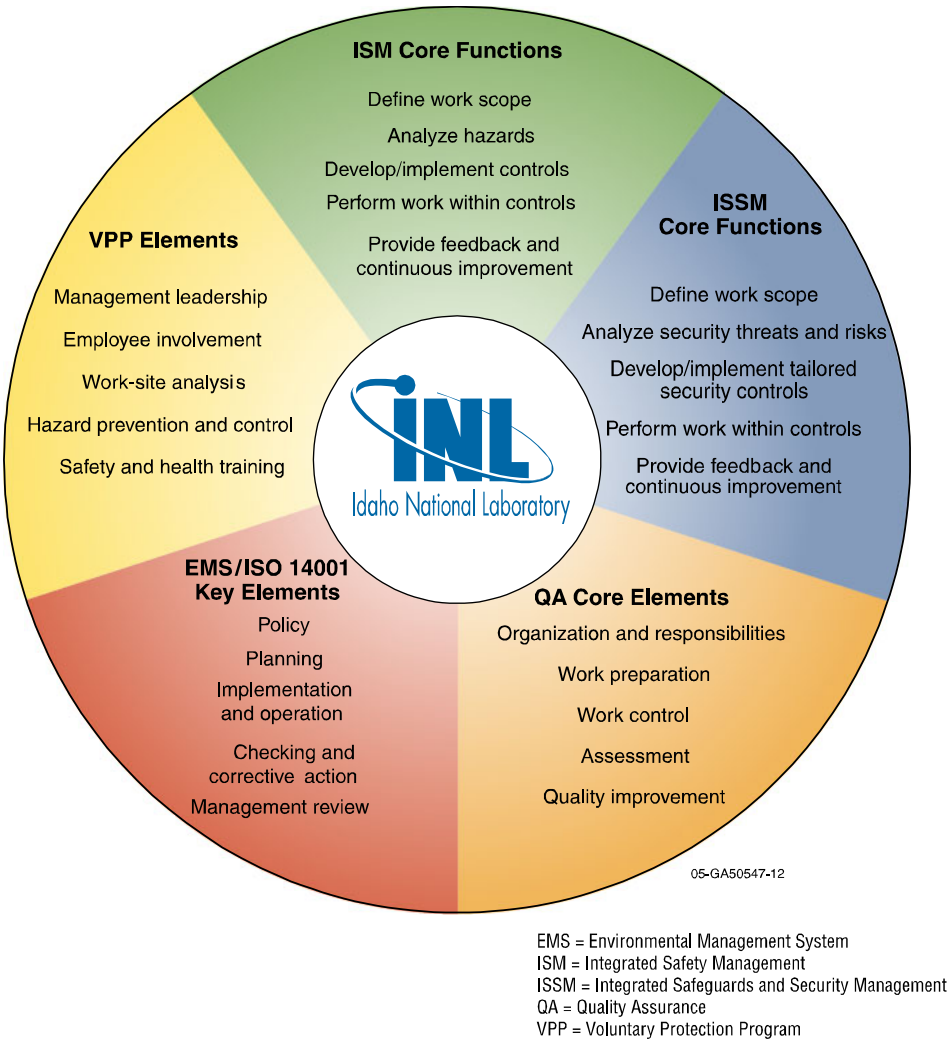


Figure 1. Interfaces of EMS, VPP, QA, and ISSM with ISM.

Figure 2 illustrates the relationship between the ISMS guiding principles and the core functions with respect to the three work levels. The guiding principles become more significant at the laboratory level – establishing the infrastructure whereby work can be performed safely at all levels (e.g., balanced priorities, clear roles and responsibilities, competence commensurate with responsibilities). Using this safety infrastructure supports work being performed safely at the activity level.

The eight BEA ISMS Guiding Principles are:

- **Line Management Responsibility for Safety.** Line management is responsible for the safe and efficient conduct of work to ensure the protection of the public, the workers, and the environment.
- **Clear Roles and Responsibilities.** Clear and unambiguous lines of authority and responsibility for ensuring safety are established and maintained at all organizational levels.

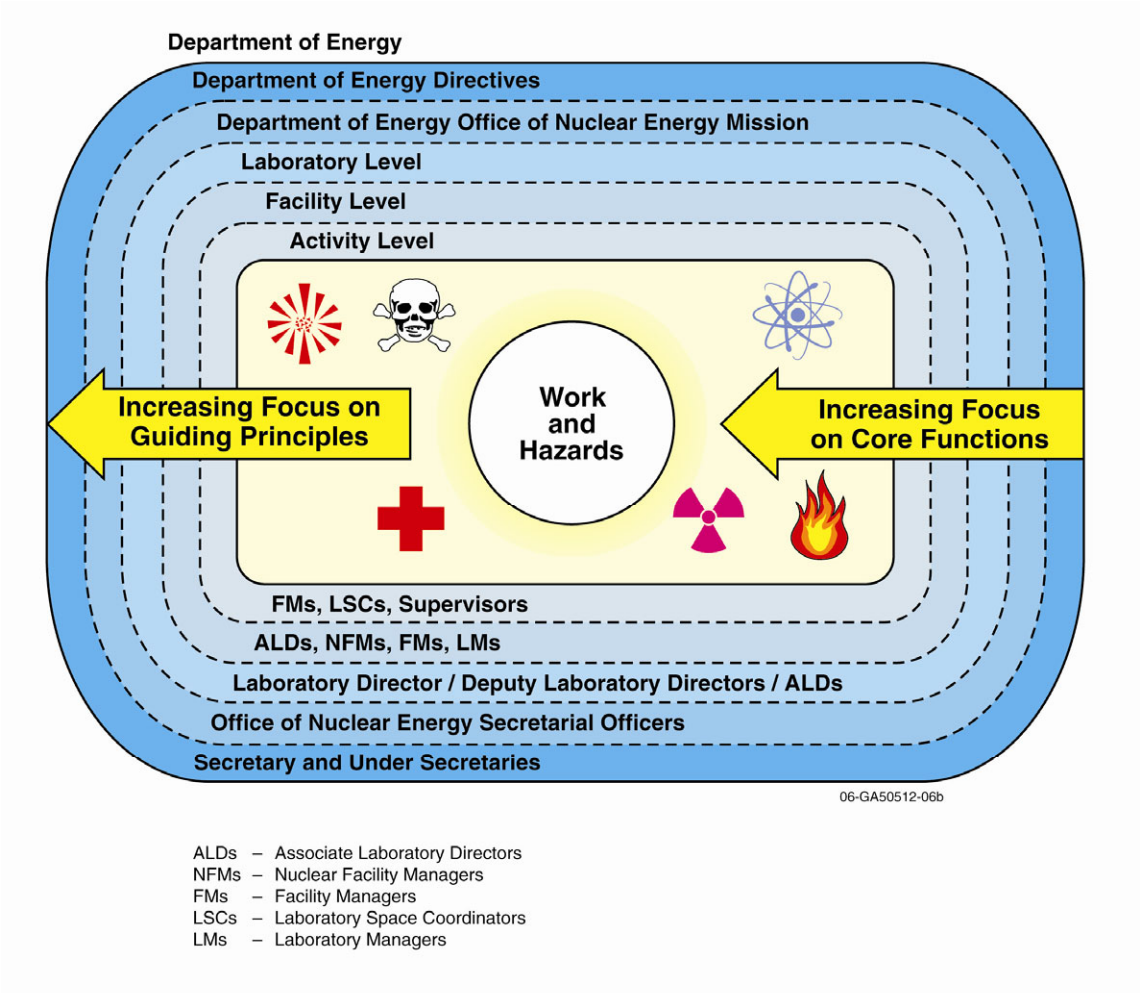


Figure 2. Relationship between Guiding Principles and Core Functions.

- **Competence Commensurate with Responsibilities.** Personnel possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.
- **Balanced Priorities.** Resources are effectively and adequately allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment is a priority whenever activities are planned and executed.
- **Identification of Safety Standards and Requirements.** Before work is performed, the associated hazards are evaluated, and standards and requirements are established that, when properly implemented, provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.
- **Hazard Controls Tailored to Work Being Performed.** Engineered and administrative controls to prevent and mitigate hazards are integrated and tailored to the work and associated hazards.
- **Operations Authorization.** The conditions and requirements to be satisfied for operations to be initiated and conducted are clearly established and agreed upon.

- **Employee Involvement.** Execution of the ISMS is focused where work is executed – at the laboratory level, the facility level, and the activity level. Line management direction and ownership, employee input and support, and effective processes are present to ensure success of the ISMS.

The framework for the ISMS is organized around the following five Core Functions:

- Define the scope of work
- Analyze hazards associated with the work
- Develop and implement hazard controls
- Perform work within controls
- Provide feedback and continuous improvement.

The five core functions provide a distinct, phased approach in the continuing cycle of conducting safe work.

3. LABORATORY ORGANIZATION STRUCTURE AND FACILITIES INFRASTRUCTURE

3.1 Management Structure

The management structure utilized by BEA as the M&O contractor at the INL is detailed in PDD-9000, "Laboratory Excellence Program and Organization Structure," and is a key component of the ISMS. PDD-9000 identifies line management and functional management structures, summarizes their roles and responsibilities, and outlines interfaces between them. The roles, responsibilities, and processes described in PDD-9000 apply to all INL organizations and personnel.

Supporting the Laboratory Director and Deputy Directors with Contract Assurance, the INL organization consists of five Level 1 technical directorates responsible for Mission Accomplishment:

- Science and Technology
- Nuclear Programs
- National and Homeland Security
- Nuclear Operations
- Specific Manufacturing Capability.

The following five Level 1 support directorates are responsible for Mission Support and Assurance:

- Business Management
- Environment, Safety, Health, and Quality
- Communications
- Facilities and Site Services
- Human Resources and Diversity Programs.

In addition to the mission and support organizations, the following Level 1 staff functions provide Cross-cutting Mission Support and Collaborative Partnerships:

- Center for Advanced Energy Studies (CAES)
- Education, Training and Research Partnership
- Technology Partnerships
- Strategic Planning
- Infrastructure, Optimization, Integration, and Planning
- Legal
- Audits.

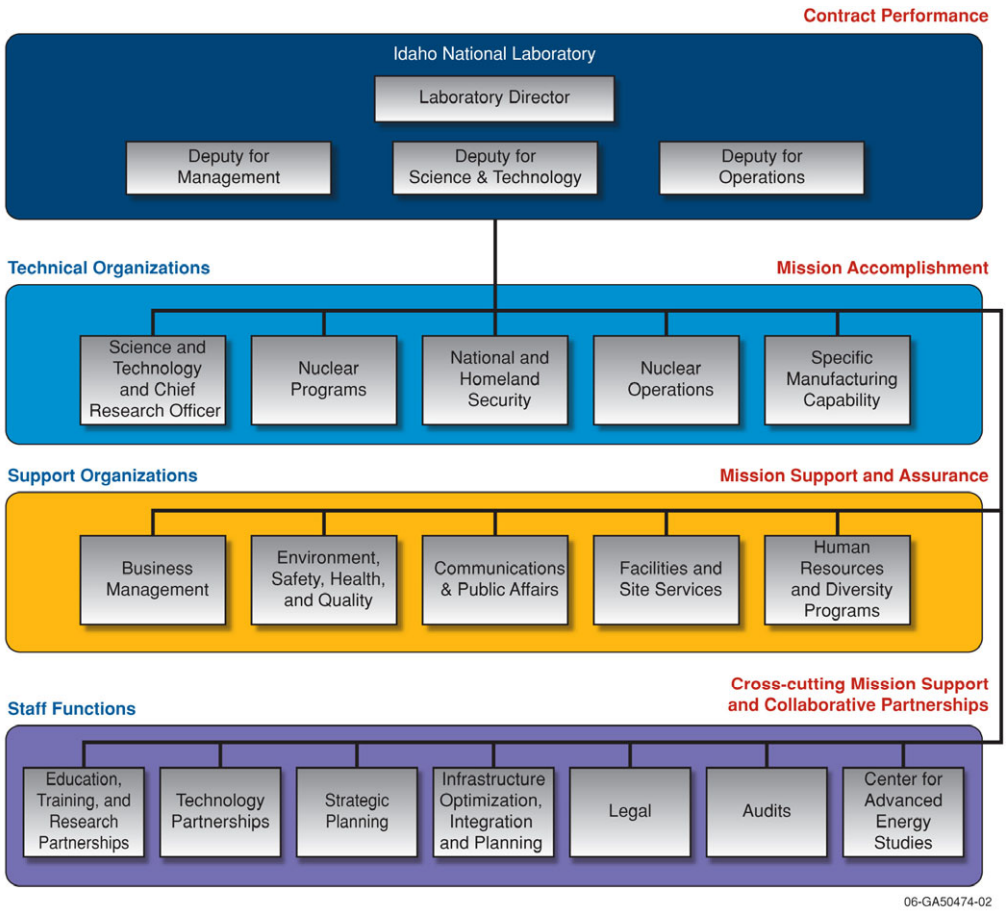


Figure 3. INL organizational structure.

The INL organizational structure is discussed and illustrated in PDD-9000, "Laboratory Excellence Program and Organization Structure." Organization charts, indicating BEA's management structure from the Laboratory Director down through facilities, can be found on the INL intranet website homepage.

3.2 Laboratory Facilities Infrastructure

The transformation to a new INL required the consolidation of two former national laboratories: ANL-W and the INEEL. INL consists of an 889-mi^2 area in southeastern

Idaho typically referred to as the "Site," along with laboratories and administrative buildings located approximately 30 mi east of the Site in the city of Idaho Falls.

Part of the laboratory transformation included assigning new names to key facilities and areas to reflect both the important INL missions being accomplished today and the vision for the future. The four major complexes composing INL are listed below.

Materials and Fuels Complex (MFC). Formerly ANL-W, MFC is the prime testing center in the United States for demonstration and proof-of-concept of nuclear energy technologies. MFC has great importance as the nexus of research and development (R&D) for new reactor fuels and related materials. In that role, it will contribute increasingly efficient reactor fuels and the important work of nonproliferation-harnessing more energy with less risk.

Reactor Technology Complex (RTC). Formerly the Test Reactor Area, RTC is the home of the Advanced Test Reactor (ATR), the world's premier test reactor. The ATR is used to study the effects of radiation on materials, and produces rare and valuable medical and industrial isotopes. The RTC facility will be the focal point for designing, testing and proving the new technologies of the nuclear renaissance. The new mission is broader, more far-reaching and encompasses a larger scope involving multiple technological options available to be part of coming generations of nuclear power reactors.

Science and Technology Campus (STC). The Science and Technology Campus is a collective name for INL's in-town facilities. STC is a name indicative of both basic science research and the engineering that translates new knowledge into products and processes that improve the quality of life. This reflects the emphasis that INL is placing on strengthening its science base and increasing the commercial success of its products and processes. The Campus currently supports R&D for government agencies, private companies, universities, and nonprofit organizations. More than 350 researchers perform R&D work in 60+ different laboratories. Research takes place in various disciplines including nuclear science, biotechnology, intelligent automation and remote systems, materials processing, chemical separations and processing, and sensing and diagnostics.

Specific Manufacturing Capability (SMC) facility. The SMC facility, part of Test Area North, houses the SMC Project. The SMC Project is classified and develops specific manufacturing capabilities as directed by the Department of Defense.

Site-wide Area. The site-wide area is a collective name for INL's physical site facilities and grounds not included in the above complexes.

3.3 Services

The INL consists of multiple contractors with different missions but with some shared services. For this reason, service agreements across INL contractors are addressed to ensure successful and cost-effective mission accomplishment.

The hazard identification, analysis, and control discussion, together with Figure 17a, illustrates the vertical integration of safety management into INL organizations down to the activity level. How ISM horizontally integrates with the Site's Environmental

Management (EM) contractor also is important. Development of INL as a world-class national laboratory is dependent not only on the INL's nuclear energy mission, but also on the success and closure of the INL's EM mission. Further, based on demand and availability, shared services are provided across contractor boundaries. Examples include Chemical Management Services, Waste Management Services, and Occupational Medicine.

An overarching Interface Agreement (IAG) IAG-349, "Integrated Agreement for Site Services and Site Service Agreements," between BEA and CWI establishes the general protocol for interface between the two contractors. In this agreement, BEA and CWI have agreed that each company, in providing services to the other, will meet the other's standards. Individual service agreements (SAs) have been established between the two contractors for site services categorized as mandatory, other, and miscellaneous.

Mandatory Site Services BEA provides to CWI include fire department and emergency management (IAG-271), occupational medical program (IAG-272), information technology infrastructure (IAG-273), on-site monitoring activities (IAG-274), landfill and waste disposal (IAG-275), power management (IAG-276), life safety systems (IAG-277), bus services (IAG-278), laboratory directed research and development (IAG-279), calibration services (IAG-280), electronic document management system (IAG-281), and general infrastructure support for roads and grounds (IAG-282), and safeguards and security (IAG-283),

Other site services provided between BEA and CWI are in accordance with SAs. Specific examples of other site services are mail services (IAG-310), technical library (IAG-312), and graphic design (IAG-289). There are also other miscellaneous services controlled by SAs between BEA and CWI. Specific examples of these are: nuclear safety (IAG-322); radiological control (IAG-323), engineering services (IAG-324), subsurface investigation team (IAG-330), waste generator services (IAG-331), chemical services (IAG-333); environmental compliance support (IAG-337), and document and records management (IAG-338).

Work processes and procedures used to control work supplied by BEA and CWI to each other are described in IAG-349, which states: "The work processes and procedures (including, without limitation, the safety requirements) of the Party responsible for the facility or area in which or for which the services are performed shall govern. Likewise, work control and work release responsibilities will remain with the facility or area manager/operator as appropriate or agreed to in the applicable tenant use agreement."

3.4 Tenant Use Agreement

BEA uses tenant use agreements (TUAs) that help control activities in facilities/buildings where space is shared. TUAs, fully addressed in laboratory-wide procedure (LWP)-9901, "Developing Tenant Use Agreements," are a form of interface agreements and are written when an organization (the tenant) has a need to perform experiments, operations, or work activities within a facility under a different line management organization. Within the limits and boundaries defined in the TUA, the TUA authorizes tenants to perform work activities within the defined boundaries. Using office space at a facility does not require a TUA. If the activity is service-related with no hazardous chemicals, tasks, or work, the

line management and tenant jointly agree that no TUA is required. A TUA ensures that the facility safety basis and operating limits are not exceeded or violated by tenant activities.

3.5 Subcontractor and Vendor Requirements Flowdown

The INL flows down ES&H requirements to its on-site subcontractors and vendors, including all lower tiers. The flow-down requirements are contained in BEA's prime contract, Section I.22, DEAR 970.5223-1 – *Integration of Environment, Safety, and Health into Work Planning and Execution*, which states: "The contractor is responsible for flowing down the ES&H requirements applicable to the contract to subcontracts at any tier to the extent necessary to ensure the contractor's compliance with the requirements. The contractor shall include a clause substantially the same as the DEAR clause in subcontracts involving complex or hazardous work onsite at a DOE-owned or -leased facility."

Recognizing that the functions and principles of the INL ISMS are necessary to perform all work, not only complex and hazardous work, INL uses a graded approach when applying the mechanisms that implement the core functions of the INL ISMS to all on-site subcontractors and vendors. Appendix A, Subcontractor and Vendor Requirements Flow-down Process, depicts how the graded approach is applied based on the complexity and hazards of the subcontractor/vendor scope of work.

The following four distinctions are made with the application of ES&H requirements graded from one level to the next; the implementation of this approach is found in LWP-4002, "Service Acquisitions."

- Professional Services (e.g., instructor in a conference room)
- Commercial Services (e.g., freight delivery)
- Minimal Hazard (e.g., copy machine repair, vending machines)
- Hazardous (e.g., construction).

Initially, all on-site subcontractors who may perform hazardous work are evaluated during the solicitation process. Dependent on the subcontractor's prior safety record, the subcontractor is categorized as "Approved," "Conditionally Approved," or "Not Approved." Depending on that categorization, approval authority can extend up to the Director of ESH&Q. In addition, during the subcontractor's performance period, subcontract language allows INL to terminate the subcontract "for default" based on inadequate ES&H practices. Subcontractor selection and performance is monitored throughout subcontract period of performance in accordance with direction contained in LWP-4002. At the conclusion of the subcontract performance period, a performance evaluation is conducted, which is used to determine eligibility for future work. This information is maintained in the Supplier Performance Evaluation System (LWP-4002, Appendix B).

3.6 INL Councils, Committees, and Boards

Councils, committees, and boards are a key instrument to balance priorities and effectively integrate and coordinate activities across the Laboratory. The INL Leadership-Management Team (LMT) (see Figure 3), functioning in conjunction with the councils, management committees and boards, assures that roles and responsibilities are clearly defined and that implementing mechanisms, such as procedures, are developed for the

discharge of those roles and responsibilities. In addition, they work to exhibit a questioning attitude and constructive criticism that challenges conclusions and assures risk-informed decisions are derived from objective data, test results where appropriate, analysis, and experience.

The cornerstone of ISMS success depends on employee involvement and management commitment. BEA managers at all levels take actions to ensure they and the employees understand the meaning and importance of ISMS. Management is also committed to ensuring employees understand that:

- they are responsible for integrating safety considerations into their work activities, and
- the unified team of management and supervisors levels are committed to providing the resources and processes to enable safety to be integrated into work processes.

BEA has established various forums for soliciting input from all levels of employees and performing oversight of INL operations involving worker safety and protection of the environment. The following leadership/management oversight groups are established to monitor laboratory performance at the system/program level and provide input for continuous improvement to the ISMS. These groups analyze and evaluate performance information they receive and then decide on actions or report risk issues, results, and recommendations to the LMT. The councils for Operations (chaired by the Deputy Laboratory Director for Operations), Science and Technology (chaired by the Director of Strategic Planning), and Business (chaired by the Chief Financial Officer) provide oversight of laboratory performance and disposition recommendations from senior manager analysis and reports. The Infrastructure Review Board sets priorities on infrastructure investments. The hierarchy of the ISMS-related councils, committees and boards is illustrated in Figure 4.

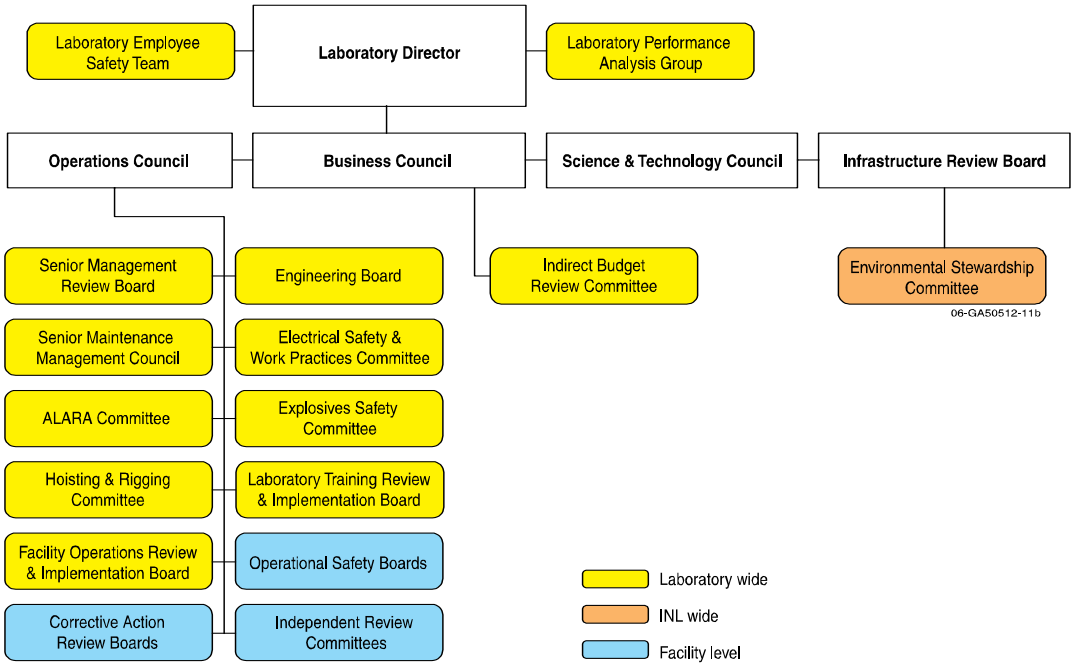


Figure 4. Hierarchy of ISMS-related councils, committees, and boards.

3.6.1 Operations Council

The Operations Council provides advice and recommendations to the INL Laboratory Director, the LMT, and the INL Board of Managers, and provides direction to the operational elements of the Laboratory to ensure that laboratory excellence in the facilities is not only maintained but also continues to improve. In discharging these duties, the focus of the Operations Council is on ensuring effective and timely resolution of operations-related problems and occurrences; the prevention of operational complacency; the prevention of recurrence of operational problems and occurrences; the embracement of lessons learned both from within and external to the Laboratory; and the promotion of an operational culture that embraces human performance in fostering continuous improvement in the operation of the Laboratory. The Operations Council reviews safety management performance [i.e., Safety Performance Objectives, Measures, and Commitments (SPOMC)] and status of key corrective actions. It oversees ISMS implementation through the Senior Management Review Board (SMRB). The Operations Council is chaired by the Deputy Laboratory Director for Operations and is chartered through CTR-900.

