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**Argonne National Laboratory  
Worker Safety and Health  
Program/Integrated Safety  
Management System Description**

February 20, 2008  
Updated June 13, 2008

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**Division Specific Document**  
(with Office Activities)

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Materials Science Division

George Croft      6-13-08

Approved

Date



## Worker Safety and Health Program/Integrated Safety Management System Description

### ACRONYMS

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### ACRONYMS

ACGIH	American Conference of Governmental Industrial Hygienists
AHJ	authority having jurisdiction
ALD	associate Laboratory director
APS	Advanced Photon Source
ASO	DOE Argonne Site Office
CAS	Contractor Assurance System
CFR	Code of Federal Regulations
CRADA	cooperative research and development agreement
DSC	Director's Safety Council
DOE	U.S. Department of Energy
DOT	U.S. Department of Transportation
EMS	Environmental Management System
EPA	U.S. Environmental Protection Agency
ESH, ES&H	environment, safety and health
ESH&I	environment, safety, health, and infrastructure
EQO	Environment, Safety, Health, and Quality and Performance Assurance
FWP	field work proposal
HAZWOPER	Hazardous Waste Operations and Emergency Response Standard
IA	independent assessment
IBC	Institutional Biosafety Committee
ISM	Integrated Safety Management
ISMS	Integrated Safety Management System
JHQ	Job Hazard Questionnaire
JSA	job specific safety analysis
KSA	knowledge, skills, and abilities
LLC	limited liability company
LO	DOE line oversight

**Worker Safety and Health Program/Integrated Safety Management System Description****ACRONYMS**

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MA	management assessment
MAPPS	Management and Proposal Planning System
MSD	Materials Science Division
NEPA	National Environmental Policy Act
NIH	National Institutes of Health
OCC	Oversight Coordinating Committee
OPS	Argonne Operations Directorate
OSHA	Occupational Safety and Health Administration
QA	Quality Assurance
QAPM	Quality Assurance Procedures Manual
QARD	Quality Assurance Requirements and Description
SA	self assessment
SME	subject matter expert
TMS	Training Management System
WSHP	Worker Safety and Health Program

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 1 EXECUTIVE SUMMARY**

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**1 EXECUTIVE SUMMARY**

Title 10 of the Code of Federal Regulations (CFR), Part 851, referred to as 10 CFR 851, Worker Safety and Health Program, requires the development of a Worker Safety and Health Program (WSHP) for every covered Department of Energy (DOE) site. The purpose of the program is the prevention of injuries and illnesses to workers at the covered sites. This rule is substantively similar to the DOE Order 440.1A that most sites had been working under as a DOE directive that was incorporated into the operating contract for the site. The contract for UChicago Argonne, LLC, to operate Argonne National Laboratory includes the requirement for an Integrated Safety Management System (ISMS). DOE's ISMS requirements are described in 48 CFR 970.5223-1, *Integration of ES&H into Work Planning and Execution*. In turn, these requirements are promulgated across the DOE by DOE P 450.4, *Safety Management System Policy*.

This WSHP/ISMSD describes the policies and procedures that together comprise the functional WSHP at Argonne National Laboratory in compliance with 10 CFR 851 and the DOE P 450.4. The overall WSHP/ISMSD is implemented by the policies and procedures of the Argonne tier 1 and tier 2 documents. In this document, these tier 1 and tier 2 implementing policies and procedures collectively are referred to as the ESH&QA policy.

The Rule applies to operations at the Argonne site located at 9700 S. Cass Ave., Lemont, IL 60439.

This WSHP/ISMSD is structured so the reader can navigate to the implementing Argonne policies and procedures that are the ESH&QA program. While many policies and programs are described in brief within the text of this document, they are linked to the full, official program on the applicable Argonne Policy and Procedures web space. These linked policies and procedures are those that interface with the work planners, supervisors at all levels, and the front line employee guiding the development, evaluation, planning, and execution of work activities.

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 2 ARGONNE MISSION**

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**2 ARGONNE MISSION**

The mission of UChicago Argonne, LLC, (Argonne National Laboratory) is to serve the U.S. Department of Energy (DOE) and national security by advancing the frontiers of knowledge, creating and operating forefront scientific user facilities, and providing innovative and effective approaches and solutions to energy, environmental, and security challenges to national and global well-being, in the near and long term, as a contributing member of the DOE laboratory system.

To fulfill this mission, Argonne recognizes the need for care of the environment, the safety and health of its employees, and continuing quality assurance in all endeavors in order to have best-in-class science and strive to lead research as a model institution. This document provides a description of the principles of integrated safety management (ISM) as well as how those principles and their associated quality assurance (QA) requirements are integrated into the daily processes at the Laboratory. To effectively describe the integration of the basic ESH&QA values, this WSHP/ISMSD contains and references the documents that make up and support the WSHP/ISM and QA policies, procedures, and initiatives of the Laboratory.