3.6.1.1 Senior Management Review Board

The SMRB, operating under the purview of the Operations Council and in accordance with CTR-900B, provides senior management leadership and strategic direction for implementation of the INL ISMS. The SMRB provides leadership for overall programmatic direction and resolution of issues that affect, or are affected by, the implementation of ISM mechanisms within the INL. Responsibility for ensuring and directing effective and compliant institutionalization of ISM in accordance with the DEAR 48 CFR 970.5223-1, *Integration of Environment, Safety, and Health into Work Planning and Execution*, resides with the SMRB. The Board directly interfaces with those INL functional support program managers with responsibility for the implementing mechanisms that comprise the INL ISMS.

3.6.2 Science and Technology Council

The purpose of the Science and Technology Council is to identify and understand issues and to make or recommend decisions in crosscutting areas of science and technology program planning, development and execution, resources, partnerships, and to maintain interfaces with the LMT and other councils and boards. Resources are defined broadly as staffing and staff development, equipment, facilities and other infrastructure, and the development and utilization of centers and hub-node networks that provide resources for the programs. The council oversees implementation of science and technology initiatives and laboratory strategy, including setting laboratory agenda, and implementation of the laboratory management approach. The Science and Technology Council is chartered through CTR-157, “INL Science and Technology Council Charter.”

3.6.3 Business Council

The purpose of the Business Council is to identify and understand issues and to make or recommend decisions to the LMT in crosscutting areas of business management, business systems, business operations, information technology and computer networks, human resources, diversity, public affairs, legal, CDRL reporting, and economic, leadership, and management development. The Business Council oversees implementation of business management and Human Resources processes, including those key to ISMS (i.e., ES&H, budgeting, project management, and procurement). The Business Council is chartered through CTR-1001.

3.6.4 Infrastructure Review Board

The Infrastructure Review Board (IRB) is responsible for transforming and managing Laboratory infrastructure and infrastructure services in a mission-driven, safe, environmentally sound, and efficient manner. The IRB serves as the decision forum to establish infrastructure priorities, arbitrate conflicts, and implement the *INL Ten-Year Comprehensive Site Plan* and Infrastructure Program baseline. The IRB sets priorities on infrastructure investments, ensuring a balance between safety- and mission-related investments. The IRB employs the DOE Management Control System process for planning, budget, execution, and evaluation. The IRB will validate the ten-year mission baseline plans to ensure Infrastructure Program plans are consistent with the laboratory management agenda and advance the infrastructure to satisfy the overarching objective of creating a world-class, multi-program national laboratory. The IRB is chartered through CTR-1002.

3.6.5 Laboratory Performance Analysis Group

The purpose of the Laboratory Performance Analysis Group (LPAG) is to advance execution of INL's strategic and operational objectives through understanding (i.e., identification, analysis, evaluation) and recommending to Councils/LMT actions to address key risks, latent organizational weaknesses, barriers, best practices and lessons learned. In fulfilling its purpose, the LPAG assists implementation of INL's Integrated Performance Management and Assurance System (IPMAS) and provides corporate and contractor assurance. The PAC is comprised of a cross-section of carefully-selected managers who work closely with the Performance Oversight (PO) office to achieve this purpose. The LPAG is sponsored by the Laboratory Director and Deputy Laboratory Director for Management and is chartered through CTR-1003, "Laboratory Performance Analysis Group."

3.6.6 Indirect Budget Review Committee (IBRC)

The Indirect Budget Review Board (IBRC) is a special committee commissioned by the LMT. The IBRC meets once a year for the purpose of: reviewing planned indirect budgets to assure they are in alignment with INL strategic objectives; assuring target affordability is met; and prioritizing budget

requests that exceed recommended targets as submitted by the INL Level 1 Organization Managers (Associate Laboratory and Service Directors). The Board provides recommendations on these items to the INL Laboratory Director for approval prior to finalization of the indirect budget for the fiscal (execution) year. The IBRC is chartered through CTR-5001.

3.6.7 Environmental Stewardship Committee

The Environmental Stewardship Committee, under the IRB and chaired by a representative of the Infrastructure, Optimization, Integration and Planning organization, provides detailed direction and guidance for management of the INL Environmental Management System (EMS). Membership includes representatives from ESH&Q, Facilities and Site Services, Business Management, Communications, Nuclear Programs, Nuclear Operations, Science & Technology, and National & Homeland Security. Additionally, Committee members provide a direct organizational link to the members of the LMT. The Environmental Stewardship Committee is chartered through CTR-193, "Environmental Stewardship Committee."

3.6.8 Engineering Board

The INL Engineering Board provides a vehicle for laboratory engineering managers to discuss and resolve or verify resolution of significant laboratory engineering issues. The Board is a forum for engineering management representing various engineering organizations, and support functions to ensure consistent integration of engineering activities across the Site. The Board ensures that the formulation and implementation of engineering practices for the site are based on best commercial practices and benchmarks and are tailored as required to meet applicable DOE and INL unique requirements. CTR-49, "Engineering Board," establishes and directs the actions of the Board.

3.6.9 Senior Maintenance Management Council

The laboratory Senior Maintenance Management Council (SMMC) recommends policy and provides strategic direction for the laboratory Maintenance Management Program with the objective of achieving continuous improvement in the performance and cost-effectiveness of maintenance, as described in PDD-6000, "Site Maintenance Management Program." The Director of Operations and Maintenance Services champions the achievement of the SMMC's objectives. The SMMC is chartered through CTR-600, "Charter for the Senior Maintenance Management Council."

3.6.10 Laboratory Employee Safety Team

The fundamental purpose of the laboratory employee safety team (LEST) is to engage employees toward the goal of protecting employees and their families from injuries and illnesses, at and away from work. The Employee Safety Teams (ESTs) are an avenue for employees, regardless of level of responsibility in the organization, to contribute to and promote continuous improvement in the safety and health program. The ultimate vision is to prevent injuries and

provide every employee an opportunity to work within a world-class safety culture.

LEST is empowered through CTR-26 to:

- Solicit and encourage employee involvement in, and provide direction to, safety and health programs and awareness activities.
- Develop and submit solutions to leadership-management for laboratory level safety concerns/issues.
- Utilize laboratory level safety and health data, such as injury/illness statistics, Safety Observations Achieve Results (SOAR) observation data, and inspection results to eliminate at-risk behaviors and unsafe conditions. Observation data is equally used to reinforce safe behaviors.
- Establish LEST-specific safety and health goals and action plans annually.
- Serve as the communication pathway between the unit ESTs and the LMT.

3.6.11 ALARA Committee

The INL ALARA Committee provides oversight and support to the INL radiological control ALARA Program, and to the individual facility ALARA Committees consistent with requirements of 10 CFR 835, "Occupational Radiation Protection." The committees serve as multi-disciplined forums that review and advise management regarding occupational radiation exposure. Members of the ALARA Committee are representatives from the organizations that anticipate personnel to receive occupational radiation exposure. The membership includes managers and workers from the line, the technical support organization, and the Radiological Control Organization. The ALARA program reports and tracks ALARA goals and performs ALARA reviews, and establishes the process for evaluating costs and benefits of implementing ALARA protective measures to reduce personnel dose and control radiological contamination. A senior INL manager(s) appointed by the INL Laboratory Director chairs the INL ALARA Committee, which is chartered through CTR-77, "Charter for the INL ALARA Committee."

3.6.12 Electrical Safety and Work Practices Committee

The Electrical Safety and Work Practices Committee provides INL employees with a competent technical resource for guidance concerning implementation of electrical safety and work practice issues. It has responsibility for all aspects of the Electrical Safety Program definition, including ownership of the electrical safety policies, related procedures, and electrical worker qualifications. The committee includes representatives from numerous disciplines and is chartered through CTR-609, "Electrical Safety and Work Practices Committee."

3.6.13 Hoisting and Rigging Committee

The Hoisting and Rigging Committee (HRC) was established to provide the INL with a technical forum for uniform interpretation of Hoisting and Rigging (H&R) activities for cases where clarity of requirements may not exist and to convey those interpretations to INL personnel as appropriate to ensure excellence and continued improvement in hoisting and rigging operations. The

HRC will provide technical and process guidance relative to the application of H&R practices at the INL. The committee decisions, as published by the chairman, will serve as the exclusive interpretation for the INL's execution of the H&R Program as described in LWP-6500, "Hoisting and Rigging Operations," which is based on the DOE Standard Hoisting and Rigging, (DOE-STD-1090). CTR-650, "Hoisting and Rigging Committee" establishes and directs the actions of the HRC which is made up of line management, technical experts and employees.

3.6.14 Explosive Safety Committee

The INL Explosive Safety Committee assists and advises laboratory senior management on technical issues associated with the use of explosives. The committee provides support in the development and implementation of programs, policies, and procedures for the safe use of explosives. The committee is directed by a chairperson that is identified and approved by the INL Director of Safety, Fire Protection, Industrial Hygiene Division and is chartered through CTR-74, "Explosive Safety Committee Charter."

3.6.15 Facility Operations Review and Implementation Board

The INL Facility Operations Review and Implementation Board (FORIB) assists line managers by ensuring that the issuance of and modification to laboratory-wide and project/facility-specific documents are viable, capable of being implemented, and will not adversely impact operations as defined in LWP-1201, "Document Management." The FORIB reviews procedures from the standpoint of the laboratory facilities, areas, and operations, keeping their cognizant director informed of results of their review. It is chartered through CTR-901, "Charter for INL Facility Operations Review and Implementation Board."

3.6.16 Laboratory-Wide Training, Review and Implementation Board

The Laboratory-wide Training Review and Implementation Board (LTRIB) is chartered to review laboratory-wide documents and implementation plans for training requirements. The LTRIB ensures personnel are trained to new or revised laboratory-wide documents prior to issuance. The LTRIB accomplishes this by reviewing the proposed changes and giving concurrence to the appropriateness of training, training delivery, target audience, and the timeline for training implementation. The LTRIB coordinates with the Training and Document Resources Division to ensure effective implementation of required training. The LTRIB is chartered through CTR-16, "Charter for the Laboratory-Wide Training Review and Implementation Board."

3.6.17 Operational Safety Boards

Operational Safety Boards (OSBs) oversee implementation of the line manager's responsibility for safety. Line managers are responsible for the safe execution of work in their facilities, and for ensuring the work is performed within the facility's safety envelope. Various OSBs are established that have

input from several site programs, including but not limited to: the design process; hazard identification and analysis results; laboratory instruction development, review, and approval; the work management process; and startup reviews. LRD-9001, "Operational Safety Boards," identifies the requirements for the development, implementation, and execution of OSBs.

3.6.18 Corrective Action Review Boards

Corrective action review boards (CARBs) and CARB coordinators/cognizant director alternates may be used at the discretion of the cognizant directors to ensure that the Issues Management Program is functioning effectively and efficiently. The cognizant director is the CARB chairperson and assigns membership, including representatives from operations, QA, engineering, and procurement, as desired. The CARB may review assigned issues, cause analysis and extent of conditions determinations, corrective action plans for adequacy and effectiveness, timeliness of issue processing, and review of available performance indicators to identify relevant trends. Facility-specific charters are established to direct the actions of the CARBs.

3.6.19 Independent Review Committees

The Independent Review Committees (IRCs) provide independent oversight and review of Safety Basis Documents associated with 10 CFR 830, Subpart B nuclear facilities and operational activities to ensure attention to safety requirements. Facility-specific charters establish and direct the actions of the IRCs to provide a management-level review of safety analysis documents for Hazard Category 3 and above nuclear facilities of the INL.

4. ISMS INFRASTRUCTURE

Requirements Management (RM) provides a solid mechanism to ensure requirements identification, documentation of implementation methods, and compliance. This function ensures compliance with requirements including ESH&Q requirements, derived from source requirements documents. Compliance with these requirements ensures protection of the health and safety of the workers and the public and the protection of the environment. The RM process includes the following principal elements:

- Maintaining documentation and traceability of requirements from their source to implementing documents
- Communicating applicable requirements to affected organizations and areas for implementation
- Tracking the status of requirement implementation
- Supporting functional support area compliance assessments and audits.

Laboratory-wide procedure (LWP) -1601, "Requirements Management," assigns responsibilities and provides instructions for the INL requirements management process, which is used to direct and maintain traceability of requirements into implementing documents. A flow diagram of the RM process can be found in Appendix B.

Figure 5 illustrates the flowdown of contract requirements into functional area program documents and laboratory work scope. The set of documents illustrated forms the foundation of the implementation of ISMS at the laboratory, facility, and activity levels.

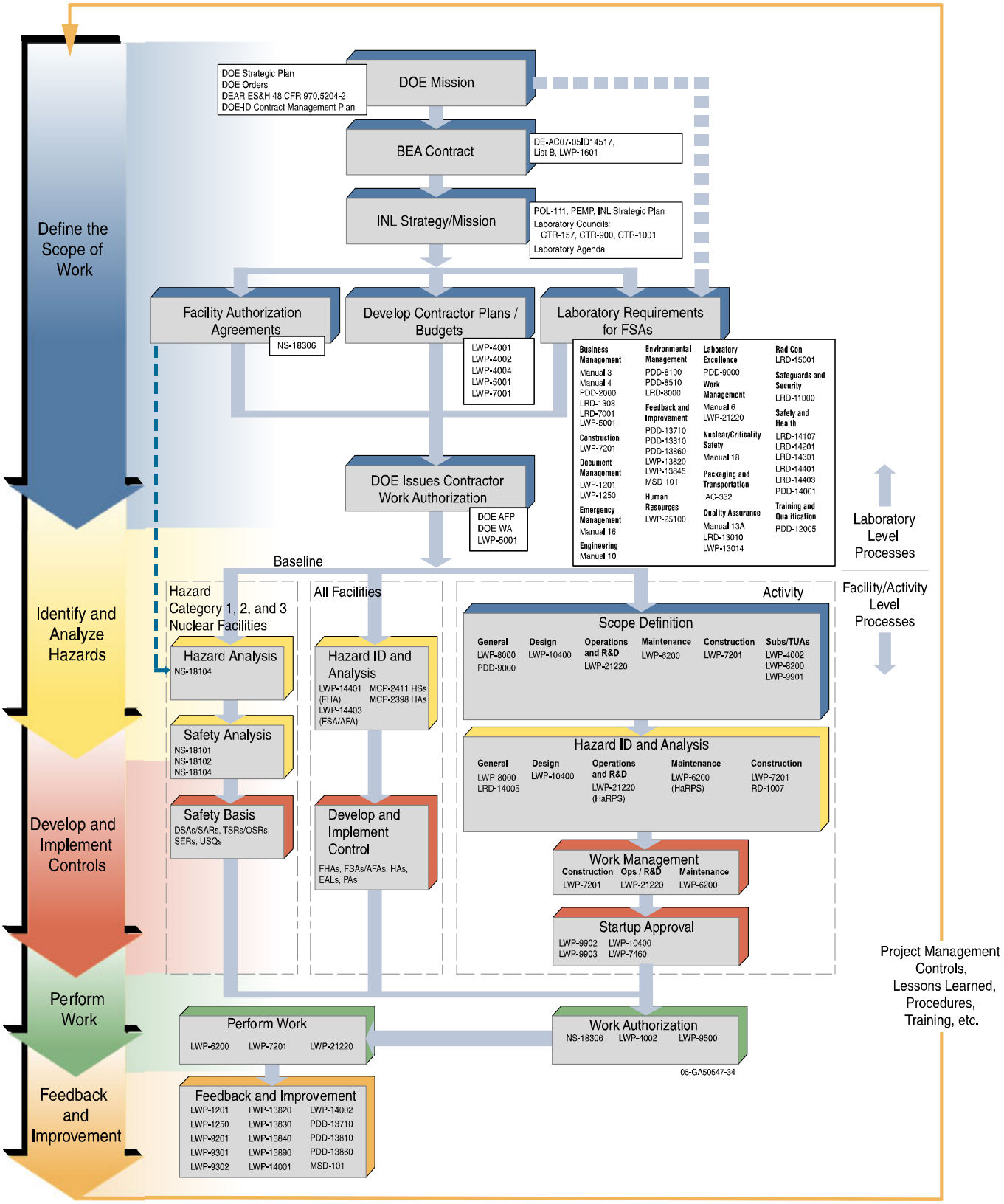


Figure 5. ISMS infrastructure.

5. LABORATORY-LEVEL FUNCTIONAL SUPPORT AREAS

The ISMS infrastructure includes laboratory-level ESH&Q functional support areas that have existed for many years. The ISMS focuses on integrating these functional support areas using the line manager as the focal point through which all work activity is planned and authorized. The integration of the ESH&Q functional support areas and the work management processes that exist at the core of the ISMS rely on the implementation of a compliance management system. Requirements that are contractually binding flow down from (1) federal, state, and local laws and regulations; (2) DOE directives; and (3) consensus standards. Laboratory-level programs that implement these requirements are institutionalized through laboratory-level procedures.

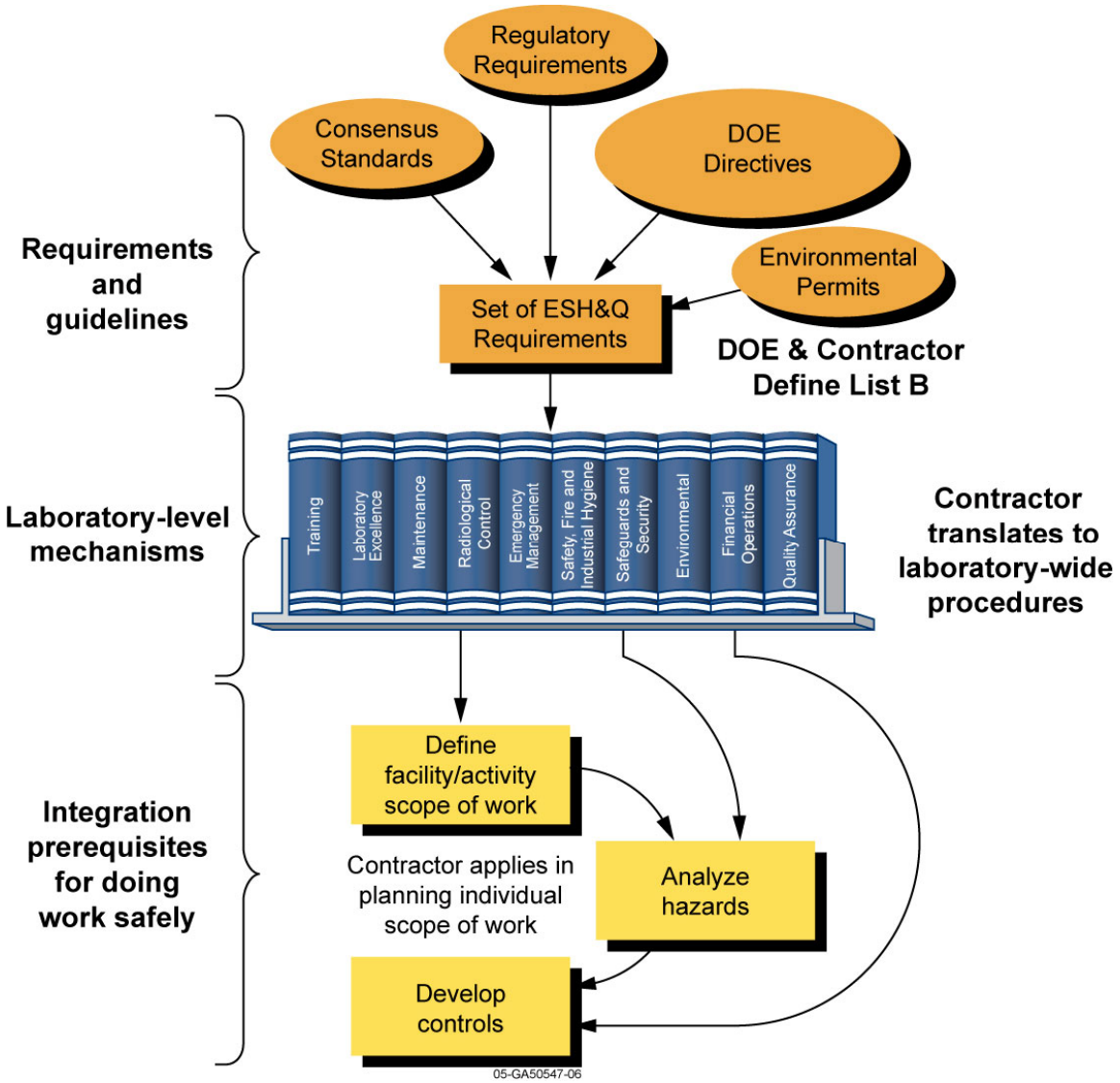


Figure 6. Standards-based safety management.

Figure 6 depicts this flowdown of requirements and standards into laboratory-level implementing procedures. These procedures define the roles and responsibilities for implementing the ESH&Q

functional support area requirements, with a strong focus on the responsibilities of line management for functional support area performance.

The following laboratory-level programs and processes implement contract requirements:

5.1 Laboratory Excellence

PDD-9000, "Laboratory Excellence Program and Organization Structure," describes the Laboratory Excellence Program (LEP) starting with the INL organization structure, key roles and responsibilities for line management's ownership of safety, and implementing documents for Policies and Standards of Performance, Conduct of Operations, Startup and Restart of Nuclear Facilities, and the guiding principles of INL's ISMS. The program also incorporates tools from the Center for Human Performance.

Besides identifying the organization structure and key roles and responsibilities, the LEP is an integration of several related topics that when properly executed utilize human performance tools that demonstrate distinction in operations and will assist the INL in achieving a world-class reputation for operational excellence in safeguards and security, environmental, safety and health. The related topics are:

- Requirements and guidelines relating to DOE O 5480.19, *Conduct of Operations Requirements for DOE Facilities*
- Requirements and guidelines relating to DOE O 425.1C, Startup and Restart of Nuclear Facilities
- Key operational elements of ISMS, in particular: operations authorization, briefings, follow-up reviews, lockout/tagout, startup/restart, and tenant use agreements.

Conduct of Operations programs apply to all facilities and activities at the INL. However, due to the diversity of the facilities and activities at the INL, how the guidance is implemented may vary. The LEP bins the guidance topics into six main areas: Organization and Administration; Training and Qualification; Communications; Operations; Abnormal Events; and Lockout/Tagout. Six LWPs (LWP-9000 through LWP-9500) provide general instruction for implementation, and are used as guidance for development of specific implementing procedures where needed.

5.2 Work Management System

The work management process for R&D and Operations activities are found in LWP-21220, "Work Management." LWP-6200, "Maintenance Integrated Work Control Process," details the work control process for maintenance activities. Section 7.5.3 describes defining scope and balancing priorities at the activity level for work management in R&D and Operations, Maintenance, and Construction.

5.3 Engineering

The Applied Engineering Management System (AEMS) supports INL R&D as well as support organizations by providing processes and standards that appropriately consider and/or are compliant with codes and regulations while achieving safe, effective, and efficient operations of the INL. The System focuses on safe and appropriate engineering

standards (i.e., applicable Building Code, ASME Code, ASHRAE, National Fire Code, National Electric Code, safety design software, security requirements, etc.), which are integrated into engineering design, construction, modification, and operations; and construction coordination and oversight.

Basic engineering elements of the management system include processes and methods for performing calculations and analysis, design control, technical evaluations, interpretation of code, configuration management, and plant engineering; and the tools and standards common to all of engineering as a discipline. These are described in the 10,000 series procedures, of which LWP-10100 through LWP-10600 are the most notable.

Each procedure utilizes a graded approach to managing risks, including developing the proposed work, identifying hazards in a design, finalizing configuration baselines, documenting project planning, performing work, communicating project information, assessing project performance, managing change, and closing out the project.

Processes assure that engineering activities are consistently planned, documented and tracked, and quality requirements are met throughout the process. This includes design, procurement, implementation, testing and qualification, operational use, and formal change control. Because engineering activities vary widely in both scope and complexity, the application of controls may be tempered to accommodate more complex or more narrowly focused tasks while recognizing that, to some degree, specific actions must be included in this process no matter what.

Construction work, as used here, covers management and oversight of the construction of new facilities to meet emerging needs, major alterations and modifications that renew the existing facility portfolio, and disposing of existing facility and land assets that are excess to need. The construction management role is central to integrating, coordinating, and controlling the various aspects of construction work. Coupled with Engineering, Work Management and Project Management, construction work is prioritized, planned and work controlled at the activity-level. Each of the construction work elements, when considered as a discrete entity, can vary substantially in magnitude and complexity of planning required and safety risk potential, and work processes are deployed consistent with the relative risk and complexity.

Processes for controlling construction are described in LWP-7201 through LWP-7204. Basic elements include approved administrative, operating, and/or construction procedures. Appropriate readiness review activities are performed (generally in the form of acceptance tests, punch lists, etc.) following significant facility alterations and/or modifications, or new facility construction.

Construction Managers, with the support of a construction safety SME and other ES&H resources, review contractor Safety Plans. Before authorizing construction contractors to begin working onsite, contractor staff must attend daily pre-job meetings that cover INL safety requirements and expectations. Routine work-site inspections are conducted by the INL Construction Manager and/or construction safety SME to confirm contractor compliance with ES&H requirements and expressed expectations.

5.4 Configuration Management

The INL Configuration Management Program identifies the mechanisms used to ensure consistency between the appropriate design requirements, physical configuration, and

documentation of configuration items necessary to protect workers and the public during the lifecycle of a facility. This is described in LRD-10501, "Configuration Management Requirements," which requires that the INL configuration management program:

- Establish a baseline of requirements and implement a disciplined system that serves to control subsequent changes to the baseline
- Perform reviews to verify that the previously established baseline requirements are included in the design and development of configuration items
- Establish an accounting system that identifies the baseline and tracks changes and change actions thereto
- Provide for assessments of the configuration management program to ensure that it is functioning properly in accordance with the baseline requirements.

PDD-10502, "Configuration Management Program," describes the configuration management program implemented at the INL which applies technical and administrative direction and surveillance over the lifecycle of items to identify and document the functional and physical characteristics of configuration items. Such controls also ensure design documentation accurately reflects the as-built condition of engineered products.

5.5 Environmental Management System

The INL EMS is designed to integrate environmental protection, environmental compliance, pollution prevention, waste minimization, and continual improvement into work planning and execution throughout all work areas as a function of the ISMS. The EMS program is founded on the five core elements of the International Organization for Standardization (ISO) Environmental Management System Standard (ISO 14001), which parallel the five core functions of ISM. The major elements of the EMS include policy, planning, implementation and operation, checking and corrective action, and management review. The EMS is designed to implement the INL's environmental policy and to focus on controlling INL activities in a manner that minimizes the potential to negatively impact the environment. In conformance with the requirements of DOE O 450.1, *Environmental Protection Program*, the EMS is fully integrated with the INL ISMS.

INL attained ISO 14001 Registration of its EMS, effective November 24, 2005, as a result of a three-stage registration audit completed November 10, 2005 by a third party registrar.

The EMS is described in PDD-8100, "Environmental Management System," and implemented throughout INL by Laboratory Requirements Document (LRD) -8000, "Environmental Requirements for Facilities, Processes, Materials and Equipment" and LWP-8000, "Environmental Instructions for Facilities, Processes, Materials, and Equipment." Subsidiary LWPs proceed from these documents as needed to provide additional detailed instructions for specific activities. The requirements of LWP-8000 have been fully integrated into all INL work control processes for consistent implementation throughout INL.

Through agreements with INL, CWI will provide chemical management services and waste management services, including a pollution prevention program, that meet all

regulatory and DOE requirements. Using their requirements management system and procedures, CWI will control chemical management services and waste management services and will be responsible for compliance by their personnel. The instructions for interface with CWI are contained in LWP-8200, "Turnover of Work Covered by Environmental Service Agreements." The extent of INL oversight of the CWI-provided services is identified in the INL Contractor Assurance System. As specified in the agreements, any changes to CWI procedures that require a regulatory interpretation associated with INL activities will be mutually agreed upon by CWI and INL.

5.5.1 Environmental Monitoring and Reporting

The Environmental Monitoring and Reporting program provides for the preparation of required regulatory reports for INL and provides roll-up of data from other site contractors for site-wide reports. Through this program the INL also conducts site-wide environmental monitoring and sampling activities. PDD-8510, "Environmental Monitoring Program Description," identifies the organizations and key project management system elements for the Environmental Monitoring Program segment of the INL at the DOE-ID site.

5.5.2 Chemical Management

Chemical management services are provided by CWI in accordance with IAG-333. Through this SA, CWI provides the labor, equipment, management systems (e.g., databases, contracts), and facilities necessary for the approval, inventory, tracking, and reporting of chemicals and their usage. INL personnel retain the responsibility for handling of chemicals within INL facilities in conformance with the Industrial Hygiene LWP-14607, Hazard Communication." The Hazard Communication Program governing subcontractors is contained in RD-2101, "Hazard Communication." LWP-14620, Chemical Hygiene Plan," applies to all R&D laboratory use of hazardous chemicals and personnel using INL laboratories (such as visiting scientists, students, and personnel from outside agencies).

5.5.3 Waste Management

Waste management services, including a pollution prevention program, are provided by CWI in accordance with IAG-331. Through this SA, CWI provides the labor, equipment, management systems (e.g., databases, contracts), and facilities necessary for safe, effective, and compliant management and disposition of hazardous, low-level, industrial, PCB, recyclable material, mixed low-level waste and transuranic waste to meet the requirements of the DOE. The SA requires that all waste management services be conducted following the specific INL facility work control and onsite transport requirements.

5.6 Voluntary Protection Program

The INL – BEA – was designated a DOE-VPP Star Site on June 1, 2006. The final report from the onsite review noted that all elements of the DOE-VPP Program requirements were satisfied with no findings identified. DOE VPP was established to promote and provide recognition to highly effective safety and health programs. The major elements of VPP are management commitment, worker involvement, work site analysis, hazard prevention and control, and safety and health training. The VPP Vision is "all injuries are viewed as preventable" and our safety value statement is "I will actively care for my safety and the safety of others." Significant information regarding the INL VPP Policy, Vision, and Values is available at the INL Intranet website: Voluntary Protection Program.

DOE encourages all contractor sites to strive toward continuous improvement of occupational safety and health, and that is the expectation of VPP. As a VPP Star site, INL strives for continuous improvement and is willing to mentor other sites working toward the same recognition. The overarching goal of VPP is to continue the focus on zero injuries and illnesses through worker involvement and management leadership. LRD-14004, "Requirements for the VPP Star Process at INL," identifies the basic programmatic elements for continuing the integrity of the DOE VPP Star Status at the INL.

5.7 Industrial Safety/Construction Safety

The Industrial Safety Program, which includes Construction Safety, is established to prevent employee injury from industrial hazards that may be encountered in the workplace. Laboratory-wide program requirements and procedures that establish a baseline for compliance with applicable industrial safety codes and standards are found in Manual 14A, *Safety, Fire Protection, Industrial Hygiene*. The program is based on the requirements contained in DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, the Occupational Safety and Health Administration (OSHA), and applicable industry standards. Industrial safety requirements are integrated in various safety management processes as they apply to the identification and analysis of hazards and determination of appropriate controls for employee protection. The responsibility for establishing laboratory-wide industrial safety program requirements and interpretations belongs to the Occupational Safety and Health Division. Implementation of the industrial safety requirements is the responsibility of line management, supported by industrial safety professionals who are assigned to the area/facility ESH&Q managers.

Associated hazard prevention and control requirements are implemented through the existing work control processes. Certain elements of the consolidated Laboratory industrial safety program require ongoing activities as documented in Plan (PLN) -14001, "INL Safety, Fire Protection and Industrial Hygiene Consolidation Implementation Plan at the Idaho National Laboratory."

5.8 Explosive Safety

The Explosive Safety Program is established to ensure the health and safety of the worker, the public and the environment during the transportation, handling, testing, and

storage of explosives at the Laboratory. Laboratory-wide program requirements and procedures that establish a baseline for compliance with applicable industrial safety codes and standards are found in Manual 14A. The program is based on DOE M 440.1-1A, *DOE Explosive Safety Manual*. The Explosive Safety Program implements Department of Defense and other government regulations.

The responsibility for establishing laboratory-wide explosive safety program requirements and interpretations belongs to the Occupational Safety and Health Division under the guidance of the INL Explosive Safety Committee. Implementation of the explosive safety program requirements is the responsibility of line management, supported by explosive safety professionals.

5.9 Industrial Hygiene

The Industrial Hygiene Program involves the recognition, evaluation, and control of environmental factors or stresses, arising in or from the workplace, which may cause illness, impaired health and well being, or significant discomfort among workers. The industrial hygienists work as members of a safety and health team using ISMS core functions and guiding principles in the evaluation of work areas and employee work activities. Specific industrial hygiene requirements, procedures and general policies are found in Manual 14A. The program is based on the requirements contained in DOE O 440.1A, OSHA, and applicable industry standards. The responsibility for establishing laboratory-wide industrial hygiene program requirements and interpretations belongs to the Occupational Safety and Health Division. Implementation of the industrial hygiene requirements is the responsibility of line management, supported by industrial hygiene professionals who are assigned to the area/facility ESH&Q managers.

Associated hazard prevention and control requirements are implemented through the existing work control processes. Certain elements of the consolidated Laboratory industrial hygiene program require ongoing activities as documented in PLN-14001.

5.10 Fire Protection

The Fire Protection Program is implemented through Manual 14A in accordance with DOE O 420.1B, *Facility Safety.* The Fire Protection Program focuses on recognizing, evaluating, preventing, and controlling fire hazards in the work place (including wildland fire management), minimizing fire losses, and ensuring that the level of life safety is in compliance with applicable requirements, most notably, National Fire Protection Association (NFPA) and OSHA standards. The responsibility for establishing laboratory-wide fire protection program requirements and interpretations belongs to the Occupational Safety and Health Division. Implementation of the fire protection program requirements is the responsibility of line management, supported by fire protection professionals who are assigned to the facility ESH&Q managers. Specific fire protection program responsibilities also reside with the INL Fire Department, the Life Safety Systems, and Engineering organizations.

The INL Fire Marshal's Office has been established to support the DOE-ID Authority Having Jurisdiction responsibilities. This includes fire protection, electrical and life safety related activities and conditions that are to be approved, inspected, witnessed,

and/or performance tested in accordance with national codes and standards. The Fire Marshal is authorized to issue interpretations of the National Fire Codes, International Building, and International Fire Codes in support of Laboratory operations. The Fire Marshal establishes acceptable policy, program and procedures for the review and approval of all fire protection and life safety systems. The Fire Marshal also investigates fires, explosions, related accidents and occurrences involving installed fire protection and life safety systems, as determined necessary. Certain elements of the consolidated INL Fire Protection Program require ongoing activities as documented in PLN-14001.

5.11 Radiological Control

The Radiological Control Program is described in LRD-15001, "INL Radiological Control Manual." This manual, plus various implementing procedures and other documents, describe the program for controlling exposure to ionizing radiation and for handling radioactive materials. LRD-15001 contains the requirements that are fundamental to the Radiation Protection Program, including those in 10 CFR 835, *Occupational Radiation Protection*. Responsibility for overall implementation and oversight of the INL ALARA program is assigned to the INL ALARA Committee. The roles and responsibilities of this committee are defined in CTR-77, "Charter for the INL ALARA Committee."

The Radiological Control Program includes all aspects of radiological control applicable to performing hazardous work, including:

- Excellence in radiological control
- Radiological standards
- Conduct of radiological work
- Radioactive materials
- Radiological health support operations
- Training and qualification
- Radiological records.

5.12 Criticality Safety

The purpose of the Criticality Safety Program is to ensure that appropriate actions are taken to prevent and mitigate the consequences of a criticality accident. Program requirements and recommendations are based on 10 CFR 830, DOE O 420.1B, Chapter III, "Nuclear Criticality Safety," industry standards, and best management practices.

An effective criticality safety program involves organizations other than Criticality Safety and Operations. Such organizations include Emergency Management, Engineering, Safety Analysis, and Training. The criticality safety program is described in PDD-18001, "INL Criticality Safety Program." Laboratory criticality safety requirements and roles and responsibilities are described in LRD-18001, "INL Criticality Safety Program Requirements Manual."

Requirements from the applicable program documents are rolled into procedures at the laboratory, facility, and activity level. This includes design, construction, operation, maintenance, and decommissioning of all facilities and activities that contain or handle fissionable material, with the exception of fissionable material in nuclear reactor cores, which is exempt.

5.13 Nuclear Safety Analysis

The Safety Analysis Program, using the graded approach as applicable, addresses the requirements and guidance for safety analysis, the planning of safety analysis tasks, and the preparation of safety basis documents in accordance with NS-18101, INL Safety Analysis Program. This includes supporting facility categorization based on radiological or fissionable material inventory, drafting of new or the revising of existing safety basis documents, and ends with contractor-approved or DOE-approved documents that are ready for implementation. The hazard categorization of INL facilities is performed in accordance with the requirements in Subpart B of 10 CFR Part 830, "Nuclear Safety Management" and the October 11, 2005 DOE-ID supplemental guidance, *Nuclear Facility Safety Analysis Supplemental Information.*

5.14 Occupational Medicine

Occupational Medicine provides a comprehensive medical program using an occupational paradigm. The goals of Occupational Medicine are preventing occupational injuries and illnesses and educating workers in methods for optimizing their physical and mental health. This organization provides services in areas that include the Occupational Medical Program (accredited by American Association of Ambulatory Health Care Certification and re-certified in 2004), Employee Assistance Program, Health Promotion Program, and the Workman's Compensation Administration Program. These services are provided to the Laboratory, CWI (under IAG-272, "Service Agreement for Occupational Medicine Program"), the Naval Reactor Facilities, and DOE-ID. The program description document is PDD-61, "Occupational Health Program."

5.15 Emergency Management

The Emergency Management Program is designed to protect lives, property, and the environment in the event of an emergency. The program provides expertise, guidance, oversight, training, and counsel related to the elements of emergency preparedness planning and readiness assurance. The emergency management program used at the Laboratory is an all-hazards program in that it includes considerations for mitigation, response, and recovery from hazards presented by radiological, toxicological, and all other potential sources of injury or harm to personnel, the environment, or material resources.

The Emergency Management Program includes the requirements of DOE O 151.1C, *Comprehensive Emergency Management System*, as well as those associated regulations issued by other government agencies. LRD-16100, "Emergency Management System," provides requirements and references for emergency management. Manual 16A, *INL Emergency Plan/RCRA Contingency Plan,* describes the program.

As an INL service, the Emergency Management Program is also applicable to CWI and is managed through IAG-271, "Service Agreement for Emergency Services and Fire Department."

The INL Fire Department provides all types of firefighting services (e.g., structural, vehicle, and wildland) emergency medical services, hazardous material release mitigation, and rescue services (including confined space) at INL and surrounding communities and agencies as identified in reciprocal agreements.

5.16 Quality Assurance

The Laboratory Quality Assurance Program (QAP) documents and implements the requirements contained in the QA Rule (i.e., 10 CFR 830, Subpart A, Quality Assurance Requirements) and the QA Order (i.e., DOE O 414.1C, Quality Assurance). Both the QA Rule and the QA Order require that the QAP use appropriate national consensus standards. The Laboratory QAP uses ASME NQA-1, "Quality Assurance Requirements for Nuclear Facility Applications," as the primary basis of the program but also uses other standards for specific processes such as instrument calibration and nondestructive evaluation. In accordance with the QA Order, the Laboratory QAP also uses DOE guides and NQA-1 guidance in developing QAP implementing processes and procedures.

QAP documentation consists of Manual 13A, *Quality Assurance Program Requirements*, which describes the QAP and its requirements; LWPs, which detail implementation of the QAP requirements; and management control procedures (MCPs) or Technical Procedures (TPRs), which detail facility or organizational-specific implementation.

The Laboratory QAP is fully integrated with the INL ISMS. This integration is primarily achieved through the implementation of a graded approach. The INL QA Graded Approach applies to all INL items and activities affecting quality and is applied by determining quality levels of the items or activities and specifying the depth, extent, and rigor of application of QA requirements in implementing documents.

Two methods of determining quality levels are used: one is based upon a direct analysis of risk; the other uses an indirect risk analysis. The direct risk analysis method includes determining the results of failure of the item or activity, the potential consequences of failure, and the probability of failure. The indirect risk analysis is similar to the direct risk analysis but uses the functional importance of the items or activities as a substitute for potential consequences and the relative importance of activities associated with ensuring the function as a substitute for probability. Quality levels are assigned based on the risk determinations. Quality Levels 1, 2, and 3 correspond to high, medium, and low risk respectively.

QA requirements are applied through the following processes using quality levels assigned by this procedure for each activity described by the processes:

- Calculations and Analysis (LWP-10200)
- Design Control (LWP-10400)
- Configuration Control (LWP-10500)
- Software Quality Assurance (LWP-13620)
- Procurement (LWP-4001, LWP-4002)
- Material Control (LWP-13120)
- Project Management (LWP-7001)
- Construction (LWP-7201)
- Maintenance (LWP-6200)
- Research and Operational Activities Work Management (LWP-21220)
- Fabrication (MCP-1346, MCP-1451, W0000-0155-AP-00)

5.17 Training and Qualification

Training and qualification programs are established to ensure employees are trained to safely, competently, and effectively perform their job functions, while protecting themselves, the public, and the environment. Laboratory-wide Manual 12, *Training and Qualification*, is applicable to all training-related activities conducted at the Laboratory. The manual follows the systematic approach to training (SAT) model and outlines the processes for conducting training analysis, design, development, implementation, and evaluation activities, but is not intended to prescribe specific training programs.

The procedures in Manual 12 are written to allow for the use of a graded approach, as appropriate, to job and facility hazards and requirements.

All structured training programs are required to be defined in the TRAIN system using job codes and/or qualification codes. In addition, these programs may be documented using the following: LWPs, MCPs, training program plans, training program description documents, training implementation matrices, Training Requirements Matrix. How structured training programs are documented is either based on applicable List B requirements or line management preferences.

The Annual Training Process (ATP) is the systematic method used to identify, validate, cost and schedule existing and new training requirements. The process ensures that all applicable regulatory training requirements from the contract are efficiently and consistently incorporated in employee training plans.

5.18 Safeguards and Security

The Safeguards and Security (S&S) Program is managed through the Integrated Safeguards and Security Management System (ISSMS) as defined in DOE P 470.1, *Integrated Safeguards and Security Management (ISSM) Program*. ISSM is based on core functions and guiding principles similar to those that define the INL ISMS. ISSM provides a formal and structured process for planning, performing, assessing and improving secure conduct of work through the tailored application of risk-based protection strategies.

The S&S Program ensures appropriate measures are in place to provide a secure environment for program and facility operations and provides for the protection of and accountability of classified and sensitive information, nuclear materials, and computer systems and other assets.

DOE Orders, Manuals and Notices, and other regulatory documents define the requirements for the S&S Program. Laboratory Manuals 11 A - E contains implementing documents that establish program requirements in the areas of protection program management, personnel security, classified matter protection and control, information security, physical security systems, protective force, safeguards and nuclear materials control and accountability, and classified cyber security.

5.19 Packaging and Transportation

Through a service agreement with the Laboratory (IAG-332, “Packaging and Transportation”), CWI provides Packaging and Transportation services. The Packaging

and Transportation Program is established to ensure materials and items are packaged and shipped onsite or offsite safely and in accordance with applicable regulations. PRD-5041, "Packaging and Transportation," and PRD-310, "INL Transportation Safety Document," specify and interpret those requirements specific to packaging and transportation of materials to ensure optimum safety, economy, efficiency, and cargo security, while meeting regulatory statutes, directives, and policies. The program is based on 10 CFR 830, Subpart B, and 49 CFR regulations, invoked by DOE O 460.1B, *Packaging and Transportation Safety*. The Packaging and Transportation program also involves the design, procurement, and selection of appropriate packaging to mitigate the hazards of material being shipped. MCP-2669, "Hazardous Material Shipping," (Manual 17) provides instructions for the receipt and shipment of hazardous material.

INL Management System Transformation. By contract with DOE, BEA's principal focus is to transform from a mission focused on decontamination and decommissioning (D&D) to one focused on nuclear energy and national security research, development, and demonstration (RD&D). To facilitate this transformation, the INL Laboratory System Transformation Program (LSTP) was established with a primary objective to transfer Battelle experience, knowledge, and insights in laboratory management to the INL and its workforce. A basic premise is to functionally realign the INL management enterprise so that it focuses on enabling the RD&D mission.

Management Systems provide the framework or vehicle for managing and transforming the INL management enterprise. The Laboratory is too complex to manage as a single unit; systems provide manageable units. In simplest terms, management systems are logical and manageable groupings of INL functions with their associated implementing processes.

Management systems are an enhancement to the long established functional support areas.

- Functional areas are focused on compliance and have limited responsibility for mission accomplishment; management systems have responsibility and accountability to help the line accomplish mission while being compliant.
- Functional areas are limited and focused to those functions that directly implement contract requirements; management systems integrate safety and compliance with mission accomplishment across all laboratory functions.

As illustrated in Figure 7, integration across functional and organizational boundaries is a key enhancement goal for management systems.

Management systems provide the processes and procedures that enable our Laboratory's organizations to successfully operate the laboratory and deliver the vision.

The Systems Integrating Management System (SIMS) is the "architect" of management systems, chartered to ensure all systems effectively and compliantly work together to meet the defining purpose of the Laboratory.

SIMS provides the capability to deliver laboratory-wide processes through simple instructions, taking advantage of flow-charts and automated tools. Instructions and information are structured and written for the user with basis and peripheral information hidden but available. Processes are dynamically integrated and managed in a database environment where components can be shared.

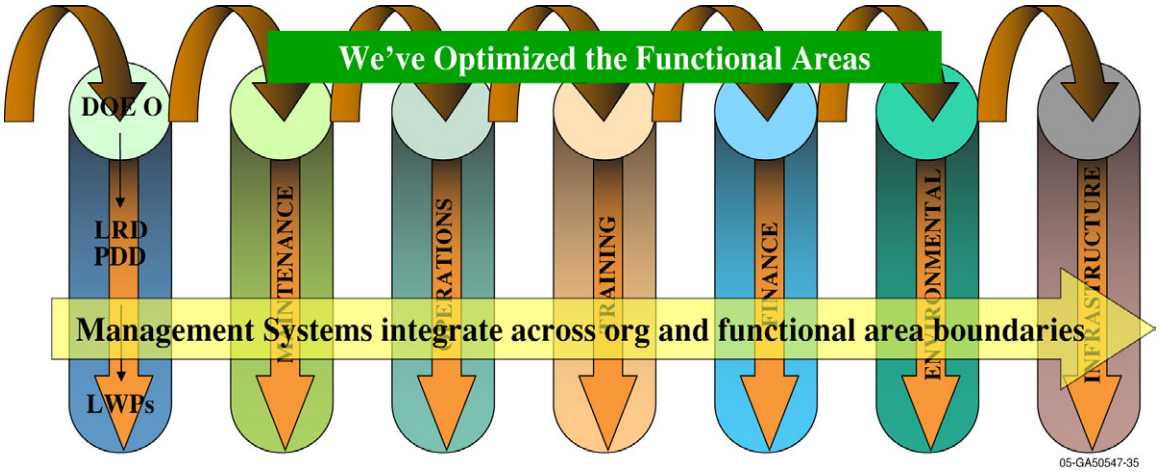


Figure 7. Management systems integration across organizational and functional area boundaries.

Transformation Approach. A key to successful management systems transformation is ensuring that effective control is maintained as functional areas are absorbed and integrated into management systems. To that end, management systems are being developed congruent with the maintenance of existing functional areas. As Management System processes are reviewed and approved for use, legacy functional area elements are retired. Currently, only the processes summarized below have been transformed.

- Electronic Document Management (eDOCS), a function of SIMS, was chosen as the first transformation project because it provides the delivery platform for all management systems. (Refer to LWP-1250)
- Project Management was chosen next because a robust risk-based approach to project management is needed in anticipation of program growth and it is a BEA priority and commitment to DOE-ID to implement a certifiable Earned Value Management System.
- Work Management was chosen as one of the first transformation projects because it replaces a number of redundant processes and consolidation was not considered worth while due to the extensive cross-cutting nature of the work management. (Refer to Section 5.2)
- Applied Engineering Management System (AEMS) provides a user-friendly, unified, graded approach to engineering systems, practices, procedures, and processes. AEMS processes include design, configuration management, and construction. (Refer to Section 5.3)

6. BUSINESS, BUDGETS, AND CONTRACTS PROCESS

Integrating the business systems used to define Laboratory scope and to balance priorities is critical to the success of the INL ISMS because it sets the stage for the scope and depth of hazards identification and analysis, is the foundation for the budget formulation and allocation process, and is the primary factor in establishing expectations and accountability. The processes were designed to define the scope, schedule, and costs of activities necessary to achieve DOE missions and expectations in a safe and environmentally sound manner, a fundamental objective of ISMS Core Function 1, and Guiding Principle 4.

The business processes used to translate the laboratory mission into work scope and how ESH&Q requirements are integrated into those processes are described in this section.

6.1 Assess the Mission and Establish Expectations

Laboratory planning is an ongoing process that begins with the INL Strategic Plan and Laboratory Agenda, developed by the INL Senior Leadership-Management Team (LMT). The strategic plan is used to translate the statement of work, mission statements, and commitments specified in the M&O contract into strategic objectives covering a 10-year period.

The two basic components of the INL Strategic Plan are:

1. Strategic Plan Objectives - address Laboratory missions as defined in the contract. A key INL strategic objective is "Demonstrate World-Leading Safety, Environmental, and Operational Performance." This objective includes "integrating safety management and human performance principles into all work planning and execution" demonstrating that safety is a balanced priority.
2. Transformation Timeline – key milestones planned for the next 10 years and beyond. Accomplishment of these milestones helps ensure that DOE's vision for the INL is achieved.

The Laboratory Agenda is comprised of a strategy map and scorecard. The strategy map provides a simple method of communicating on one page the interdependent strategies being pursued to achieve the Laboratory mission. The Strategic Plan itself is organized to this map. The Laboratory Agenda Scorecard is organized by strategic objectives and identifies execution year milestones (and associated resource needs) that contribute to implementation of the strategic objectives. A subset of these milestones become fiscal year Performance Evaluation Measurement Plan (PEMP) measures, as negotiated with DOE. The Laboratory Agenda serves as the primary tool for measuring, aligning, and managing strategy execution. The process and facilitation for development of the INL Strategic Plan and Laboratory Agenda is the responsibility of the Science and Technology Strategic Planning Organization. The LMT conducts an on-site review of the plan for the NE-HQ, DOE-ID, and key program sponsors; updates the plan; and obtains DOE approval of the plan on an annual basis.