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 3 MANAGEMENT COMMITMENT**

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**3 MANAGEMENT COMMITMENT**

During his February 28, 2006, State of the Laboratory address, Laboratory director Robert Rosner said:

"So if you ask, do I mean that we will fix the safety issues at the lab and that we are going to become best-in-class in safety, the answer is absolutely yes. That is the reason we have invested in reconstituting our safety team, rebuilding our safety assessment and assurance programs, and turning up our efforts to communicate the fundamental message: safety first in all possible ways."

This clear statement from the Laboratory director illustrates his commitment to the integration of safety into every process, and establishes that safety comes first "...in all possible ways."

The Argonne ESH&QA program is implemented through management commitment. Specifically, the Integrated Safety Management System (ISMS) at Argonne is designed to satisfy the objectives of integrated safety management that are prescribed in 48 CFR 970.5223--1, *Integration of ES&H into Work Planning and Execution*, and implemented across the Department of Energy by DOE P 450.4, *Safety Management System Policy*, as well as by the Environmental Management System (EMS) prescribed in DOE O 450.1, *Environmental Protection Program*. Argonne policies, programs and procedures are designed to systematically integrate ESH&QA and ISMS into the management and work practices at all levels so that our mission is accomplished while protecting the public, the workers, and the environment.

At Argonne, this commitment is embodied by the Director's Safety Council (DSC). This council meets biweekly to review the structure and performance of Environment, Safety, Security and Health (ESSH)-related efforts at Argonne, thereby ensuring senior line management involvement in these areas, discuss the current safety issues facing the Laboratory, review the previous two weeks' injury and illness cases or events, and interact with and direct the chair from each of the Laboratory-wide safety committees at the Argonne site. Laboratory-wide safety committees report back to the DSC on their progress, experiences, and improvements through a scheduled presentation. The membership and charter of the [Director's Safety Council](#) can be found in the *Laboratory Committees Manual*.

While Argonne is committed to safety in the performance of work for every employee, we recognize safety is predicated on personal accountability. It is Argonne's policy that all employees be accountable for their activities, including safety in the work place. Argonne's commitment to safety in the work place is demonstrated by the revision of the performance appraisal system that elevates the level of importance placed on safety in the daily performance of work and holds each employee accountable for their actions. Specifically:

1. To support the core Argonne value of safety first, the safety responsibility appears first on the employee's performance appraisal form, ahead of the position description responsibilities.

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### Chapter 3 MANAGEMENT COMMITMENT

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This positioning reinforces that all work must be done safely before any other consideration or duty. If an employee demonstrates poor safety performance, or if they demonstrate exceptional safety performance, they are rated accordingly.

2. Poor performance with regard to environment, safety and health requirements application and adherence carries strong negative consequences, which include a rating of “needs improvement” (N). Management must then develop a performance improvement plan specifically for safety, and monitor that employee's progress. The rating of "needs improvement" is mandated for some specific safety infractions (e.g., an employee sent home for a safety-related infraction; not reporting a safety incident). An employee who receives a "Needs Improvement" in safety loses their eligibility for an overall "Distinguished" rating. The employee's supervisory chain is also reviewed by the Director's Safety Council. If the unsafe act(s) can be traced to a lack of supervisory oversight, the Director's Safety Council may also indicate that the supervisor(s), up to and including the Laboratory director, receive a "Needs Improvement" on safety performance and is likewise ineligible for a performance bonus and a "Distinguished" rating.

The commitment to accountability reaches all employee levels at Argonne. Additional information can be found in the [Guide to Performance Appraisals](#).

#### **Division Specific Information – Management Commitment**

Supervisors are responsible for informing their employee of the importance of safety and how safety has been integrated into their work activities. Specifically, supervisors are responsible for defining the scope of work for the workers under their direct supervision and monitoring their activities.

### **3.1 REQUIREMENTS DEVELOPMENT PROCESS**

Argonne strives to involve all levels of management in the development of institutional programs by ensuring that any substantive change to an ESH&QA policy is vetted first through the associate Laboratory directors' ESH&QA representatives, who then distribute it to the ESH&QA coordinators in their line organizations. This process achieves appropriate diversity in representation from the functional areas of the Laboratory and gives subject matter experts of various disciplines and with varying technical skills the opportunity for input on the proposed ESH&QA programs before they are adopted. Line management can then gauge the impact of the proposals and obtain universal buy-in for the ESH&QA programs, resulting in improved and more prompt compliance based on a better understanding of the new requirements.

#### **Division Specific Information – Requirements Development Process**

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 3 MANAGEMENT COMMITMENT**

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As requested, the Division reviews and comments on new and revised Argonne ESH&QA policies and procedures. In most cases, the ALD ESH/QA representative coordinates the review by distributing the documents, providing additional information and answering questions.