Other documents derived from the INL Strategic Plan and Laboratory Agenda include Program Directorate Business Plans and Functional area plans (such as the INL Ten-Year Comprehensive Site Plan).

These high-level planning documents serve as the basis for fiscal (execution) year and project/non-project plans discussed in Section 6.4, Work Planning Cycle, for programmatic (direct) and indirect budgeted work scope. Identification of safety hazards and risk mitigation is a factor used in all phases of Laboratory planning. As depicted in Figure 8, planning information flows horizontally as well as vertically to ensure mission expectations are integrated into organizational functions as well as program functions.

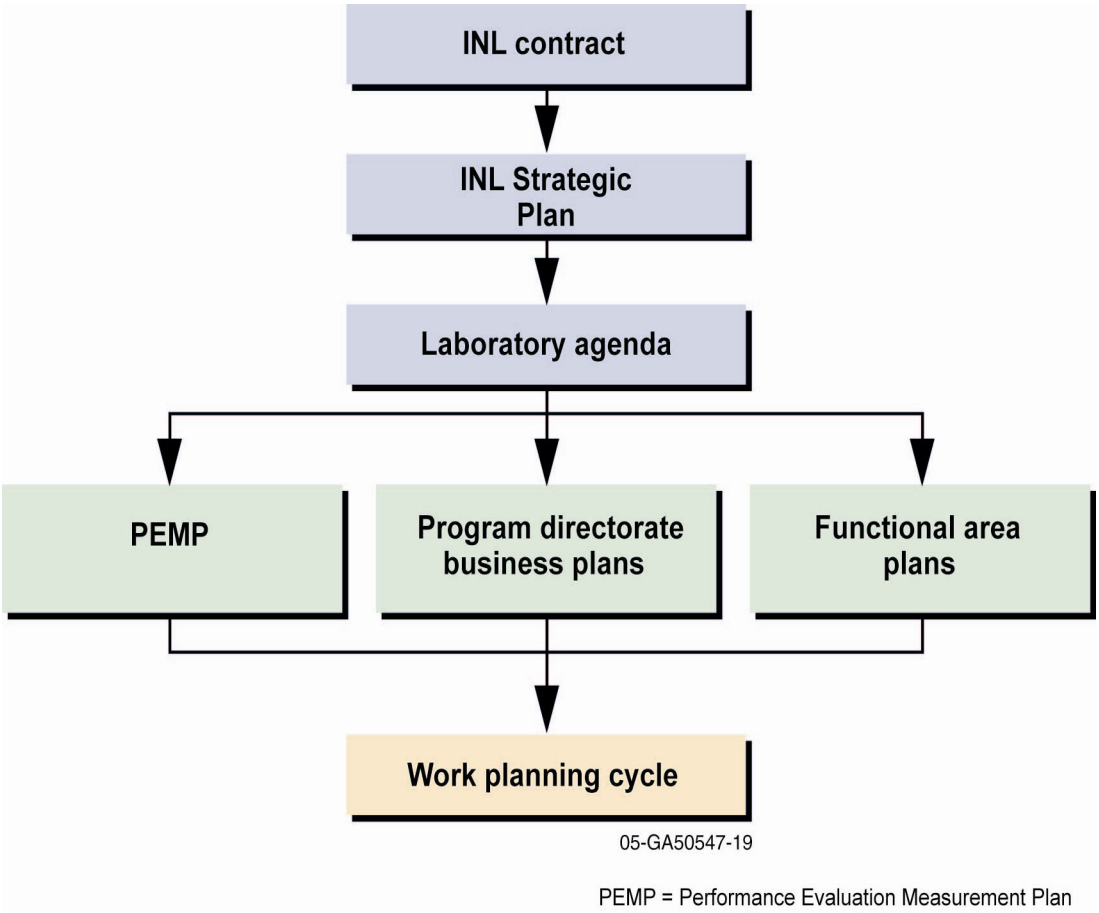


Figure 8. Assess the mission and establish expectations.

6.2 Integration of Laboratory Business Systems to Support Planning

Financial Operations is responsible for ensuring all work scope (direct and indirect funded) is planned and controlled to meet financial and project control requirements. The procedures for meeting these requirements reside in Manual 5, *Project Control System (PCS)*. Due to the wide variety and diversity of INL project sponsors and their specific planning and funding requirements, Financial Operations deploys a team of Planning and Financial Controls (PFC) specialists and a PFC Business Lead to each of the LMT organizations. This team provides assistance in the implementation of the PCS processes and performs independent oversight of financial and project controls.

The INL Project Management Office (PMO) is responsible for the INL Project Management System ensuring there are processes for managing Capital Acquisition Projects governed by the DOE O 413.3, *Program and Project Management for the Acquisition of Capital Assets*. Project management procedures are contained in Manual 7, *Project Management*. The INL project management processes can be tailored to meet non-capital acquisition projects (direct or indirect funded) if INL management, DOE-ID, or project sponsors determine it necessary. Procedures for management of construction

projects also reside in Manual 7. The PMO provides training and assistance to project managers in implementing project management requirements.

Supply Chain Management is responsible for ensuring the flowdown of ISMS requirements to subcontract/vendor personnel and for processing non-DOE funded Work for Others contracts. Procedures pertaining to these processes are contained in Manual 4, *Procurement*.

The Laboratory procedures that implement the work planning processes to enable the start of activity-level planning are:

- LWP-5001, "Project Control System Responsibilities"
- LWP-7001, "Management of Projects"
- LWP-4004, "Work for Others Contract Process"
- LWP-4002, "Service Acquisitions" (Reference Section 3.5 for additional information).

Processes in all systems have factored in applicable ESH&Q (nuclear and non-nuclear) requirements to ensure integration of safety requirements with Laboratory business processes as discussed in the following sections.

6.3 Laboratory Work Breakdown Structure

The INL uses a Laboratory Work Breakdown Structure (LWBS) to define all indirect- and direct-funded work scope, categorize scope by Laboratory Business Element, assign management planning and control responsibilities, and analyze and report cost and schedule performance. The LWBS is integrated with project work breakdown structures to ensure financial integration of the Project Control and Project Management Systems. The framework of the LWBS is determined by the management and reporting needs of the LMT and may change for consistency with the mission and/or strategy of the INL. Major changes in the framework of the structure normally occur on a fiscal year basis; occurring prior to the beginning of a fiscal year.

6.4 Work Planning Cycle

The work planning cycle, as depicted in Figure 9, is integrated with the "ID Work Control Process" identified in the contract; strategic objectives defined in the INL Strategic Plan; and PEMP criteria. Processes that occur prior to the execution of work were designed to:

- Provide compliance with contract requirements
- Translate missions into work requirements in conjunction with the prioritization of budget and resources
- Identify potential hazards associated with proposed work and provide a more accurate estimate of funding required
- Determine resource allocation and priority assignments necessary to safely accomplish the work
- Establish expectations for safe and efficient performance of work

- Provide integration within the line organizations and integration among the different organization functional elements (e.g., procurement, engineering, facilities, ESH&Q, and operations).

LWP-5001 and LWP-7001 provide the responsibilities and instructions for implementing the PCS processes. LWP-5001 is the "umbrella" procedure for functional support procedures contained in Manual 5; procedures that are applicable to the Financial Operations personnel who assist the LMT organizations implement the processes. Appendix C illustrates the flow and alignment of the PCS functional procedures with other laboratory-wide procedures and systems.

It is the responsibility of LWBS managers/project managers to understand and implement the PCS responsibilities defined in LWP-5001. It is also their responsibility to determine applicability of project management requirements, as defined in LWP-7001, and implement accordingly.

The ESH&Q and Nuclear Safety Engineering (NSE) functional reviews of budget/funding requests and planning documents, as discussed in following sections, are performed to ensure adequate protection of the public, workers, and environment, and compliance with contract and regulatory agreements.

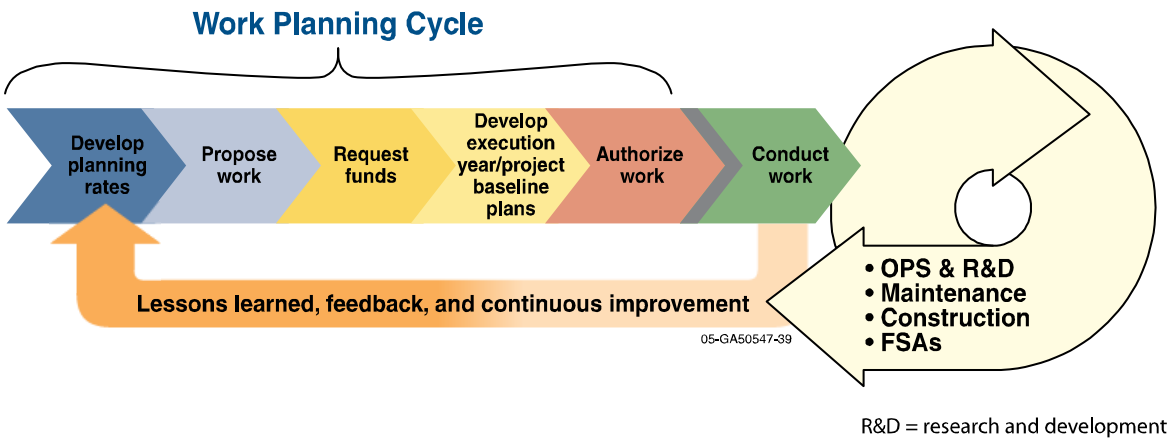


Figure 9. Work planning cycle.

6.4.1 Develop Planning Rates

Using the Strategic Plan objectives and input from the LMT, Financial Operations prepares the out-year indirect planning rates for the DOE Budget Formulation and execution year planning processes. Adjusting planning rates is an ongoing process for continuity with changes to INL's program funding profile and Strategic Plan objectives.

6.4.2 Propose Work

The identification of proposed work is a continuing process and can originate in any of the INL organizations. It is the responsibility of the respective LMT member to determine the applicability and prioritization of proposed work to the mission and strategic objectives of the INL as identified in the Strategic Plan.

6.4.3 Request Funds

Upon approval of proposed work, funds must be obtained. Identification of potential ES&H hazards and mitigations is an important step in requesting funds to understand the risk associated with the work scope and to ensure sufficient funding is requested for safe execution and control of work. Developing budget request proposals requires significant interaction between the program/project managers, performers, and facility owners where the work will be performed to better define performance expectations and hazard mitigation. ES&H checklists for identifying hazards are a required tool when developing funding requests per LWP-5001.

It is the INL policy to request funding estimates that meet all compliance requirements and to maintain minimum safe conditions for facilities and operations. In instances where the funding targets provided by DOE program sponsors are lower than the required funding, INL provides information to support supplemental funding requests. Supplemental information is provided to clearly identify the impacts of the funding shortfall, including projected vulnerabilities and risks not addressed in the target funding proposal.

The funding profile at INL consists of DOE and non-DOE funded work. Non-DOE funded work is generally referred to as "Work for Others."

- **DOE-Funded Work**

The process for development of DOE-funded budget request proposals is known as the Budget Formulation Process, implemented by LWP-5001. The process for submitting funding proposals is either through the DOE Annual Unicall or on an as-requested basis (referred to as Out-of-Cycle requests). Budget request proposals are prepared by INL as prescribed in the DOE-ID Field Budget Call Letter. DOE-ID reviews and approves the budget request proposals prepared by INL and transmits them as a package to DOE-HQ for consolidation into the congressional appropriation request.

Submittal of Out-of-Cycle budget request proposals occurs as-needed and is identified by the program sponsors and/or DOE-ID counterparts. Generally, this is work scope that is performed by INL in conjunction with another DOE laboratory for which the other laboratory obtained funding through their DOE Annual Unicall process.

- **Non-DOE Funded Work**

LWP-4004 describes the process for requesting non-DOE (Work for Others) funds.

6.4.4 Develop Execution Year Plans

INL plans and budgets are developed, prioritized, and/or updated annually for all programmatic and indirect budgets for the upcoming execution year. Considering the diversity of program sponsors and types of projects/work

conducted at the INL (Capital Assets, Operations and R&D), the level of detail in the execution year work plans varies as follows:

- R&D work for which funding and scope has not yet been identified, agreed upon, and/or requested is planned at a high level of detail, recognizing the detail can be revised once the work has been requested and funding received. A Projected Business Volume Forecast is prepared for this type of R&D work.
- Projects governed by DOE O 413.3, *Program and Project Management for the Acquisition of Capital Assets*, require more detail. If the project life-cycle baseline has already been approved, the fiscal year plan only represents a current forecast of scope, schedule, and resource utilization for the execution year and does not represent a formal change to the approved baseline.
- The level of detail for remaining work is commensurate with the importance of the work, its complexity, the potential risk of associated hazards, and DOE-ID/sponsor requirements.

Financial Operations is responsible for development and dissemination of fiscal year planning guidance for the development of direct funded plans and indirect budgets. Planning guidance includes planning rates, strategic direction and commitments, documentation formats, and schedules for completing the planning process. The guidance also includes specific functional area planning requirements as defined by the applicable organization, including ESH&Q requirements to enhance functional integration into the plans. GDE-112, "INL Fiscal Year Planning Guidance," provides an overview of the fiscal year planning processes implemented through LWP-5001, including links to specific fiscal year financial and functional area information.

Work plans are developed with input provided by potential functional performers of the work and owners of facilities and operations where the work is planned to be performed. The ESH&Q organization provides points of contacts to each LMT member to review proposed work scope and estimated resources to ensure ES&H aspects of the work have been properly identified and estimated ESH&Q resources are adequate to mitigate potential hazards. The NSE Organization reviews documentation for work to be performed at nuclear facilities. INL-required planning documentation (Control Account and Work Package) includes a section that specifically addresses nuclear and non-nuclear ES&H elements of all proposed work.

Estimated labor and non-labor resources (for all functional organizations) are identified at a level of detail that provides information for reconciliation of resource needs against resource availabilities. This requires integration within line organizations and integration among the functional support area organizations (e.g., supply chain management, business administration, engineering, nuclear operations, ESH&Q, Nuclear Safety). Final decisions for work/budget priorities are the responsibility of the LWBS/project manager. Priorities are established to meet sponsor requirements while maintaining

facility and worker safety and essential services. If there are any safety concerns pertaining to the priorities and/or resource allocations established by a LWBS/project manager that cannot be resolved at their level, the issue can be taken to the LMT for resolution. Approvals are obtained from sponsors and DOE-ID program counterparts. LWP-5001 establishes the LMT as the authority for resolving work priority and resource allocation issues.

Indirect budget targets are established by Financial Operations per the direction of the LMT and are a reflection of the fiscal year planning rates. Assessment and incorporation of ES&H requirements for the indirect planning process is the same as described above for direct funded work.

The indirect budget for *establishing and maintaining* an INL ESH&Q Program is developed and managed by the ESH&Q Director. Activities to *implement* the ESH&Q Program requirements are budgeted in indirect and direct-funded accounts in accordance with Laboratory charging practices.

The budget for *establishing and maintaining* an INL Nuclear Safety Program is developed and managed by the NSE Organization, under the direction of the Nuclear Operations Associate Laboratory Director (ALD). Activities to *implement* requirements of the Nuclear Safety Program are included in direct-funded work plans per INL charging practices.

The Laboratory Indirect Budget Review Committee (IBRC) conducts a review of the indirect execution year budgets per CTR-5001. The IBRC reviews focus on determining if Strategic Objectives can be safely and cost effectively implemented, within budget targets established by the LMT. The IBRC provides recommendations to the LMT pertaining to the adjustment of budget targets and/or planning rates. As a member of the LMT, the ESH&Q Director ensures safety requirements are factored into final budget targets. Upon resolution of issues by the LMT, Financial Operations finalizes the targets, facilitates the completion of planning documentation, prepares a summary package, and submits the package to DOE-ID for approval.

6.4.5 Project Execution Plans

The Project Execution Plan (PEP) or equivalent project strategy/planning document, as required by LWP-7001, identifies ESH&Q requirements applicable to a project. A PEP addresses the life-cycle of a project and can range from one to several pages, depending on the size, complexity, and risk of the project. The PEP is developed by a multi-disciplined team, as applicable, ensuring functional integration of requirements and balanced priorities.

The development of a PEP may occur during the same time period as execution year planning documents are prepared – if the project is fiscal-year driven. The PEP takes into consideration the life-cycle of a project; a fiscal year plan only covers the period for a specific fiscal year.

6.4.6 Authorize Work

DOE-ID authorizes INL to begin direct-funded work via work authorization forms and the Approved Funding Program (AFP). Work authorization provides information on work scope and period of performance. The AFP provides funding. Both DOE-ID authorizations are required before Financial Operations issues approval for work to start.

Funding (budget) authorization for indirect budgets is provided by Financial Operations to the applicable LWBS manager upon completion of planning documentation and prior to the beginning of the fiscal year.

With the exception of projects with approved life-cycle baselines (per LWP-7001), fiscal year direct and indirect plans serve as "performance baselines" upon which financial scope and performance can be measured against throughout the fiscal year.

6.5 Managing Work within Scope, Schedule, and Cost Controls

Common project control tools and methods continue to be used during the execution of work to monitor scope, schedule, and cost performance for direct and indirect funded work/budgets. Potential problems are identified, corrective action plans are prepared, and customer progress reports are developed in accordance with DOE-ID/sponsor requirements. Program/project personnel conduct periodic program reviews with DOE-ID and project sponsors to discuss cost and schedule progress and significant issues. Financial Operations provides a cost performance report of the indirect budget to the LMT on a monthly basis. Cost performance reports are provided to DOE-ID as requested and per contract requirements.

Due to the diversity of INL funding sponsors and the impact of potential changes, change control criteria and methods vary in accordance with funding/project sponsor requirements. LWP-5001 and LWP-7001 contain instructions for project, funding, indirect budget, and contract change control processes.

6.6 Project Control System Lessons Learned, Feedback and Continuous Improvement

Financial Operations and the PMO gather data through DOE-ID and customer/sponsor feedback, lessons learned, and self-assessments to evaluate the effectiveness of the project control and project management processes. Based on this feedback, processes are enhanced to achieve continuous improvement. The INL's ability to better understand the effectiveness of these processes is achieved through the deployment and co-location of Financial Operations and project managers with the LMT members and their respective managers. Benefits of providing a group of PFC personnel, under the direction of Financial Operations, to support each LMT organization implement the PCS processes include:

- More effective training and utilization of resources by maintaining a centralized functional group of personnel.

- Quicker response to implementation of system changes. Personnel, skilled and competent in the implementation of PCS processes, can assist in on-the-job training for LWBS/project managers to ensure compliance to LWP-5001 requirements.
- Co-location and active participation of PFC personnel with the LMT members and their respective organization/project managers result in the employee's "vested interest" in process implementation. This allows for expedited identification of customer system concerns and PFC's ability to alleviate those concerns by increasing awareness in the use of the system and/or assisting in the recommendation and implementation of system enhancements.

7. INTEGRATION OF SAFETY INTO WORK

Preceding portions of this document have addressed the basic BEA management organization and expectations, functional support areas, and business operations. Requirements for the INL flow down from the contract and are institutionalized at the laboratory level and then implemented by line management using prescribed processes. This section will address in greater detail the processes for planning and performing work safely at the laboratory, facility, and activity levels. The discussion is organized along the lines of the five core functions and eight guiding principles. Those core functions and guiding principles which are closely aligned are grouped to add clarity regarding integration in the ISMS and also a better understanding for the reader of integrated BEA programs and processes; those better described individually are reflected in that manner (e.g., Line Management Responsibility for Safety, Guiding Principle 1).

7.1 Guiding Principle 1 – Line Management Responsibility for Safety

The cornerstone of ISMS success depends on employee involvement and management commitment.

Line management at the institutional, facility, or individual activity level, ensures hazardous work is planned, analyzed, controlled, and authorized by an accountable line manager. The owning line manager understands the technical basis and associated hazards of the work, is aware of all activities, knowledgeable of institutional and facility safe operating requirements, and manages change control. (DNFSB Technical Report 36)

The INL aspires to be an accident-free workplace, as stated in Policy 6 of POL-111. Everyone is responsible for safety, as individuals, as peers, and as managers. At the INL, "Line Management" is a term used to identify a specific group of personnel that has roles, responsibilities, authorities, and accountabilities to own, set expectations, approve, authorize, release, and brief hazardous work. The role does not stop at the completion of the briefing, but continues through the performance and follow-up of the activity.

Line management is responsible for safety and assumes the direct responsibility to achieve the commitment to safety and protection of the environment through the active identification, evaluation, prevention, and mitigation of hazards.

For subcontractors, PDD-1001, "Subcontractor Requirements Program Description," addresses subcontractor line management responsibility for safely performing their work.

PDD-9000 describes a three-phase, four-step approach: Approving the document, Authorizing the work, Releasing and briefing to ensure line management "owns" safety at the facility and activity level. Line management will ensure that:

- Work is planned in accordance with laboratory policy
- Adequate implementation of controls is verified prior to authorization to commence work
- Work is within the approved safety basis for the facility
- Work is approved and conducted safely according to Laboratory policies.

Approve: Department Managers and Laboratory Managers (LMs) approve technical documents that implement hazard controls to ensure they are planned in accordance with Laboratory procedures and to ensure the activity is within the safety envelope and/or tenant use agreements.

Authorize: Nuclear Facility Managers (NFMs), Facility Managers (FMs), and Laboratory Space Coordinators (LSCs) authorize work to ensure start-up/restart activities are completed, and to coordinate scheduling and resolve conflicts.

Release: Supervisors, Facility Project Managers, Principal Investigators, and LSCs ensure conditions are conducive for activities to proceed in their respective areas. Personnel performing briefings ensure employees are ready to perform the activity.

The Laboratory line management structure for approval, authorization and release of work is pictured in Figure 10. Additional line management organization charts are on the INL homepage website.

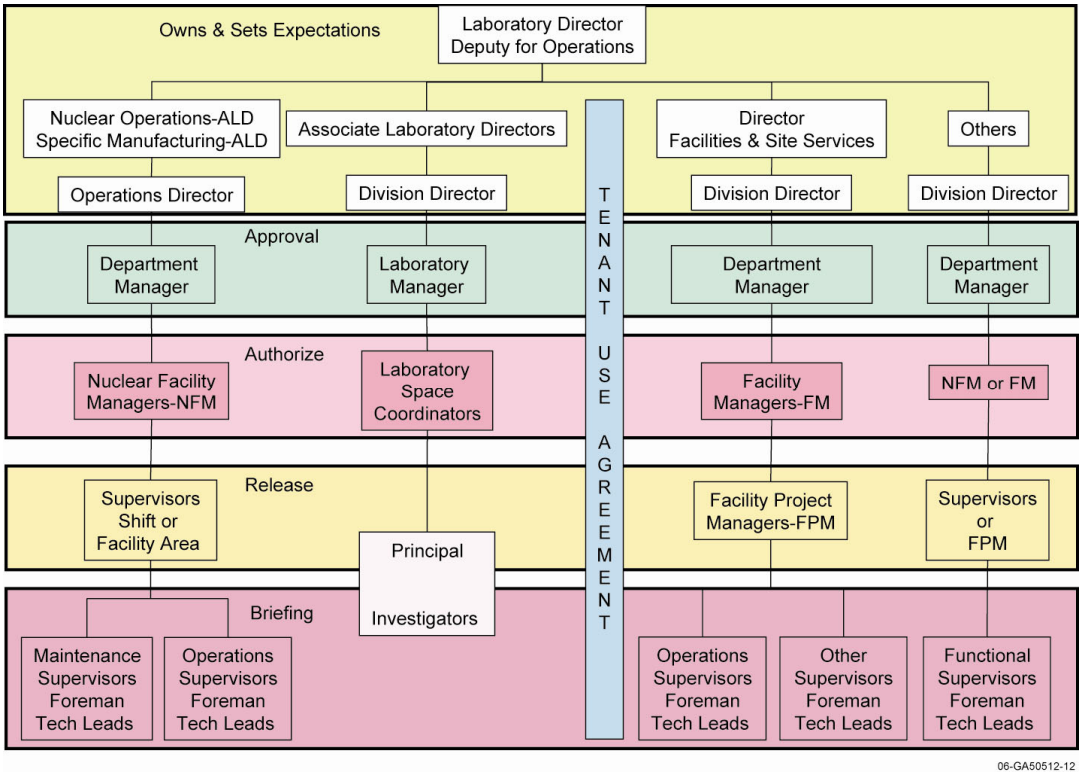


Figure 10. BEA line management for approval, authorization, and release of work.

Laboratory Managers. LMs are assigned by the Division Directors to be responsible to manage the safe conduct of research in assigned laboratories.

Laboratory Space Coordinators. LSCs are assigned by the LMs to be responsible to authorize start of work and oversee activities and operations in assigned laboratories.

Nuclear Facility Managers. NFMs are assigned by operations directors and identified in NS-18303, "INL Nuclear Facilities and Nuclear Facility Managers." Responsibilities and the qualification program for NFMs are defined in NS-18304, "INL Nuclear Facility Manager Qualification." The NFMs are responsible for equipment, structures, activities, processes, and personnel in assigned nuclear facilities to ensure the safety of the workers, the public, the environment, and the processes.

Facility Managers. FMs are assigned by the ALD and the F&SS Director to be responsible for the equipment, structures, activities, processes, documents, and personnel in a radiological or other facility.

Facilities and Site Services Director. The F&SS Director provides leadership and direction to Safeguards & Security, Emergency Services, Engineering Services, Maintenance and Operations Services, Document & Training Systems, Radiological and Other Facilities, Research & Development (R&D) Support Services and Land Management. This directorate is organized by key service areas to provide support for world-class research and operations with the highest standards of safety, environmental protection, and efficiency.

Matrix Management. Functional support personnel can either be "deployed" or "matrixed" to an organization. Both methods are utilized to provide functional support to the activity but function differently. Deployment is when both the "how to" and the "what to do" directions are provided by functional supervision (e.g., Radiological Controls). Matrixed is when the "how to" is provided by functional supervision and the "what to do" is provided by the matrix organization supervision (e.g., Training).

The responsibilities of both deployed and matrixed functional personnel include:

- Interface with their own Functional Support Manager (FSM) on lessons learned, process initiatives, and technical difficulties.
- Implement the training and qualification process required by the Functional Support Area (FSA) for functional personnel.
- Participate in the assessment process to ensure effective implementation.
- Implement Laboratory-wide procedures in their respective FSA.
- Verify that adequate resources are available and provided to accomplish work scope.

7.2 Guiding Principle 2 – Clear Roles and Responsibilities

Work performance expectations for managers and employees are communicated in a variety of ways. General roles and responsibilities for BEA management and employees are described in PDD-9000 and in employee position descriptions (PDs).

The BEA functional management structure consists of functional support areas, as described in Section 5, "Laboratory-level Functional Support Areas." LST-1 identifies the responsible managers, functional support managers and SMEs who work closely together to ensure implementation of standards and requirements are consistent throughout the laboratory. PDD-9000 further clarifies these roles and responsibilities.

Initially, the contract requirements are translated into laboratory-level manuals, with roles and responsibilities assigned to organizations, managers and individual employees (Figure 11). Roles and responsibilities are further defined at the facility level. Activity-level roles and responsibilities are even more prescriptive and are associated with a specific job or activity. Controlled documents provide roles and responsibilities for safe performance of work at the laboratory, facility, and activity levels. Figure 11 shows documentation used to depict clear roles and responsibilities at each of the work levels.

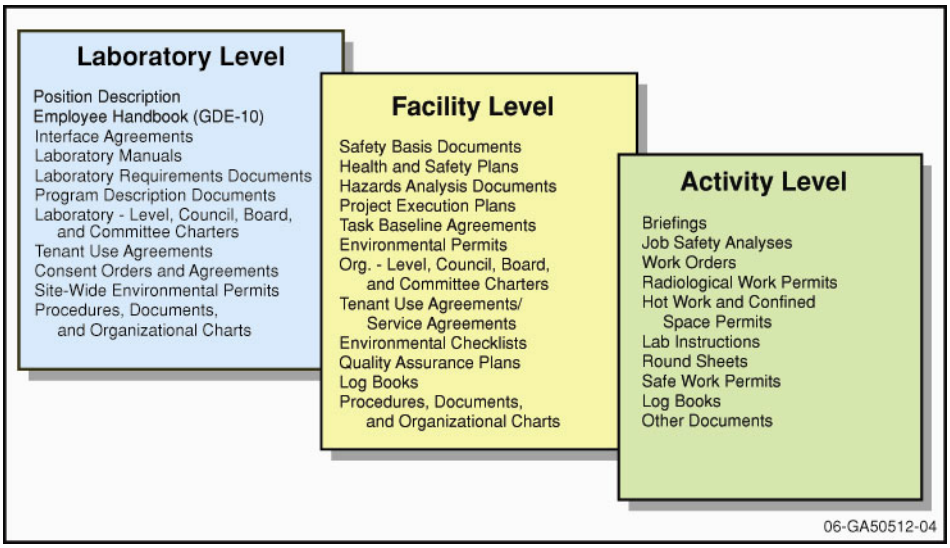


Figure 11. Roles and responsibilities.

7.3 Guiding Principle 3 – Competence Commensurate with Responsibilities

People and their professional capabilities, experiences, and values are the Laboratory's most valuable asset. INL's process for ensuring an employee has competence commensurate with responsibilities (CCR) places a high priority on recruiting, selecting, and retaining staff that have an in-depth understanding of both the safety and the technical aspects of their jobs.

The CCR process must support mission success. Six critical attributes will enable INL to reach the vision, renaissance of nuclear energy, and serve as a primary basis for INL staff competency needs beyond contractual and regulatory requirements. In abbreviated form the six critical attributes that drive CCR are as follows:

- A portfolio of nuclear sciences technology programs
- A portfolio of national/homeland security, energy, and environmental programs
- A robust science base

- Revitalization of nuclear science, technology and engineering and education and academic research
- Collaboration with academic, government, and industrial nuclear science and technology organizations
- The foremost research facilities, support infrastructure, and management systems.

The Laboratory staff currently carries out a broad spectrum of activities—from general administrative functions to operation of nuclear facilities; from bench-level experimentation to large, demonstration-scale R&D projects involving highly radioactive or hazardous materials and complex devices. Work at the Laboratory also includes paper studies conducted in general office environments, construction of new facilities, installation of new equipment, maintenance of existing facilities and equipment, and delivery of core support services such as instrumentation calibration, maintenance, grounds-keeping, and general administrative activities.

INL's diverse set of work activities dictates the need for a highly flexible and robust CCR process. The CCR requirements for processes such as work control are defined based on the risks, hazards, and complexity of the type of activity, facility, and worker. Management is responsible for understanding the specific ES&H hazards and implementing the appropriate mitigation strategies in conjunction with the applicable regulatory drivers and process requirements.

The INL CCR process (Figure 12) contains the basic elements to ensure work is performed safely by qualified workers in accordance with procedures. The INL CCR process participants include Human Resources, Training, Document Control, QA, specific review boards, and line management, signifying horizontal integration among the Laboratory functional organizations.

Laboratory procedures that support the CCR processes and tools discussed within this section include:

- LWP-12001, "Annual Training Process"
- LWP-12003, "Individual Training Plans"
- Form 361.57, "New Employee Checklist"
- LWP-12035, "Training Needs Analysis"
- MCP-36, "Job Analysis"
- LWP-12033, "Personnel Qualification and Certification"
- LWP-12002, "Site-Wide Training Analysis and Implementation"
- LWP-4002, "Service Acquisitions."

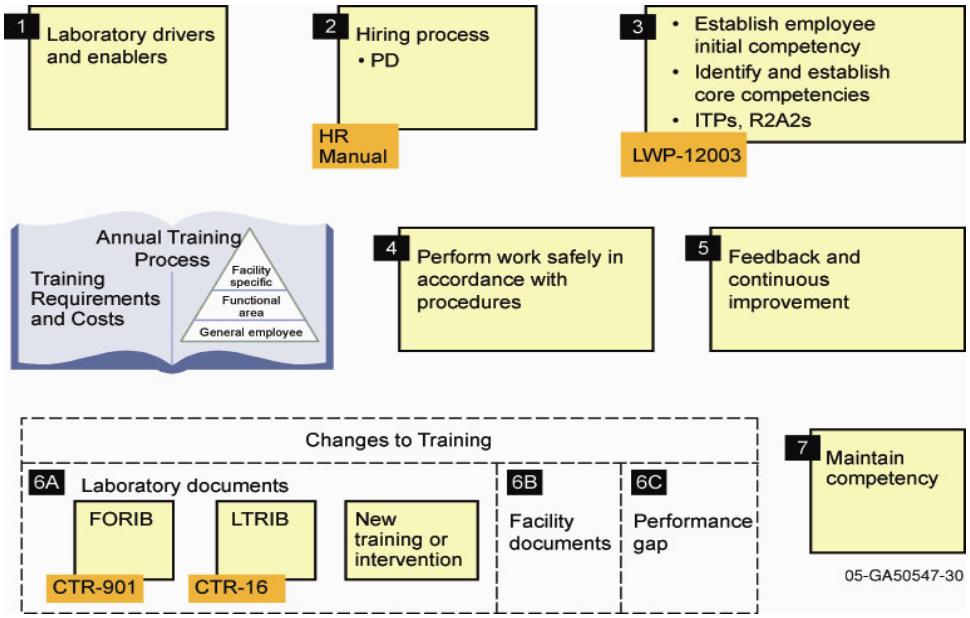


Figure 12. INL CCR process.

The elements of the Laboratory employee CCR process shown in Figure 12 are described below.

1. **Laboratory Drivers and Enablers**. Laboratory programs and management systems that are the drivers and enablers for CCR are identified. These programs are essential because they implement systems or serve as the basis for implementing systems that achieve and maintain CCR.

2. **Hiring Process**. The INL hiring process and PD ensure that an employee's job duties, necessary education, and years and types of experience required for the position are identified before an employee is hired. A PD defines the core competencies, roles, responsibilities, authorities, and accountabilities, as well as the basic knowledge, skills, and abilities required for a position. Education and experience are verified in the hiring process.

3. **Establish Employee Initial Competency and Identify and Establish Core Competencies**. Employee competency is established through the use of new employee orientation training, new employee checklists, and individual training plans (ITPs).

   ITPs define an employee's training and qualifications (initial and continuing) at three distinct levels: laboratory-wide general employee training, functional training, and facility-specific training. These three levels of training and qualifications are referred to as the three tiers of the CCR triangle, as shown in Figures 12 and 13. Figure 13 also shows common elements in training program description documents to ensure CCR.

   Underpinning ITPs is the Annual Training Process (ATP), described in LWP-12001, which provides the foundation for the establishment, assignment and management of INL training and qualifications. A product of the ATP is Book 1, "Training Requirements and Cost," that defines the training and

qualifications depicted in the CCR triangle. The ATP provides a systematic method to identify, validate, cost and schedule for existing and new training requirements. The ATP provides the basis for and documents the employee's initial training and qualifications, as well as continuing training and qualification requirements.

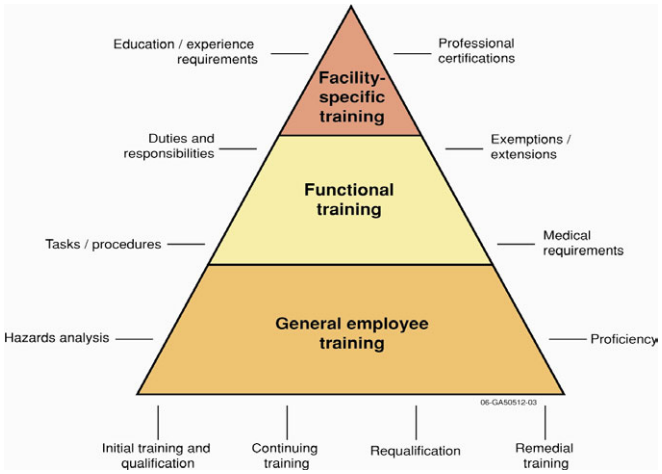


Figure 13. CCR triangle and common program description document elements.

4. **Perform Work Safely.** The employee and his/her manager verify that the employee is properly trained and qualified to perform a specific task before it is assigned. The type of work being performed defines the required level of rigor for verification of CCR. The CCR tailoring is based on the levels and types of hazards inherent to the work being performed, as well as the work control process and applicable procedures for the task being performed.

5. **Feedback and Continuous Improvement**. Actions needed to maintain and improve worker competency that originate throughout the CCR process all feed into maintenance of the process, which includes the employee's training requirements. Institutionalized laboratory QA processes provide performance feedback that is used to continually improve the CCR process. The feedback is analyzed and interventions are designed and implemented to improve processes and fill performance gaps.

   In accordance with LWP-12003, "Individual Training Plans," an annual review is conducted for each employee that includes a review and update of the employee's ITP and identification of professional development activities for the upcoming year.

6. **Changes to Training**. Every new or revised laboratory-wide document, before it becomes effective, is simultaneously presented to two review boards: FORIB and LTRIB. These two boards ensure that the document is fully ISMS-ready for implementation. Similar processes apply at the facility level.

The LTRIB also provides a systematic method to validate whether or not training is the correct intervention for a performance gap. As appropriate, the training and qualifications identified in the LTRIB process are fed into the ATP.

7. **Maintain Competency.** Lessons learned from work performed, performance indicators, and other feedback mechanisms all support the maintenance of CCR. Continuing training and re-qualification programs defined in an employee's ITP are completed to maintain employee competency. CCR maintenance also includes individually assigned professional development efforts such as continuing education, seminars, and workshops.

7.3.1 Subcontractor CCR Process

INL utilizes a risk-based approach to subcontractor CCR as outlined in LWP-4002. For staff augmentation, the requestor of the subcontractor is responsible for ensuring the worker has the training and qualification relative to the work scope being performed. Obtaining services other than staff augmentation is outlined in Appendix N of LWP-4002. The Subcontract Technical Authority (STA) ensures the subcontractor receives ES&H awareness training as a minimum. Additional training is provided to the subcontractor, as appropriate, for specific job and facility hazards and requirements as described below.

- For work considered minor maintenance with minimal hazards, an Activity Hazard Analysis (or equivalent) is used to document additional ES&H training requirements. The STA and industrial safety representative verifies subcontractor training completion throughout the life of the contract.
- Subcontractor work that will be performed in a potentially hazardous environment requires the involvement of the Subcontract Formation Group (SFG) including the assignment of a Subcontract Technical Representative (STR) or Construction Field Representative (CFR) (for construction activities). The SFG identifies potential hazards, documents requirements, and ensures the subcontractor understands them. The subcontractor utilizes the JSA process (or equivalent) to outline how the work will be performed and how requirements will be met. The STA or STR/CFR verifies subcontractor training completion throughout the life of the contract

In summary, a number of institutionalized controls and processes are in place to ensure that an employee has the requisite CCR. Figure 14 depicts the CCR components as a set of defenses. The defenses are a blend of objective controls (e.g., training that concludes with a knowledge-based examination or demonstration of proficiency) and cultural components (e.g., how thorough a person chooses to conduct a brief). The figure highlights how CCR defenses are integrated with a number of core functions and guiding principles. As an example, supervisory oversight is part of the Guiding Principle 1- Line Management Responsibility for Safety.

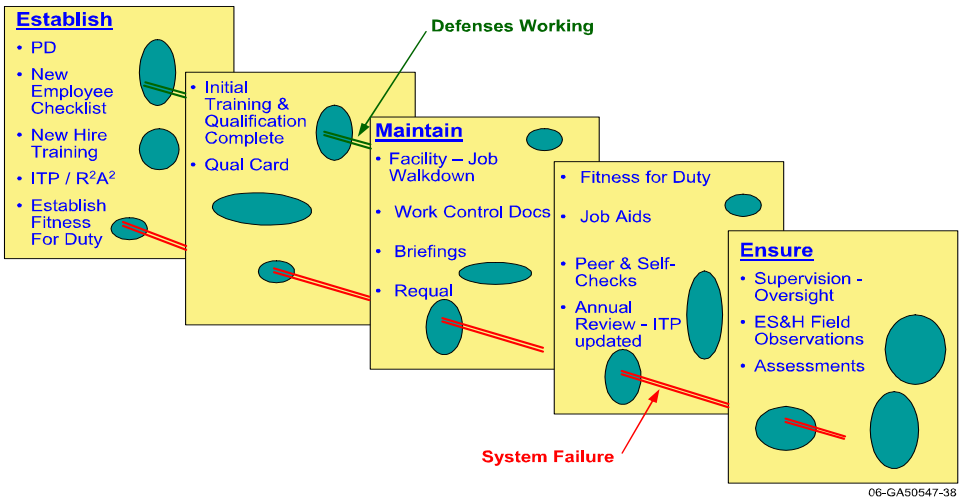


Figure 14. CCR defense in depth.

7.4 Guiding Principle 8 – Employee Involvement

Employee involvement is a key to the success of BEA's ISMS. Employees are actively involved in the planning processes and in executing work, as well as in providing feedback to management initiating improvements as necessary. Employees contribute to the hazard identification and mitigation processes in a number of ways (e.g., inspections, planning work activities, self assessments, corrective actions, behavioral observations, direct feedback to management, procedure review, and reporting deficiencies).

In further establishing a "safe-work culture" at INL, employees are encouraged by line management to be actively involved in safety and to participate and contribute to the overall safety program. Work activities are undertaken with full understanding by each employee involved that they are individually responsible for their own safety and the safety of others.

The VPP effort has enabled the workforce to be directly involved in all aspects of safety and health at INL. Some of the more significant avenues of involvement include:

- Employee safety teams (ESTs)
- Behavior-based safety observations (e.g., Safety Observations Achieve Results [SOAR])
- Annual Safety and Health program evaluation and corrective actions
- Job-specific walkdowns, briefings and follow-up reviews
- Activity/job hazard analysis development, review and validation
- Management and EST participation in inspections
- Participation in injury and illness investigations and area inspections
- Reporting safety concerns.

The LEST comprises the chairpersons from the geographic and/or organizational ESTs. Each of the ESTs accomplishes the tasks as required by the VPP onsite criteria. There are several sub-tier ESTs, such as the Fire Department and the Bus Drivers that interface and report directly to the geographic/organizational EST. Figure 15 depicts the composition of the INL VPP EST infrastructure.

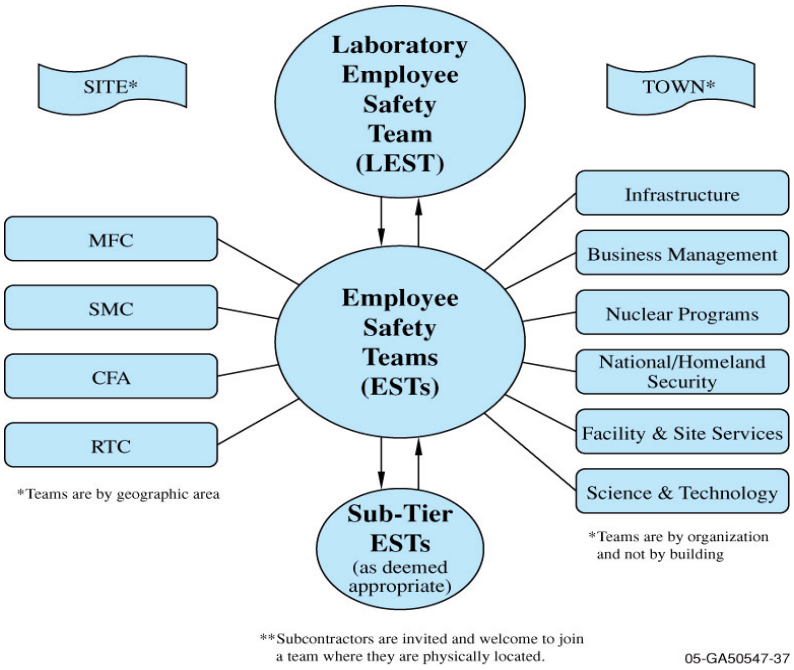


Figure 15. INL VPP employee safety team infrastructure.

7.4.1 Safety Observations Achieve Results

It is the strategy of the INL to establish and sustain a Behavior Based Safety (BBS) process to significantly impact workplace at-risk exposures and injuries. The SOAR process promotes safe work practices through enhanced employee awareness. SOAR is an employee involvement and worksite analysis tool within the VPP and it supports the INL vision of an injury-free workplace by reinforcing safe behaviors and eliminating at-risk behaviors.

The INL SOAR process provides a way to measure observed behaviors against defined standards. Observation and feedback discussions are the essence of the process and provide mechanisms for positively reinforcing safe behaviors and seeking commitments to improve at-risk behaviors. The aim of the observation and feedback process is to prevent exposures and injuries in the workplace. It is a proactive approach to safety performance improvement. Implementation is achieved with trained observers committed to performing observations with a workforce that accepts safety as a value. The essential elements of the SOAR process includes the involvement of all employees, one-to-one feedback, the collection of observation data, data-driven decision-making processes, and management's visible, on-going support.

7.4.2 Other Employee Involvement Processes

Other BEA processes ensure employees are aware of their roles and responsibilities in regards to safety.

- Employees actively participate in developing and changing the work guidance documents and processes they are required to follow.
- Employees clearly understand that they not only have the right, but also the obligation to take a timeout or initiate a stop work action (i.e., LWP-14002, "Timeout and Stop Work Authority") at any time when a potentially unsafe condition is identified.
- Employees participate in job-specific walkdowns, briefings and follow-up reviews to continuously improve job and safety performance.
- During development and review of laboratory instructions or use of existing JSAs, employees identify job-specific hazards and appropriate hazard controls.
- Management and employee involvement in inspections provides opportunities to address and mitigate unseen hazards that may exist to increase worker awareness of the physical condition of work sites/areas or facilities.
- Employees are taught to understand that they are required to follow established processes or work guidance documents for the work being undertaken through a number of mechanisms such as training, and documented procedures.
- Employees participate in pre-job planning through several mechanisms.
  - LWP-6200, "Maintenance Integrated Work Control" applies to Maintenance Management activities.
  - LWP-21220, "Work Management" applies to R&D and Operations activities.
  - LWP-7201, "INL Construction" applies to Construction activities.
  - LWP-9201, "Briefings," applies to all personnel performing or supervising operational, maintenance, or construction work activities, and includes the requirements for performing pre-job briefings.
  - Requirements document (RD) -1007, "Work Coordination and Hazard Control" applies to subcontractors.
- Employees are encouraged to present Safety Shares at meetings.
- Employees participate in many of the councils, committees, and boards described earlier in Section 3.6, for example the Hoisting and Rigging and Electrical Safety and Work Practices committees.

- All personnel, employees and subcontract employees, are encouraged to participate in the feedback and improvement processes described in LWP-9201, LWP-6200, and LWP-21220.
- Employees are encouraged to have ergonomic and industrial evaluations of their workstations.
- Employees are expected to attend Safety Meetings.

7.5 Core Function 1 – Define Scope of Work and Guiding Principle 4 – Balanced Priorities

A well-defined scope of work, together with related cost and schedule elements, is vital to the ISMS because it:

- sets the stage for the scope and depth of hazards identification analysis, and work controls
- is the primary factor in establishing expectations and accountability
- is the foundation for the budget formulation allocation process to determine key ES&H resources.

7.5.1 Defining Work/Balancing Priorities at the Laboratory Level

The basis for defining the Laboratory's work scope is the INL mission. This mission guides the strategic actions, resources, and infrastructure activities of the Laboratory. Priorities are balanced to safely accomplish the mission. A well-defined scope of work at the laboratory level is essential for proper alignment and balancing of program, facility, and infrastructure activities.

Proposed work scope for work to be performed at the Laboratory is aligned with the Strategic Plan and screened for risk prior to requesting funding.

Important to mission accomplishment is the INL's infrastructure. The *INL Ten-Year Comprehensive Site Plan* defines resource requirements that are necessary to meet INL's mission and comply with DOE O 430.1B, *Real Property Asset Management*. The overall objective of the infrastructure program is to anticipate, deliver, and maintain facilities, equipment, and services important to INL in achieving its programmatic and compliance goals. Infrastructure activities are prioritized and balanced through the INL IRB.

7.5.2 Defining Work/Balancing Priorities at the Facility Level

Work plans, developed through those processes described in Section 8, become the basis for facility- and program-level activities. The plans establish the high-level work activities, proposed schedules, and milestones for the scope, responsibility, and accountability for accomplishment. Subsequently, these high-level activities are then structured into finite tasks and detailed in short-range work schedules such as the Plan-of-the-Week.

R&D projects are structured into the different activities, such as chemistry or laser operations, that will be used during the project. These different activities become the basis for laboratory selection and the subsequent hazard analysis and control.

7.5.3 Defining Work/Balancing Priorities at the Activity Level

Activities identified to be performed for R&D and Operations enter the Work Management System (LWP-21220) through a variety of methods. The primary methods are through the Project Management System (new activity) or through the need to make a change to an existing activity. In both of these, the work scope is broken into specific tasks and locations to complete the activity. Throughout the Work Management process, the work scope is revisited, as needed, to ensure new information or insights have been incorporated.

Activities to be performed for Maintenance enter the Work Control Process (LWP-6200) in the form of Work Requests. These Work Requests are screened based on skill required to perform as well as risk/hazard of the activity. Those activities requiring planning are walked down to determine the work scope and conditions. The work scope is broken down into specific tasks and locations to complete the activity. Prior to initiation of work, the work package is walked down to ensure conditions have not changed and the package can be performed as written.

Activities to be performed by Construction Management under the Work Control Process (LWP-7201) are requested in a variety of methods. The primary methods are through the Project Management System via a PEP (Project Execution Plan) or a written or verbal request from a number of customers throughout the INL. Each project is evaluated by the project team to determine the level of rigor associated with all construction activities. The evaluation is completed utilizing Commercial Practices Graded Application Matrix. The rigor associated with all projects is then passed to the subcontractor through such contract documents as specifications, drawings, special conditions, general provisions, and the SRM (Subcontractor Requirements Manual). Prior to initiation of any construction project it is the subcontractor's responsibility to provide construction management with Health and Safety Plans (JSAs, etc.) that address hazards and hazard mitigation. All projects are thoroughly walked down by the subcontractor, construction management personnel and construction safety to ensure that all hazards (including facility hazards) have been identified and properly mitigated.