**3.2 ARGONNE'S TIERED DOCUMENTS**

The standards and requirements that define Argonne control measures (hazards present in Argonne work areas must be evaluated and appropriate controls implemented before work is performed) extend from the DOE contract with UChicago Argonne, LLC, through activity and project-level documentation described in [Argonne Policy Manual Chapter 2 – Policy System](#) and illustrated in Table 3-1.

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**TABLE 3-1. Argonne's Tiered Documents**

#### **DOE-UChicago Argonne, LLC, Contract**

DOE orders  
 Federal regulations  
 Other administrative and management language  
 Performance measures

#### **Argonne Tier 1**

[Argonne Policy Manual](#)

#### **Argonne Tier 2**

##### **Requirements documents**

[Configuration Management Program](#)  
[Environment, Safety and Health Manual](#)  
[Hazardous Materials Transportation Safety Manual](#)  
[Hoisting and Rigging Manual](#)  
[Human Resources Policy and Procedure Manual](#)  
[Laboratory Committees Manual](#)  
[Nuclear Safety Procedures Manual](#)  
[Procurement Operations Manual](#)  
[Project Management Manual](#)  
[Quality Assurance Procedures Manual](#)  
[Storm Water Pollution Prevention Plan](#)  
[Waste Handling Procedures Manual](#)

##### **Program description documents**

Comprehensive Emergency Management Plan  
[Contractor Assurance System Description](#)  
[Environmental Management System Description](#)  
[Quality Assurance Requirements and Description](#)

#### **Argonne Tier 3**

Division Chemical Hygiene Plan  
 Division-level policies and procedures  
 Division Safety Committee Charter (including: structure and responsibility of safety committees; description of organizational structure and personnel; roles/responsibilities/authorities)  
 Division Quality Assurance Plans  
 Experiment safety review  
 Facility inspection process  
 Inventories of materials/equipment/facilities per Argonne requirements  
 Local Area Emergency Plan  
 Manual of Construction  
 Performance evaluations  
[Roles and responsibilities for ESH/QA assignments in position descriptions](#)  
**Project Level Documentation** (*often in accordance with division-level process*)

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Design specifications, [baselines](#), plans, drawings, and approvals  
Experiment safety plan, including environmental evaluation (NEPA)  
Job Safety Analysis; [Construction](#), [High](#), [Moderate](#) and [Low](#)  
Operating procedures (as needed to adequately assure safety and quality)  
Quality assurance plans (as needed to supplement division plans), and Work plans  
(e.g., FWP, statement of work, proposal, CRADA)

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**Division Specific Information – Document Management Process**

The division implements the Argonne policies and procedures applicable to office work activities. As such, the division does not have any specific ESH/QA policies or procedures for office activities.

Experimental laboratory work in the division is covered under the project safety review process, which is guided by the Argonne ESH Manual, section 21.2. Additional policies for the safe handling of chemicals are found in the divisional Chemical Hygiene Plan.

**List of Division Specific Documents**

Chemical Hygiene Plan  
Project Safety Review

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 4 POLICY AND PROGRAM FOR ESH AND QA, WSHP, AND ISM**

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**4 POLICY AND PROGRAM FOR ESH AND QA, WSHP, AND ISM**

The ESH and QA policies at Argonne apply to all employees, users, research visitors, students, subcontractors at every level, as well as suppliers. The [Environment Safety and Health Policy](#) begins with the *Laboratory Policy Manual*, which also contains the [Environmental Protection Policy](#) and the [Quality Assurance Policy](#).

The *Argonne Policy Manual* contains the corporate wide requirements and commitments for how work is performed at Argonne. Within the *Argonne Policy Manual*, Chapter 7 is directly related to environment, safety and health requirements and implementation for all work performed at the Argonne site. Specifically:

- Section 7.1, “Environment, Safety and Health Policy,” contains the corporate policy for compliance with the ESH requirements contained in the tier 2 documents. This policy also establishes the communication between and interrelationship of the ESH and the QA requirements for all work performed at Argonne.
- Sections 7.2 through 7.7 contain the safety policy for specific activities including biosafety, emergency management, environmental protection, radiation safety, and contractor (construction) safety.
- Section 12, “Quality Assurance Policy,” contains the corporate policy for compliance with the applicable QA requirements and details the interrelationship of the QA and ISM programs in successfully completing work at Argonne. Specifically, subsection 12.2, “Scope,” states: “The QA program and the Integrated Safety Management (ISM) program are integrated and mutually consistent because environment, safety and health (ES&H) considerations are desirable and necessary qualities in all Argonne products and services, and the ISM system discussed in the ES&H Policy (Ch. 7) ensures that ES&H considerations are included in work processes.”