7.6 Guiding Principle 5 – Identification of Safety Standards, and Requirements

Requirements flow down from the source requirement documents to the laboratory-level processes and procedures and, when appropriate, down to the project-specific documents. The laboratory-level requirements are contained in manuals as discussed in Section 5 for the Laboratory-level Functional Support Areas. These requirements are incorporated into appropriate implementing documents, and are tailored, as appropriate for facility-specific

circumstances to the life-cycle phase of the facility. Figure 16 shows how requirements are managed at all levels of the Laboratory.

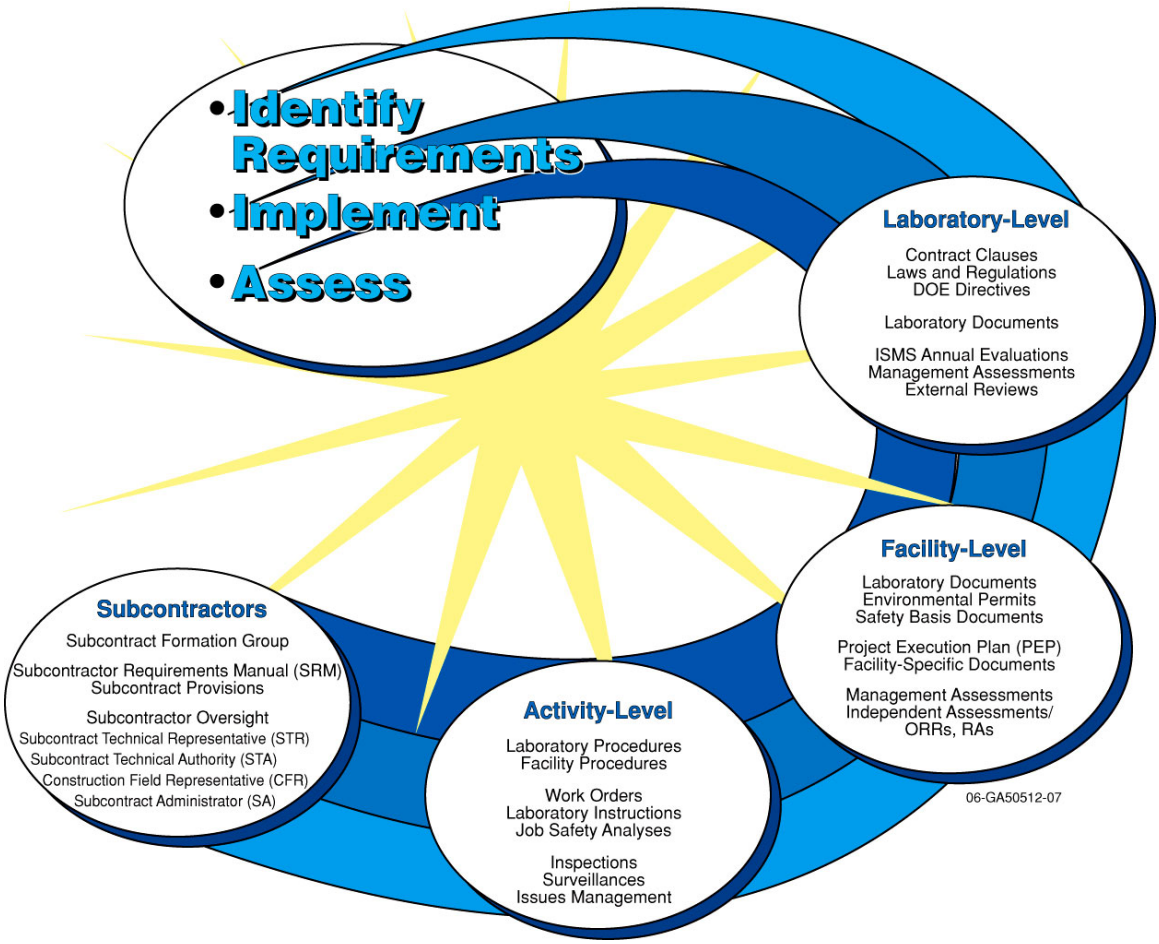


Figure 16. INL requirements management.

Identification of safety standards and requirements begins with the development of a set of requirements primarily identified in laws and regulations (formerly known as "List A") and DOE directives, List B contained in the INL contract (DE-AC07-05ID14517), and also includes requirements identified in such overarching documents as the scope of work and contract clauses. These requirements form the basis for the development of work processes, guided by the ISMS guiding principles and core functions that permeate the INL organization from leadership management, through the facilities and activities to the employee, with a primary focus on the employee. List B can be found on the INL intranet, and includes the DOE directives that contain requirements relevant to the scope of work under the contract. In most cases, the requirements applicable to the contract are contained in a Contractor Requirements Document attached to the DOE directive. Appendix B is a flow diagram of the Laboratory Requirements Management process.

LWP-1601, "Requirements Management" establishes and sets forth the processes whereby BEA ensures requirements such as laws, regulations, and DOE directives are evaluated and, if applicable, integrated into affected work processes. Programmatic

requirements flow down from contractual requirements and from applicable laws, regulations, consent orders, environmental permits, and industry standards. Laboratory-level programs that implement these requirements are institutionalized by the functional support areas through laboratory-level processes, which define the roles and responsibilities for implementing the associated requirements. The institutionalized requirements documents include a strong focus on the responsibilities of line management for functional area performance.

LWPs, MCPs, technical procedures, analytical chemistry laboratory procedures, analytical chemistry methods procedures, and emergency, abnormal operating, and alarm response procedures include procedure bases consisting of requirements, significant operating practices, and relevant research information that serve as the foundation, or basis, for developing a procedure. As a tool for authors, managers, reviewers, trainers, and procedure users, the procedure basis provides a means to ensure that a procedure meets the letter and spirit of the requirements implemented in the procedure. Because procedures are living documents, subject to change, the procedure basis also serves as the primary tool to protect the technical accuracy and integrity of the procedure during the revision process. Standard (STD) -7 "Procedure Basis Development," explains how the procedure bases are developed and used.

7.7 Core Function 2 – Identify and Analyze Hazards; Core Function 3, Develop and Implement Hazard Controls; and Guiding Principle 6 – Tailoring Hazard Controls to the Work

The objective of hazard identification, analysis, and control is the safe accomplishment of the INL mission by eliminating or mitigating hazards to protect the workers, the public, the environment, and the INL facilities and programs.

The INL has developed a number of viable and proven mechanisms to meet this objective. These mechanisms exist at the laboratory, facility, and activity levels and have been tailored to the different work functions and work areas of INL. They employ a hierarchy of controls, as outlined in DOE O 440.1A, *Worker Protection Management for DOE Federal and Contractor Employees*, to ensure that hazard exposures are minimized or mitigated. Engineered solutions are the first consideration, followed by administrative controls, with personnel protective equipment (PPE) used as a last choice.

These multilevel mechanisms have been structured and integrated to protect employees from the activity's hazards (DOE O 440.1A) as well as protect the public, environment, laboratory, and facilities. Figure 17a illustrates the processes and strategies of hazard identification and controls at all levels of the Laboratory.

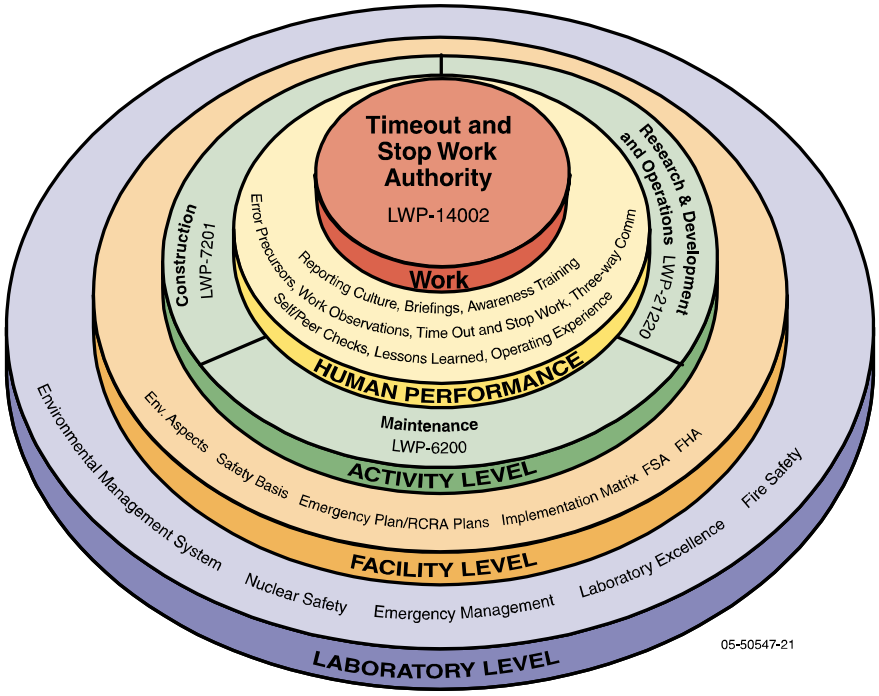


Figure 17a. INL hazard identification and controls.

7.7.1 Hazard Analysis and Control at the Laboratory Level

Hazard identification, analysis, and control begin with the identification of applicable ES&H standards and requirements that are derived from a number of sources. These standards are used to determine the minimum level of controls that must be in place before work is authorized to be performed. These core standards and requirements are established through the Requirements Management System (RMS), which is discussed Section 7.6 They are the core of the INL envelope for safety and compliance.

- DOE Directives (List B)
- Federal codes and standards
- Consensus standards
- State and local laws and ordinances
- Corporate and laboratory policies.

Core requirements are implemented and promulgated through laboratory-level programs and systems, which are illustrated in Figure 17b and described in Section 5.

Laboratory-level programs and systems establish the framework, limits, and controls for maintaining facilities and activities within the INL safety and compliance envelope.

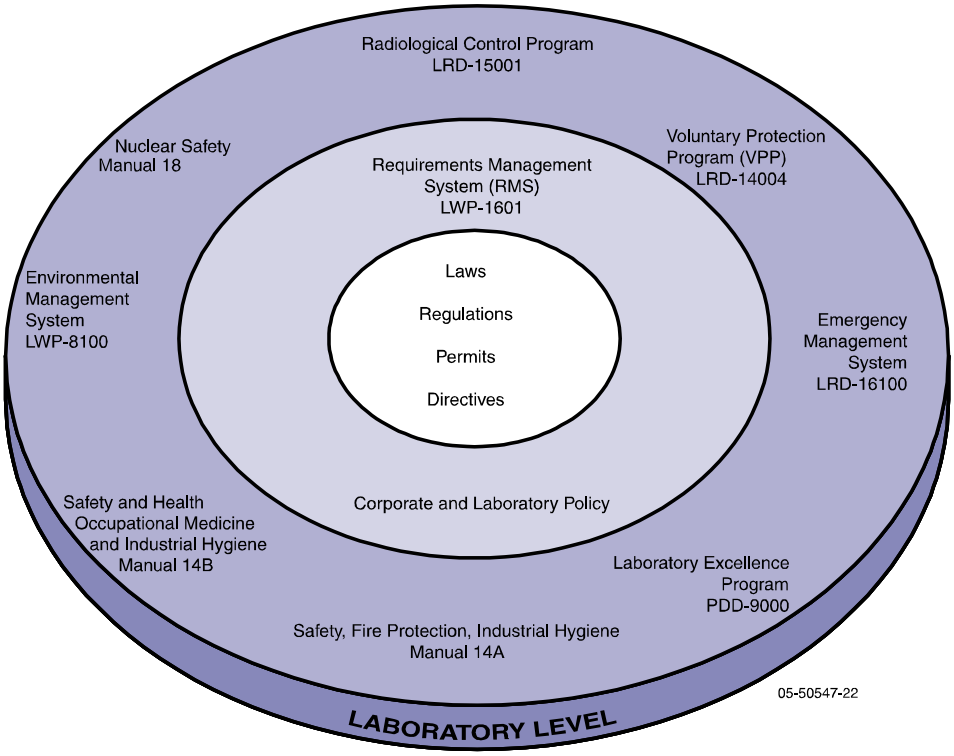


Figure 17b. Laboratory-level hazard identification and control.

7.7.2 Hazard Analysis and Control at the Facility Level

Within the framework of INL safety standards and requirements, facility hazard categorization and analysis establishes the safe work envelopes for hazardous INL facilities, as shown in Figure 17c.

The type and extent of each safety analysis and its associated documentation is determined by the hazard categorization of the facility. The hazard categorization process, based on an assessment of the facility and activities, is used to first determine whether the facility contains radiological inventory and, if so, the facility is categorized as either a Hazard Category 3 and above, or Radiological and other than nuclear facility (i.e., Less Than Hazard Category 3 [LTHC 3]). If no radiological inventory exists, the facility does not require nuclear hazard categorization.

The design and configuration of INL facilities is an essential element in removing and/or controlling facility hazards. The Engineering processes discussed in Section 5.3 enable safety professionals and line workers to work with engineers to analyze and eliminate or mitigate hazards during new design efforts or modifications; the goal being to remove the hazards if possible. Subsequently, the configuration management processes described in Section 5.4 provide documentation of the facility's configuration, an essential element in identifying and mitigating facility hazards.

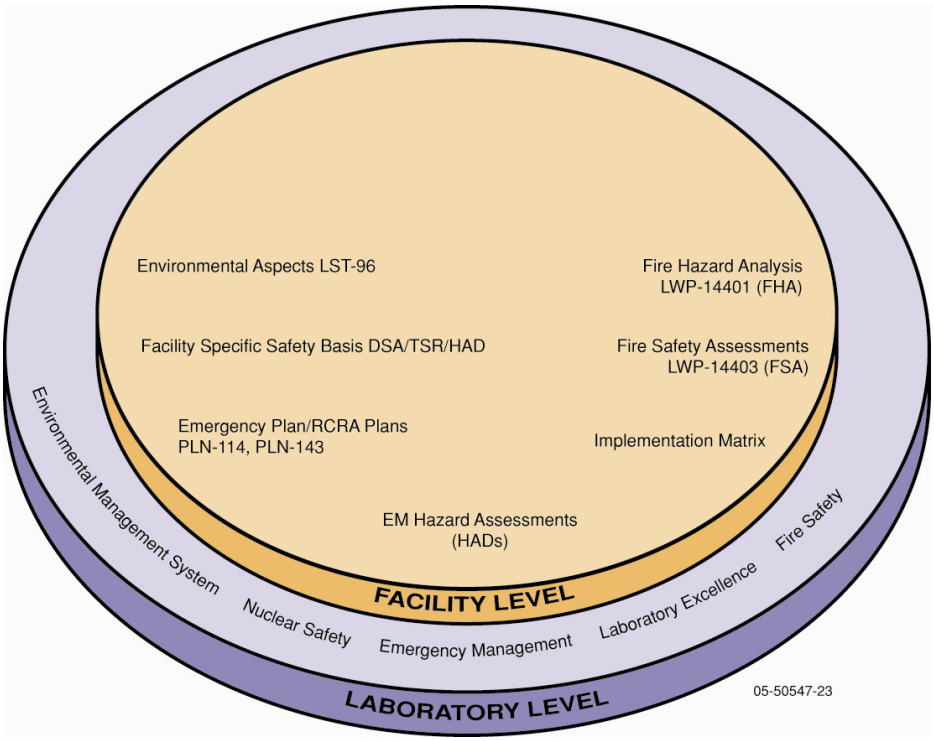


Figure 17c. Facility-level hazard identification and control.

Facility-specific Safety Basis Documents.

DSAs, TSRs, and hazard assessment documents (HADs), document the results of the safety analysis and related controls. Manual 18, *Nuclear Safety Program*, describes the suite of processes used to categorize facilities, analyze hazards, and develop nuclear facility safety controls. Additional facility-specific safety basis documents include:

Fire Hazard Analyses (FHAs), described in LWP-14401, "Performing Fire Hazards Analysis," consist of focused reviews of the nuclear facility fire hazards together with prevention and mitigation measures. An FHA is a significant contributor to safety basis documents.

Fire Safety Assessments (FSAs) are a similar review for significant other than nuclear facilities. An Abbreviated Fire Assessment (AFA) is completed for less complex facilities. The FSA and AFA are described in LWP-14403, "Performing Fire Safety Assessments/Abbreviated Fire Assessments."

Emergency Management Hazards Assessments provide the technical basis for the extent and scope of emergency planning and preparedness activities, including facility emergency action levels. MCP-2398, "Developing and Maintaining Emergency Management Hazards Assessments," describes the Emergency Management hazards assessment process.

Emergency Plans provide the methods for emergency response. PLN-114, "INL Emergency Plan/RCRA (Resource Conservation Recovery Act) Contingency Plan," describes the overall process developed to respond to and mitigate consequences of emergencies that might arise at INL. This document consolidates all federal, state, and local emergency plan requirements into one emergency plan/RCRA contingency plan.

Environmental Evaluations of INL activities, products, and services identify the environmental aspects that may have a significant effect on the environment or public, or may result in a noncompliance with regulatory requirements. LST-96, "Environmental Aspects of INL Work Activities," identifies activities that have environmental aspects, the significance of the activity, and the principal environmental controls used to mitigate and monitor potential impacts.

The INL Laboratory Excellence Program (PDD-9000) provides base requirements and guidance for conduct of work at the INL. Implementation, left to the individual facilities and functional areas, is defined in facility or functional area implementation matrixes.

7.7.3 Hazard Analysis and Control at the Activity Level

LRD-14005, "Activity Level Hazard Identification, Analysis, and Control," invokes the procedures required to implement the activity-level hazard identification, analysis and control processes. LRD-14005 specifies the requirements for identification, analysis, and control of ES&H hazards for work planning and execution at the activity level that flow down from contractural documents into laboratory-wide procedures. As shown in Figure 17d, within the program there are three primary hazard identification analysis and control processes that have been developed (LWP-21220, LWP-6200, LWP-7201). These processes meet the requirements of DOE Order 440.1A and DOE G 450.4-1B.

INL activity-level hazard identification and mitigation is conducted utilizing one tool for R&D and Operations and Maintenance. The tool is embedded within LWP-21220 as the *Hazard and Risk Planning System (HaRPS)*. This tool queries the author of the work instruction on a series of questions to determine the applicability of environmental, safety, industrial health, and security requirements. The outcome of the process yields activity planning information that is specific to identified work scope. This planning information contains mitigation controls, training requirements, SME contacts, and any other pertinent planning data. USQ and Quality determinations are embedded in LWP-21220.

Research & Development and Operations:

LWP-21220 integrates environmental, safety, industrial health, and quality reviews into the laboratory instruction review process, providing a comprehensive evaluation of the multifaceted aspects of R&D and Operations for the INL.

Maintenance:

LWP-6200 is the maintenance work control process for the INL. It provides the method for consistently screening maintenance work activities to uniform criteria to ensure that hazards are appropriately identified, analyzed, and controlled.

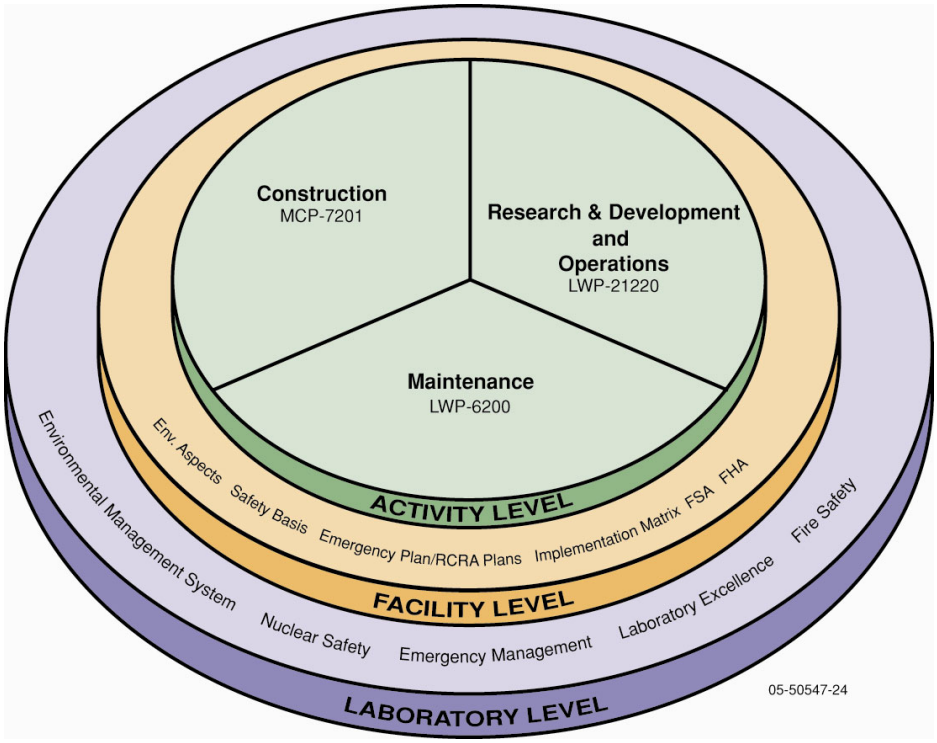


Figure 17d. Activity-level hazard identification and control.

Construction (including subcontractors):

LWP-7201, "INL Construction," provides the processes for identifying, analyzing, and controlling the hazards for construction activities at the INL. It invokes the use of RD-1007, "Work Coordination and Hazard Control, which provides requirements for coordinating work and controlling the hazards associated with work performed by subcontractor personnel, including Construction.

Fundamentally, these activity-level hazard identification, analysis, and control mechanisms are similar and include the following characteristics:

- Apply a graded approach
- Implement the five core functions of ISMS
- Use hazard checklists to help identify and mitigate laboratory, facility, and activity hazards
- Prescribe applicable precautions, limitations, and prerequisites
- Involve workers and use work-area or job-site walkdowns

- Use interdisciplinary reviews as appropriate for the specific tasks
- Preserve the safety basis of a nuclear entity through the Unreviewed Safety Question (USQ) process (LWP-18001).

These mechanisms help to identify and integrate laboratory-, facility-, and job-specific hazards and controls to provide front-line personnel with cohesive and integrated work instructions.

7.7.4 Human Performance Improvement

Human Performance Improvement (HPI) is an approach to obtain excellent worker safety and productivity. HPI is based on five key principles (INPO 1997):

- People are fallible, and even the best make mistakes
- Error-likely situations are predictable, manageable, and preventable
- Individual behavior is influenced by organizational processes and values
- People achieve high levels of performance based largely on the encouragement and reinforcement received from leaders, peers, and subordinates
- Events can be avoided by understanding the reasons mistakes occur and applying the lessons learned from past events

Organizations that embrace HPI principles use specific concepts and tools to achieve excellent worker safety and productivity.

As reflected in Figure 17e, the INL plans to integrate HPI concepts and tools at four levels—laboratory, facility, activity, and human.

In FY-06 the INL demonstrated its commitment to HPI by launching the "start-up" phase of HPI implementation. A formal "Center for Human Performance" was established. The Center developed and piloted several HPI tools. In FY-07 the Center will begin to institutionalize HPI tools and concepts into laboratory-wide processes.

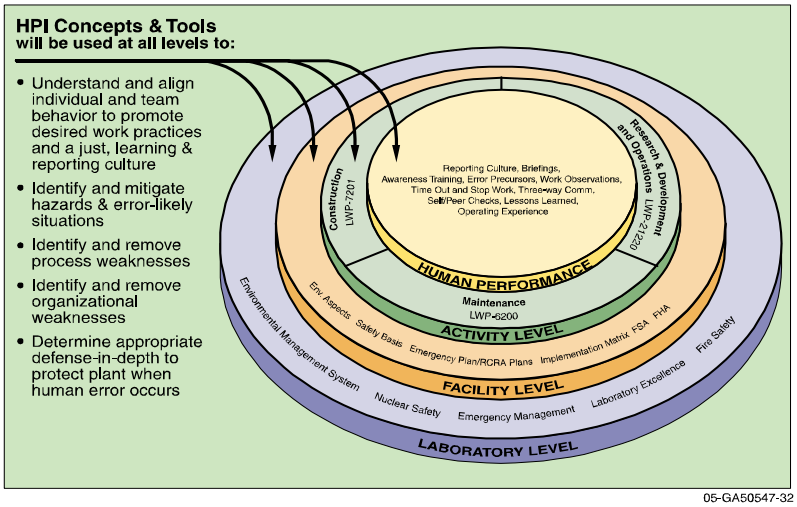


Figure 17e. Human performance integration.

7.8 Core Function 4 – Perform Work and Guiding Principle 7 – Operations Authorization

Work is authorized and performed at the INL through formal processes as described below.

7.8.1 Authorizing and Performing Work at the Laboratory Level

The INL contract provides BEA legal authority to plan and conduct the INL work scope. Such work includes R&D and operations, maintenance, and construction. It also includes a broad scope of activities such as studies, planning, engineering, design, and environmental sampling. The safety controls for all work are derived from DOE Orders and other regulations invoked in the contract and implemented in laboratory-level procedures.

The INL Strategic Plan, approved by senior line management, addresses Laboratory missions as defined in the contract. The Laboratory Agenda summarizes the INL Strategic Plan and authorizes the development of lower-tier functional area plans and program directorate business plans for performing work.

This work includes business and budget activities, establishing Laboratory management systems and processes, laboratory-wide environmental monitoring and evaluation activities, etc. The INL Laboratory Director provides the overall leadership and direction by setting the mission, vision, direction, and strategy for accomplishing the scope of work.

7.8.2 Authorizing and Performing Work at the Facility Level

The work performed at the facility level generally establishes the operating bounds of the facility, such as the safety basis document, fire hazard analysis, and project environmental hazards and controls. The authorization to perform this work flows through the various functional support area programs.

Authorization Agreements

INL authorization agreements are documented agreements between the DOE and BEA for the safe operation of Hazard Category 1 and 2 nuclear facilities. The authorization agreement describes the terms and conditions under which the Laboratory is authorized to operate its nuclear facilities. Hazard Category 1 and 2 nuclear facilities are identified in Nuclear Safety (NS) -18303, “INL Nuclear Facilities and Nuclear Facility Managers.” The authorization agreement is reviewed and approved by senior Laboratory and DOE-ID management in accordance with NS-18306, “INL Authorization Agreement Development.” The authorization agreement is maintained by the NFM and is kept with the DSA for easy access by operations personnel.

Developing an authorization agreement is the responsibility of the NFM; however, the NFM should obtain input and concurrence from appropriate facility SMEs and appropriate management before a draft authorization

agreement is submitted to Laboratory senior management and DOE-ID for approval. Authorization agreements will be revised or cancelled, as appropriate, when there is a major change in facility activities, such as a changed mission, changed operating limits, changed permits, or the documents listed in the authorization agreement are replaced. Each authorization agreement requires an annual review.

A significant element of an authorization agreement is the safety basis documents (DSAs and TSRs). The life cycle of a nuclear facility (see Figure 18) is one of enhanced standardization, rigor, and discipline because of the hazards and accidents that are inherent with these critically important processes that support the defense of the United States. The requirements for nuclear facilities including the safety basis documents, DSAs and TSRs, are established in the Nuclear Safety Management Rule (10 CFR 830).

These two safety basis documents dictate the inner workings and mechanisms of the facility; hazards/accident analyses with mitigation; safety structures, systems, and components; derivation of TSRs; and ISMS characteristics. A nuclear facility will always be "enveloped" by these documents; otherwise the operational processes will be placed in a safe condition until the disparity between the DSA/TSR and the facility is resolved. In that the DSA/TSR is both developed and maintained by the contractor, the DOE management official for a nuclear facility (referred to as the approval authority) must have a formal vehicle by which to authorize changes to the safety basis documents initially and over the life of the facility.

The approval authority has the specific responsibility of ensuring the review and approval process represents all DOE entities with vested interests in the facility under review and considers commitments made to agencies outside DOE. The Safety Evaluation Report (SER) is the management document that provides the approval authority with the basis for the decisions related to the extent and detail of the review of the DSA and TSR. The SER also provides any conditions of approval that the contractor will address prior to facility or activity operation. SERs also document the basis for approving revisions to DSAs/TSRs, including annual updates.

The final process involved in the "maintenance of a safety basis" is the unreviewed safety question (LWP-18001). This process, which is specified in the Nuclear Safety Management Rule, and approved for each nuclear site by the DOE, enables the contractor to communicate with their approval authority regarding issues associated with the facility's safety basis.

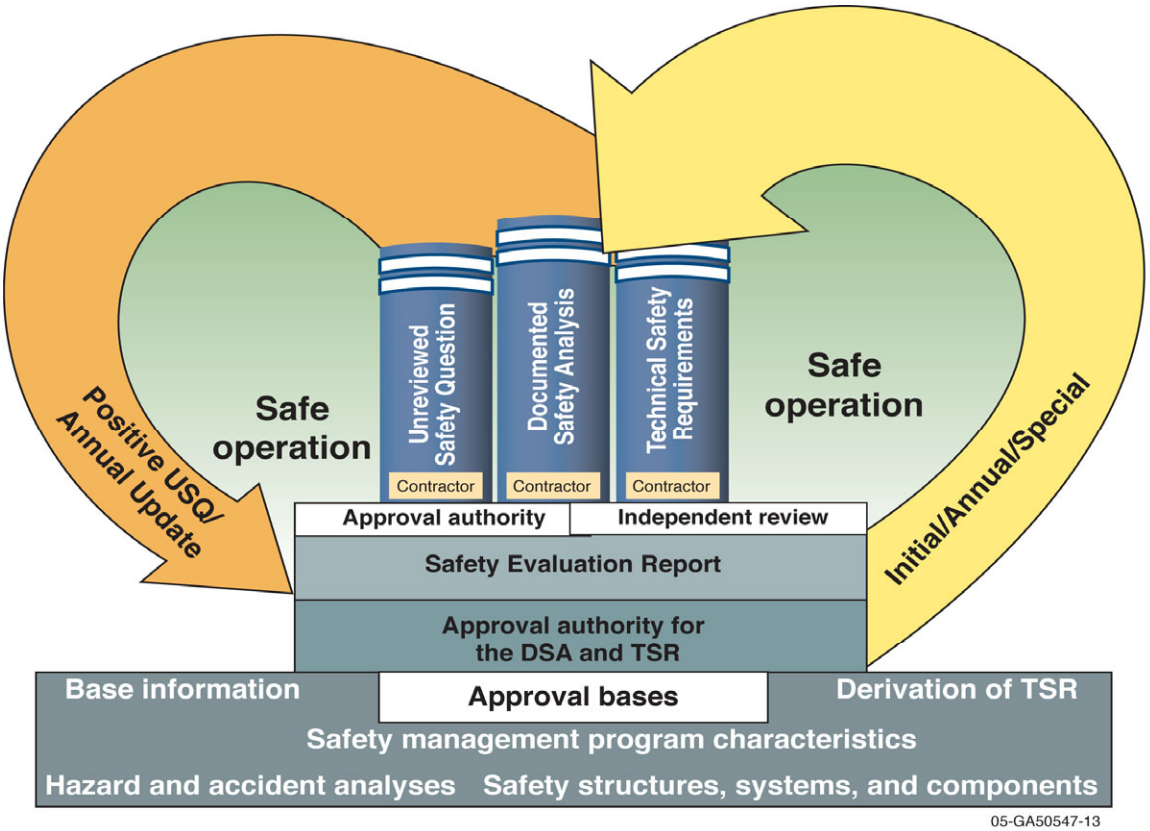


Figure 18. Life cycle of facility safety basis documents.

7.8.3 Authorizing and Performing Work at the Activity Level

Accomplishing work safely at the activity level is the end result of the planning, budgeting, scheduling, analysis, evaluation, and management activities described in this document up to this point. Goals for accomplishing the mission of the INL will be met by safe performance of activity-level work. This work is authorized and monitored for safe performance by line management, as discussed in Section 7.7 and described in PDD-9000. Line management ensures the proposed activity will be conducted in compliance with facility/project requirements, such as safety basis documents, and environmental regulations and permits, by appropriately trained and qualified personnel following approved work control documents or instructions. Activities are conducted in accordance with the Laboratory Excellence Program (Manual 9), to provide the framework for safe and efficient research, operations and other supporting activities. This framework, based upon DOE O 5480.19, implements a proven philosophy for the safe operation of all facilities and activities.

Activities that affect nuclear facilities undergo the unreviewed safety question process (LWP-18001 “Unreviewed Safety Questions”) prior to starting a proposed activity to determine if it poses the type of change that requires a detailed review in accordance with 10 CFR 830.203. If it does, a further evaluation is performed to determine if the proposed activity can be

accomplished within the established safety basis. If not, DOE approval is required.

All R&D and operations, maintenance, and construction activities require briefings to be conducted prior to commencing an activity to ensure all participants understand the scope of work, hazards, mitigations, and responsibilities. LWP-9201, "Briefings," provides the process for conducting, and documenting feedback identified during the performance of the activity. Human performance tools for enhancing the briefing are provided. A briefing is the final confirmation of readiness before initiating an activity.

Regardless of complexity, activities are undertaken with full understanding by each employee involved that they are individually responsible for their own safety and the safety of others involved in or affected by the activity. Personnel are qualified through training and experience to perform the assigned activity. They understand that they are required to follow established instructions or work control documents for the activity being undertaken. They also actively participate in developing and changing the instructions or work control documents they are required to follow. Personnel clearly understand that they not only have the right, but are obligated to stop work (LWP-14002, "Time Out and Stop Work") at any time if they are aware that a potentially unsafe condition exists.

7.9 Core Function 5 – Feedback and Improvement

Feedback and improvement is implemented through five management and assurance functions implemented across three assurance levels. This design drives aligned mission performance throughout the INL, and enables corporate and contractor assurance (see Figure 19). The five functions are:

7.9.1 Plan

Both strategic and operational plans describe the direction and objectives to be pursued to accomplish work. All plans emanate from the INL Strategic Plan and define their role in helping implement strategic objectives. The Strategic Plan informs R&D business planning, which in turn provides direction for infrastructure plans (i.e., staffing, physical infrastructure, management system, and information technology plans), program plans and project plans. Plan performance is periodically reviewed, objectives revisited, and revisions are codified in updated plans that are effectively communicated.

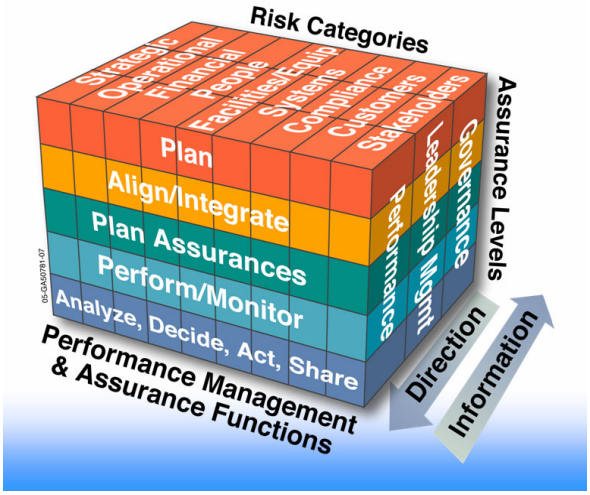


Figure 19. Performance management and assurance functions

7.9.2 Align/Integrate

Plans are reviewed to ensure that they are aligned with INL's strategic direction and integrated with each other. To ensure that resources are appropriately identified for plan execution, plan priorities drive the annual budgeting process. Strategic investment requests (e.g., org. management/G&A, LDRD, PDF, IGPP/IGPCE, and direct funds – including GPP/GPCE) are rigorously reviewed and allocated accordingly across organizations and management systems. Another key aspect of alignment involves ensuring that all plans developed at lower levels of the organization reflect the priorities of those above them – all of which audit back to objectives in the Strategic Plan.

7.9.3 Plan Assurances

To effectively plan and achieve an objective, objective owners must have a clear understanding of the customers, outputs, processes, inputs, suppliers, requirements, and risks/controls associated with the objective. Armed with this information, objective owners identify a small number of valid, reliable measures and targets that provide the basis for measuring and monitoring performance and risks. In addition, objective owners identify optimal information collection sources for those measures. Sources include assessments of various kinds, audits, surveillances, management walkthroughs, routine performance measures, operation experiences, information, observations, peer reviews, etc.

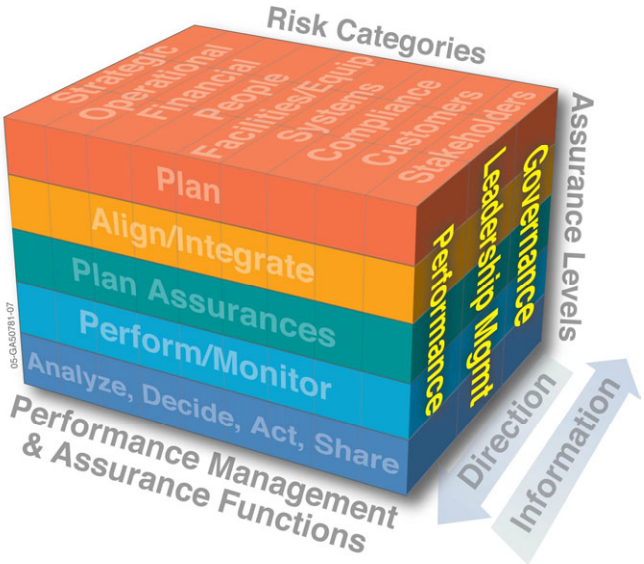
7.9.4 Perform/Monitor

Performance assessment plays a pivotal role in providing the information necessary to measure the effectiveness with which objectives are being implemented and risks prevented or mitigated. Assessments are fundamental to effective leadership and management at the INL, and are used to evaluate how well business is managed, not simply to monitor compliance. Assessments are the basis for ensuring that the right people obtain the right information at the right time for effective decision-making and action. A goal of assessments is to find performance problems before they find us.

7.9.5 Analyze, Decide, Act, Share

To be of value in helping the INL effectively manage performance, information resulting from performance assessments against planned assurances must be analyzed and converted into actionable information. The analysis involves identifying deviations from expected performance (both negative and positive), defining and describing those deviations, extracting key information to identify possible causes, testing, and verifying true causes. Next, actions should be identified to simply, effectively and inexpensively address deviations, communicate deviation and action information, and track actions to ensure implementation and improve performance. Depending upon the nature of the deviation, analyses and recommended decisions and actions can be addressed at the local level or may need to "bubble-up" to higher levels of the organization

for disposition. A key aspect of this function includes sharing lessons learned and best practices, and recognizing and rewarding outstanding performance at all levels of the INL.



There are three assurance levels in INL's approach to feedback and improvement: Governance, Leadership/Management, and Performance (see Figure 20). The Board of Managers (BOM) represents the corporate Governance assurance level. The BOM uses DOE and Battelle performance requirements to set the Laboratory's strategic direction, approve risk boundaries for laboratory operation, and perform oversight to ensure institutional risks are managed within approved boundaries.

The BOM utilizes committees to achieve its objectives. The committees are staffed with members of the Board and supplemented by outside experts, as appropriate (Figure 21).

Figure 20. Governance, leadership/management, and performance assurance levels.

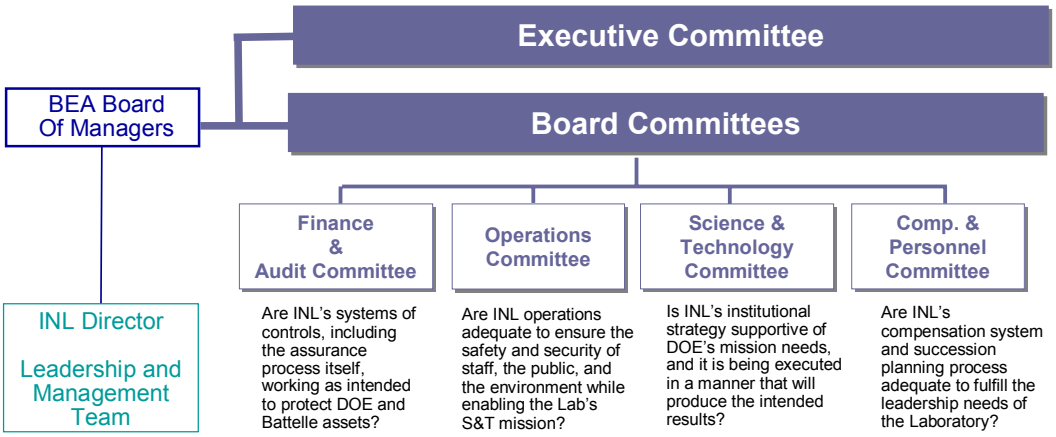


Figure 21. Board of Managers' Committees

The Leadership/Management assurance level translates strategic direction into performance objectives and plans necessary to achieve strategic outcomes, deploys resources, and maintains performance within approved risk boundaries. Within the context of assurance, leadership/management entails three management roles: Laboratory Director, LMT, and Management System Leaders(s), or until management systems are fully deployed, Functional Support Managers. Leadership/Management monitors laboratory performance

trends, implements improvements, and reports risk issues to Governance using processes documented in LWPs and through management councils.

Laboratory councils analyze and evaluate performance information they receive and then decide on actions or report risk issues, results, and recommendations to the LMT for final disposition. The councils for business (chaired by the Chief Financial Officer), operations (chaired by the Deputy Laboratory Director for Operations), and science and technology (co-chaired by the Director of Strategic Planning and the ALD for Science and Technology) provide oversight of laboratory performance and disposition recommendations from senior manager analyses and reports. The work of developing, monitoring, and acting on the information that the councils receive regularly represents the fundamental process by which the:

- LMT informs itself that its expectations and strategic and operational goals are being met
- Laboratory Director has a process that underpins the delivery of the Annual Assurance Statement to DOE as specified in the contract
- LMT is assured the policies, systems, procedures, and practices are adequate to protect DOE and INL assets
- LMT is assured management systems are working as intended with regard to managing laboratory risks.

Of the four laboratory councils, the most relevant to safety feedback and improvement is the Operations Council. The Operations Council is responsible for the following:

- Providing the INL Laboratory Director with management-level review of operational issues and activities
- Evaluating and monitoring the implementation, prioritization, and effectiveness of major initiatives, significant site-wide issues and related corrective actions, and adverse trends
- Overseeing requirements management and the status of requirements roll down
- Overseeing the ISMS, Conduct of Operations, Maintenance, and Engineering programs and related activities at the INL
- Evaluating the effectiveness of training requirements management
- Chartering subgroups as necessary to support council activities.

The Operations Council accomplishes these activities by monitoring such safety performance measures and commitments as injury/illness rates/cases, environmental releases, exposure to radiation and hazardous substances, status of PAAA events, and corrective action management (Refer to section 3.6.1).

The Performance or transactional assurance level consists of line managers and staff who conduct the daily work of the Laboratory using management and technical procedures. The Performance level uses a variety of assessment processes and tools including deployed SMEs, operational awareness, employee involvement, and self-checks and peer reviews to regularly assess performance and report results to Leadership/Management and/or Governance. Risk results and significant findings from line management assessments form the data stream inputs to the various councils and governance committees. Senior managers use these inputs to conduct regular integrated performance reviews, watch for emerging laboratory trends/issues/risks, and report the results and recommendations upward to their directors.

The next few sections will expand on the processes and tools used to implement core function five at the Performance and Leadership/Management assurance levels.

7.9.6 Employee Feedback

The mechanisms described in this section provide feedback both to and from employees and involve employees in the feedback process.

Union Safety Summit – The bargaining units participate in Union Safety Summits in which unions, INL management, and DOE-ID work together to communicate and resolve safety issues. Through this teaming, issues are brought to effective and timely resolution. These meetings are supplemented by the INL Occupational Safety and Health Council, sponsored by DOE-ID.

Follow-up Reviews – Follow-up Reviews are described in LWP-9201, "Briefings." They are a mechanism that serves to provide feedback regarding activity/task performance. Recognition of what went right is as important as what could have been done better to influence continuous improvement. Feedback from follow-up reviews is used to facilitate adjustments to activity/task performance and to promote continuous improvement in future planning and training.

Behavioral Observation and Feedback – As described in Section 7.4, the SOAR program provides workers a process for performing routine behavioral observations and identifying both safe and potentially at-risk behaviors.

Critiques - Critiques are an effective management tool to prevent recurrence of an event or to promote operational excellence. The critique process may be used for abnormal events, near misses, at the satisfactory conclusion of a new or unusual operation, or when otherwise determined necessary. LWP-9302, "Critiques," provides a consistent method of performing critiques, event reconstruction, and event evaluation. The critique process may be used to identify human performance and causal factors, and corrective actions.

Employee Safety Concerns – Employees are encouraged to submit safety concerns into the Issue Communication and Resolution Environment (ICARE) issues tracking database in accordance with LWP-13840, "Corrective Action System." Once categorized as such in ICARE, line management evaluates each safety concern to determine corrective actions and safety improvements, and then enters and assigns specific actions to accountable personnel in ICARE.

Ethics/Employee Concerns – The Employee Concerns & Ethics Office, as described in MCP-563, "Ethics/Employee Concerns Office," provides an alternate process for employees to report concerns, without fear of discrimination or reprisal, when they are dissatisfied with management response, the response does not address the concern, or the employee is not comfortable with the response. This office is not intended to circumvent the responsibility or authority of management. Employees are encouraged to first report their concerns to their immediate manager or supervisor. Employees also have the right to file a concern directly with DOE-ID.

Timeout and Stop Work Authority – LWP-14002, "Timeout and Stop Work Authority," establishes the process for taking a timeout or stopping work when a potentially unsafe condition is identified. A potentially unsafe condition is a noncompliant condition, unsafe condition, or at-risk behavior or action associated with an item or work process, which if not corrected, poses a threat to public or personnel safety, facility or process operations, quality, or the environment. A potentially unsafe condition can also exist when an employee encounters any situation, condition, or potential hazard not discussed in pre-job briefings, or if an employee has a concern about whether a job can be performed safely. A timeout (vs. stop work) is initially taken upon observation of unsafe work conditions. If the situation is readily fixable, it is corrected and work is re-commenced. If the timeout determines the condition is not readily fixable, then a stop work action is initiated and the requirements for formal stop work apply.

7.9.7 Integrated Assessment Program

The Integrated Assessment Program (IAP), described in PDD-13710, "Integrated Assessment Program," is designed to be a comprehensive, integrated, risk-based approach for managing assessments.

Senior management sponsors the assessment program. Clear roles and responsibilities for execution of the program are identified in implementing documents. Quality Assurance is responsible for the IAP development and oversight. The LMT is responsible for ensuring that assessments are effectively planned, scheduled, and performed.

Each year, an integrated plan and schedule is developed and maintained. The plan has a tiered structure with line assessments as the foundation. Assessments performed by functional areas, performance oversight, internal audit, and senior management are added to ensure comprehensive coverage.

The results of the assessment program are analyzed routinely to identify non-compliances and opportunities for improvement. Corrective or improvement actions are established and conducted based on the analysis. An overall analysis of the results of the assessment program is summarized in the ISMS Annual Report and provides feedback for areas targeted for focused improvement and assessment for the following year. The effectiveness of the IAP is measured by analyzing the performance of assessments, assessment results, and the execution of the overall process.

The following laboratory-level documents are those primarily used to implement the IAP. Other documents not listed here are also used to perform assessments.

- LWP-13730, "Developing, Integrating, and Implementing Assessment Plans and Schedules," describes the process for developing, integrating and maintaining the integrated assessment plan and schedule.
- PDD-13720, "Assessor and Lead Assessor Training and Qualification Program," describes the level of training or qualifications needed by assessment personnel performing independent assessments.
- LWP-13750, "Performing Management Reviews and Assessments," provides instructions for performing management assessments to determine the adequacy and effectiveness of an organization's management programs.
- LWP-13760, "Performing Independent Reviews and Assessments," provides instructions for performing independent assessments to verify that performance criteria have been met and to determine the adequacy and effectiveness of programs and management systems.
- LWP-13740, "Performing Inspections and Surveillances," provides the instructions for performing inspections that are usually detailed walkdowns of designated areas to determine compliance with regulatory and procedural requirements. Surveillances are typically focused on a single operation, activity, or process.
- LWP-9903, "Performing Management Self Assessments for Readiness," describes the process used for performance of management self assessments (MSAs) for readiness activities.

7.9.8 Issues Management Program

The Issues Management Program, as described in PDD-13810, "Issues Management Program," is designed to be an integrated laboratory process that enables management to understand and prioritize, based on risk and significance, the correction of various types (categories) of issues. The purpose of the Issues Management Program is to ensure that issues that have a reasonable potential to cause adverse operational, ES&H, or QA consequences are documented and resolved in an effective and timely manner.

Items, services, and processes that do not meet established requirements are controlled and corrected using a graded-approach based on the significance of

the issue and the importance of the work affected. These issues may be facility-specific, laboratory-wide or programmatic in nature and may be identified by external agencies, independent assessments, management assessments, inspections, surveillances, and employees during the conduct of work assignments. The program provides mechanisms for ensuring that adequate causal analysis, corrective action plans, verification and follow-up activities are implemented to correct and prevent recurrence of undesirable events or conditions.

The following systems comprise the major elements of the Issues Management Program:

- **Corrective Action**. LWP-13840, "Corrective Action System," is the cornerstone of the Issues Management Program. A single initiating process is used to document failures, malfunctions, deficiencies, defective items, non-conformances, and conditions or actions that have a reasonable potential to cause adverse operational or ESH&Q consequences. All employees are encouraged to identify and report a broad range of problems without fear of reprisal.
- **Cause Analysis**. A formal cause analysis process is used on a graded approach based on the issue category type and significance. For significant issues, formal cause analyses are conducted by trained and qualified employees under the provisions of LWP-13845, "Cause Analysis Program." Apparent cause analysis techniques are used for less significant issues.
- **Nonconforming Items**. LWP-13830, "Control of Nonconforming Items," contains the implementing requirements necessary to ensure that items (e.g., hardware, material, or data) that do not conform to specified requirements are identified, evaluated, dispositioned, and controlled to prevent inadvertent installation or use.
- **Lessons Learned.** The objectives of the Lessons Learned System are to use internal and external operating experience information to prevent recurrence of undesirable conditions and to promote best practices. To accomplish this objective, operating experience information, both positive and negative, is systematically evaluated and implemented to continuously improve performance. LWP-13850, "Processing Lessons Learned and Operating Experience Information," provides the instructions and responsibilities that fulfill this objective.
- **External Reporting**. Some issues require external reporting. These issues and the reporting processes include the following:
  - **Occurrence Reporting**. Occurrence reporting informs DOE and INL management, on a timely basis, of events that could adversely affect the health and safety of workers. LWP-9301, "Event Investigation and Occurrence Reporting," provides a system for reporting abnormal events to the appropriate management levels and to DOE, investigating those events,

identifying causes, and implementing appropriate corrective actions.

– **Price-Anderson Amendments Act**. The Non-compliance Tracking System was established by the DOE Office of Price-Anderson Enforcement (OE) to enable contractor reporting of significant non-compliances associated with PAAA-related nuclear safety regulations. LWP-13820, "Identification, Reporting and Resolution of Price-Anderson Noncompliances," implements the OE guidance for identifying, evaluating, reporting, and correcting non-compliances.

7.9.9 Performance Measurement, Analysis, and Reporting Program

Long-term ESH&Q objectives are established and documented in the INL Strategic Plan. Performance indicators and measures are then selected to determine achievement of the established performance objectives. Each year, goals or evaluation criteria are established for each approved performance indicator and measure. Organizational responsibility is assigned for collecting and analyzing data for each indicator and measure. Each metric is reviewed to determine performance issues. Appropriate actions to address identified issues are initiated and tracked to completion.

Each fiscal year quarter, an analysis of ESH&Q performance is conducted that includes an assessment of program implementation, identified issues, management of the issues, and performance indicators and measures. The results of the analyses are reported to the Operations Council and actions are initiated to address performance issues.

The status and effectiveness of the ISMS is evaluated annually. The evaluation focuses on functional support programs, key processes and documents, ESH&Q performance, and potential impacts on the ISMS. The annual evaluation identifies strengths, areas needing improvement, areas needing focused training, and changes needed to the ISMS description document. It also provides conclusions about the status and effectiveness of the ISMS. Performance commitments are developed to address the areas needing improvement. These commitments are combined with selected commitments contained in the PEMP. The results of the evaluation are documented in the ISMS Annual Report, which contains the safety performance commitments and the current set of safety performance objectives and measures. The report is submitted to DOE-ID for review and approval. Responsibilities for addressing the issues and commitments identified in the report are assigned. The resulting action plans are monitored and tracked to completion.

The following laboratory-level processes are those primarily used to implement the ESH&Q Performance Measurement, Analysis, and Reporting Program:

- PDD-13860, "ESH&Q Performance Measurement, Analysis, and Reporting"
- LWP-13870, "Establishing, Monitoring, and Reporting ESH&Q Performance Objectives, Goals, and Measures"

- LWP-13880, "Trending and Analyzing ESH&Q Performance"
- LWP-13890, "Performing Annual Evaluations of the Integrated Safety Management System."

7.9.10 LMT Walkdowns

The INL LMT conducts walk-downs and inspections of operations and facilities, conducts personnel interviews, observes work activities, and identifies positive and noteworthy performance and adverse conditions to promote consistent and effective behaviors via the observation process, and to reinforce appropriate performance of work practices that meet and/or exceed senior management standards and expectations. Walk-downs and inspections are also intended to promote communication and information exchanges between LMT members and laboratory personnel. Operating concepts, objectives, and philosophy for these activities include, but are not limited to, the following:

- Emphasizing the importance of continuous improvement towards achieving operational and performance excellence,
- Strengthening line management's sense of ownership and accountability,
- Increasing employee participation/interface with senior management,
- Encouraging workers to actively participate in, and take ownership for, work place safety, environmental compliance, conduct of operations and maintenance, and housekeeping,
- Providing a positive environment to communicate company standards and expectations to managers and staff,
- Increasing management oversight at the work site and establish a forum for employees to identify problems and concerns,
- Providing positive reinforcement for improvement, and
- Reporting problems to ensure timely and effective resolution.

7.9.11 FLASH

The FLASH message is used for timely notification of an event or situation to senior management and others for further dissemination to potentially affected management and personnel. A FLASH message uses the company email system with the subject line containing only the word "FLASH." This makes the email distinguishable from other email and will notify recipients that the message is of highest importance and should be read immediately. The FLASH distribution list is maintained by the Nuclear Operations organization. This rapid dissemination process allows management to perform actions such as taking immediate corrective actions, providing resources to other areas, and providing hazard mitigation as necessary to ensure work is performed in a safe manner. This message may not contain all the necessary details but will provide a "heads up" about the event or situation. While not necessary in every

situation, as further information becomes available about an event/situation, follow-up notifications should be made in as timely a manner as possible, which may include, but not be limited to, additional FLASH message(s), company email message(s), or an item disseminated through iNotes. FLASH is further described in LWP-9300, "Laboratory Excellence Guidance for Abnormal Events."

7.9.12 Joint Performance Improvement Initiative

The INL and Oak Ridge National Laboratory (ORNL) are committed to simultaneous excellence, which is an uncompromising commitment to research excellence, operational excellence, and community service. The Joint Performance Improvement Initiative (JPII)) is one vehicle used by line management at the INL and ORNL to evaluate performance objectives that promote excellence in operations. The performance objectives support achievement of the following set of operational outcomes:

- Sustainable, high levels of performance
- Sustainable, event-free operation
- Avoidance of unplanned shutdowns
- Well-managed and understood safety, design, and operational margins
- High degree of personnel safety
- A highly skilled, knowledgeable, and collaborative workforce

The JPII process involves visits by select individuals (i.e., SMEs) from one laboratory site to the other laboratory and is intended to assist management in identifying gaps in performance improvement effectiveness. The process will develop Criteria and Review Approach Documents (CRADs), based on the general scope and specific requests from line management, to use in the JPII assist visits. IAG-392, "MOU for Technical Cooperation Between BEA, LLC and UT-Battelle, LLC for the Joint Performance Improvement Initiative," describes the membership, process, and roles and responsibilities of the JPII.

8. MAINTAINING AN APPROVED ISMS

48 CFR 970.5223-1 requires DOE and contractor actions to continuously maintain the integrity of ISMS and to generate revisions as scheduled by the contracting officer. Chapter IV of DOE G 450.4-1B provides guidance for maintaining the integrity of an approved ISMS. BEA and DOE-ID are responsible for ensuring that the approved ISMS description, PDD-1004, is controlled by an effective feedback and improvement process so that it remains current.

The intent of maintaining ISMS current is to ensure work continues to be conducted efficiently and in a manner that protects the health and safety of the worker, the public and the environment. To meet this intent, compliance with current requirements (directives, laws, regulations, etc.), and maintenance of the safety authorization basis and worker protection programs must remain current and effective. The mechanisms described in this section are used to ensure these aspects of the system receive appropriate review and analysis through effective feedback and assessment

processes to ensure system maintenance, thus providing the opportunity for continuous improvement.

The clause, DEAR 970.5223-1 "Integration of Environment, Safety and Health into Work Planning and Execution," requires the contractor to measure ISMS effectiveness and annually identify and allocate resources to maintain the integrity of the system. Overall responsibility for maintaining the ISMS resides with the Director, ESH&Q. BEA applies key processes inherent to the ISMS Infrastructure to maintain and improve the effectiveness of ISMS throughout the year. This approach is depicted in Figure 22, "Maintenance of the ISMS Infrastructure." Requirements management, CCR, and authorization bases upgrades are ongoing processes that maintain the ISMS and are carried out continuously throughout the year. The lessons learned process offers a mechanism to provide feedback for improving the system. Trending and reporting safety performance objectives, performance measures and commitments are the tools for measuring system effectiveness.

Using assessment results and other data from the processes identified above, an annual evaluation is conducted to determine the status of implementation, integration and effectiveness of the ISMS. This process is described in LWP-13890, "Performing Annual Evaluations of the Integrated Safety Management System." Included in the annual evaluation activities are evaluations of: the laboratory level functional support areas described in Section 5 of this PDD; key ISMS processes and associated implementing documents; ESH&Q performance; and potential system impacts.

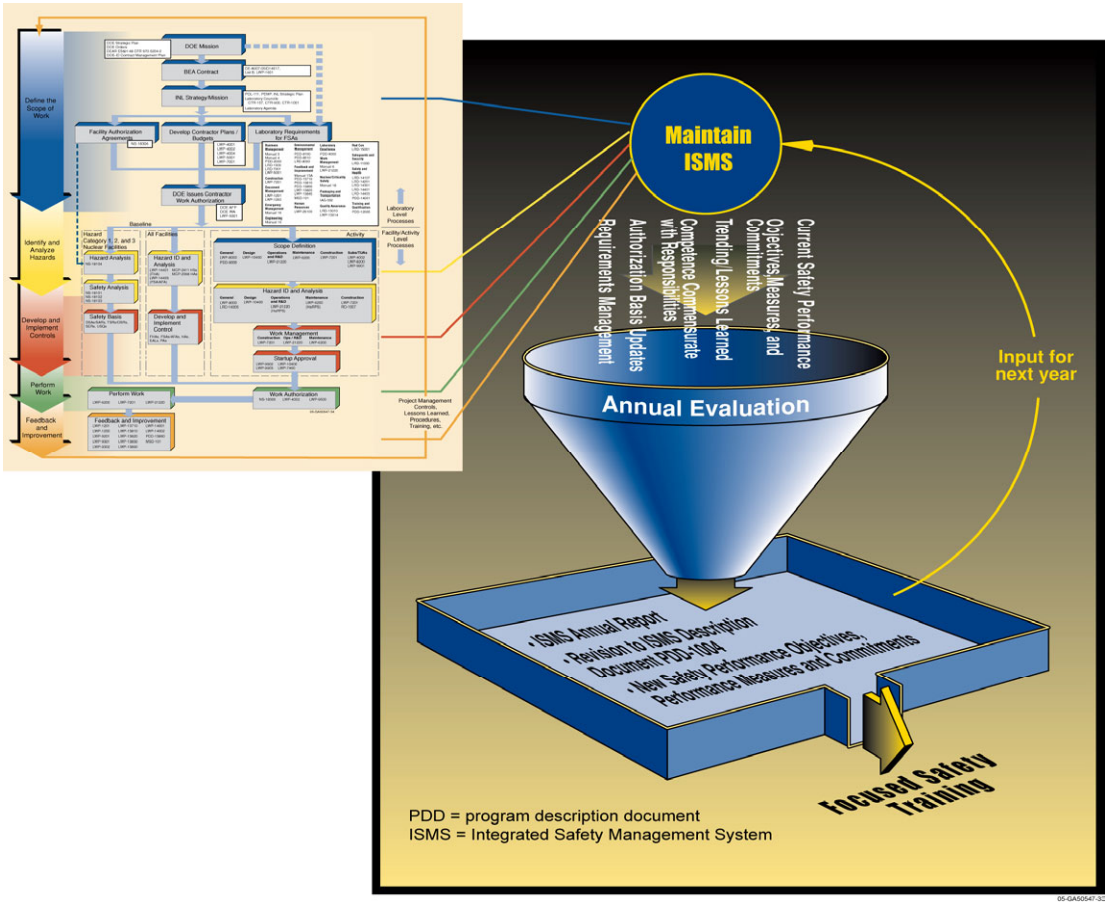


Figure 22. Maintenance of the ISMS infrastructure.

The results of the evaluation process are documented and used to improve the overall ISMS. As the final product of the annual maintenance process, the Evaluation Report summarizes the results of the evaluation including:

- actions taken to evaluate the system effectiveness
- status of functional support programs
- status of key ISMS process and associated implementing documents (e.g., infrastructure maintenance, assignment of roles and responsibilities; and personnel selection, training and qualification, facilities' safety basis maintenance)
- ESH&Q performance since the last evaluation
- progress in achieving safety performance objectives
- success in completing safety performance commitments
- resolution of issues from the previous ISMS evaluations
- assessment findings
- any events that may have occurred
- status of regulatory compliance
- any employee safety concerns
- impacts from any significant changes in organization, budget, processes, activities, etc., that have occurred since the last annual evaluation.

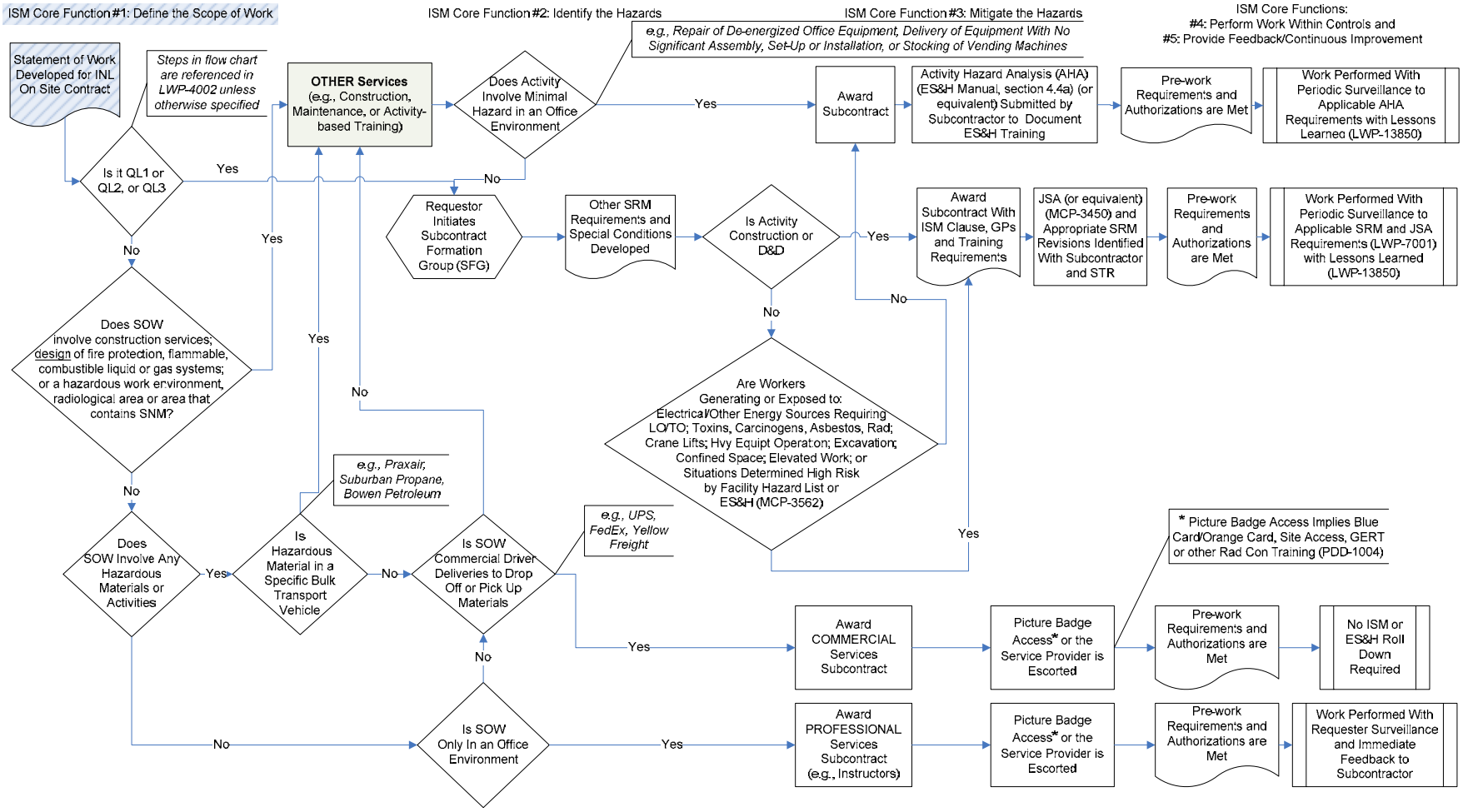
The SMRB reviews the results of the annual evaluation and assigns responsibilities for taking actions to address all of the identified issues, areas needing improvement, focus training needs and performance commitments. The assigned actions are tracked to resolution, with Performance Assurance monitoring and providing status reports. BEA will continually maintain the integrity of ISMS by compiling and assessing sufficient measures of program activities in order to make informed decisions on safety resources for these activities. Information and performance data on ISMS (e.g., performance measures, JPII reports, assessment results, worker suggestions and other relevant feedback) are essential factors in the ISMS feedback, improvement and change control processes. The following mechanisms, which have already been described, are the processes by which BEA will sustain, measure, and update the ISM system:

- Requirements Management Process – LWP-1601 provides both the mechanism by which changes to laws, regulations and directives are reviewed and the process to sustain and update the set of standards, practices and controls that make up the ISMS.
- Authorization Basis Update Process – The implementation of updated safety basis documents can lead to program and procedure revisions. Implementation and validation processes ensure the flowdown of any revised requirements.
- Competence Commensurate with Responsibility – Personnel CCR is maintained by their involvement in site training programs. Training can originate from a variety of processes, such as a response to corrective actions or maintaining a specific qualification.
- Assessment and Performance Measurement Programs – An overall analysis of the results of the assessment program is summarized in the ISMS Annual Evaluation Report and provides feedback for areas targeted for focused improvement and assessment for the following year.

- SPOMC – BEA develops SPOMC (LWP-13890) that are submitted for DOE approval. The ISMS Annual Evaluation Report provides input for the next year's SPOMC. The annual submittal affirms commitments made for the previous year and provides commitments for the following year. Progress on achievement of the SPOMC is reported quarterly in the ESH&Q Performance Report and Analysis and status of achievement is included in the ISMS Annual Evaluation Report.

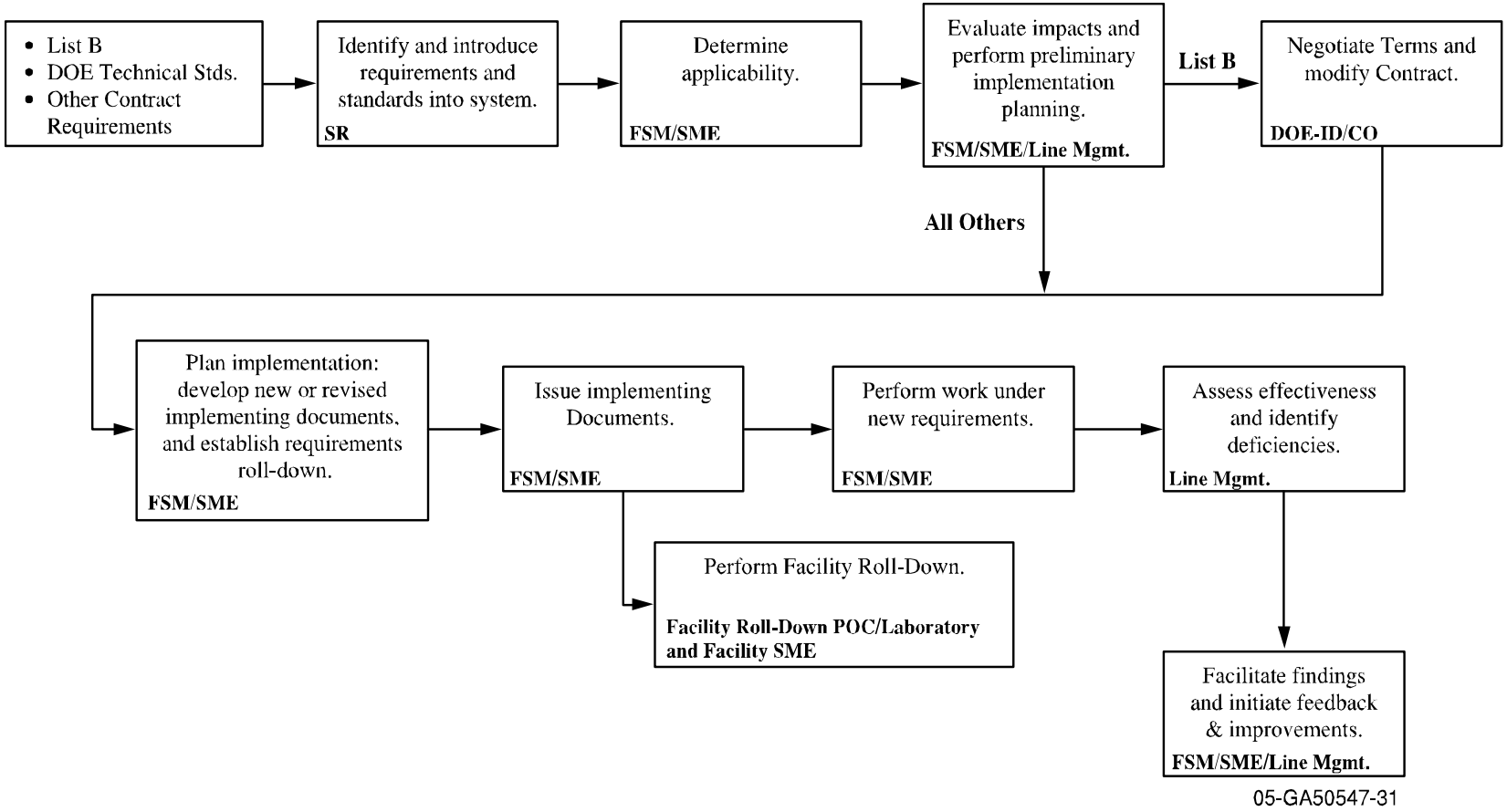
Appendix A

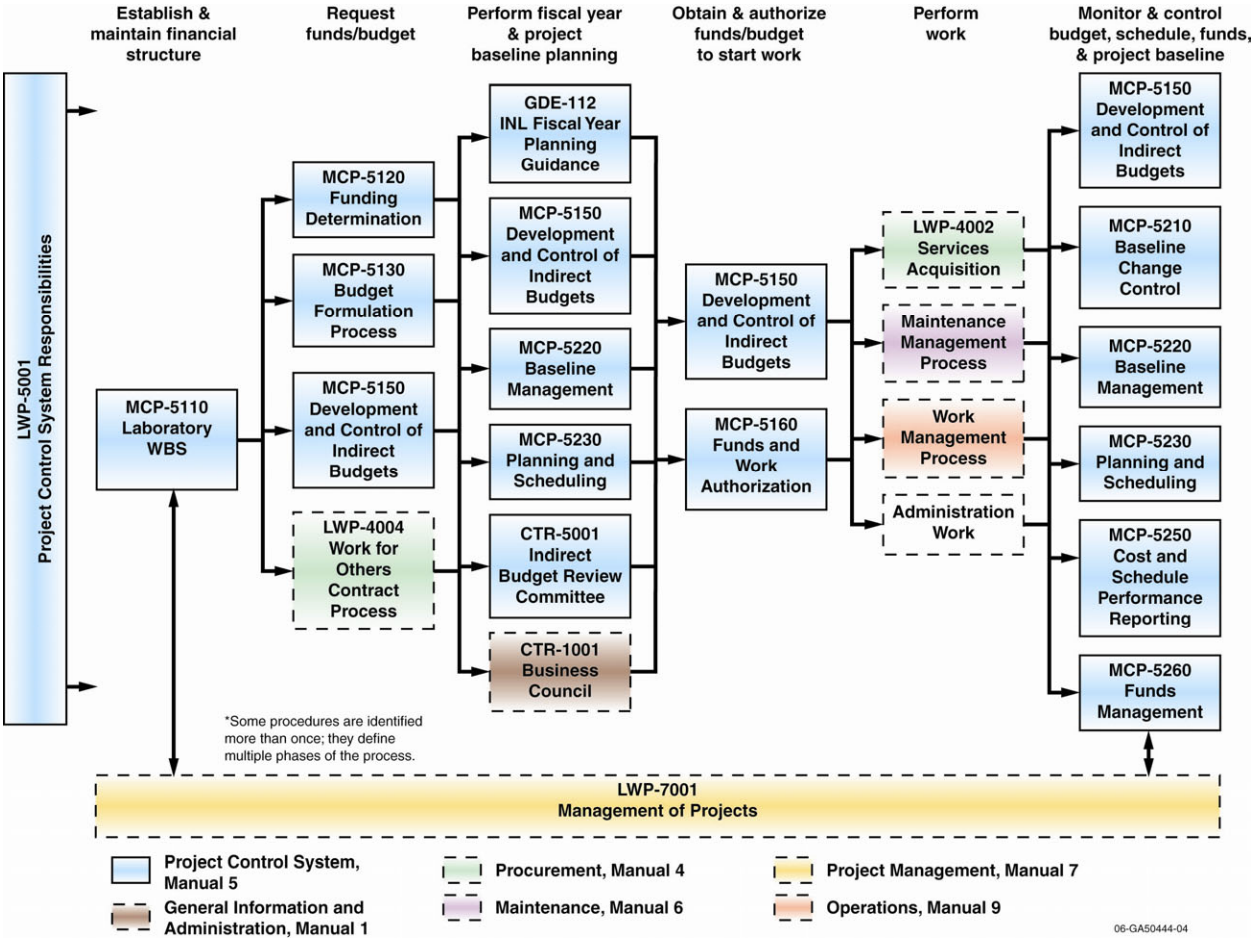
Subcontractor and Vendor Requirements Flow-down Process



Appendix B

Laboratory Requirements Management Flow-down Process



Appendix C

Business, Budgets, and Contracts Procedure Flow