Everyone at Argonne must fully comply with the procedures, instructions, and directives contained in the *Argonne ESH Manual*, *Argonne Environmental Management System Description (EMS)*, *Argonne Quality Assurance Requirements and Description (QARD)*, and *Argonne Quality Assurance Procedures Manual (QAPM)* in order to perform safe, environmentally compliant work that protects the health and safety of the worker and the public while meeting quality requirements and preserving the integrity of DOE assets. Chapter 7 of the *Policy Manual* establishes ESH&QA expectations. The requirement to follow established ESH&QA policies in all facets of work is documented in [Human Resources Policy 1300](#).

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Argonne's ESH&QA program is described in and implemented through several manuals. The major documents that prescribe ESH&QA requirements include the:

- [ESH Manual](#)
- [Environmental Management System \(EMS\) Description](#)
- [Project Management Manual](#)
- [Procurement Operations Manual](#)
- [Quality Assurance Requirements and Description \(OARD\)](#)
- [Quality Assurance Procedures Manual \(QAPM\)](#)

Several other Argonne documents and/or manuals contain and/or prescribe ESH&QA-specific supporting policies and procedures. These additional documents may be viewed on the [Argonne Policies and Procedures](#) web site.

Argonne's goal of consistently planning and performing work in a manner that protects the health and safety of the worker, the environment, the public, and the Laboratory is achieved through application of the Seven Guiding Principles and Five Core Functions of the DOE's Integrated Safety Management System (ISMS). The requirements pertaining to the DOE's ISMS program are prescribed in 48 CFR 970.5223-1, *Integration of ES&H into Work Planning and Execution*. In turn, these requirements are promulgated across the DOE by DOE P 450.4, *Safety Management System Policy*. These upper-tier requirements are promulgated at Argonne via a series of implementing documents.

**Division Specific Information – Description of Work Planning and Control Process**

Work activities are addressed in each employee's Position Description.

The work activities of principal investigators including group leaders are primarily self-directed. Junior scientific staff including postdoctoral appointees and graduate students are expected to develop the facility to do self-directed scientific work, but they receive guidance from their superiors. The safety of all experimental scientific work is reviewed via the project safety review process. Numerous sections of the ES&H Manual are applicable to the experimental scientific work, while the project safety review process is guided by section 21.2.

Typically, office work activities do not require a work planning and control process to address hazards of the work. As such, the focus is to provide a safe office environment

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### **Chapter 4 POLICY AND PROGRAM FOR ESH AND QA, WSHP, AND ISM**

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that encourages environmental responsibility. ES&H Manual Section 7.10, Office Safety, is designed and implemented to maintain safety in office areas. Environmental considerations include reducing paper use by double sided copying, and recycling batteries, paper, plastics and aluminum cans.

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**5 INTEGRATED SAFETY MANAGEMENT SYSTEM**

The DOE's and Argonne's Integrated Safety Management System is a formal approach to integrating safety into all aspects of the work process. In the past, many facilities employed an "expert-based" approach to safety. Typically, when initially developed and implemented, expert-based approaches to safety are based on standards. However, over time they are not kept current because the institutional knowledge base resides only with employees. Gradually over the years, expert-based approaches run the risk of degrading to a "this is the way we've always done it," philosophy.

DOE's ISMS program prescribed in DOE P 450.4 mandates a "standards-based" approach to safety. Typically, standards-based approaches to program implementation are requirements-founded, requirements-driven, and are much more formal in nature. The intent of the ISMS program is to integrate all existing safety requirements into one coordinated program. This approach:

- Ensures consistency in the various work processes (e.g., work planning, work control, work execution);
- Provides all the requirements for designing, developing, implementing, and assessing facility safety programs within one process, rather than separate processes; and
- Establishes bases for objective independent program assessment against known standards.

ISMS is implemented by and functions through Seven Guiding Principles and Five Core Functions. Argonne endorses ISMS to be implemented across the Laboratory. Argonne recognizes and understands the vast differences in mission, function, and infrastructure that exist across the Laboratory and therefore expects each directorate and its supporting divisions and departments to apply the principles of a documented, graded approach to their respective implementation of the ISMS program. The following discussion of the Seven Guiding Principles and Five Core Functions is a summary of the detailed requirements and expectations of line management contained in the:

- [Configuration Management Manual](#)
- [ESH Manual](#)
- [Hazardous Materials Transportation Safety Manual](#)
- [Nuclear Safety Procedures Manual](#)

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- [Project Management Manual](#)
- [Quality Assurance Procedures Manual](#)
- [Waste Handling Procedures Manual](#)

**Guiding Principle 1, Line Management is Responsible for Safety**, establishes management ownership of safety at Argonne. It is expected that individual line organizations formally establish internal expectations for safety for their personnel, including specific technical resources (e.g., subject matter experts, safety committees, etc.), management safety oversight, and assessment programs. Table 5-1 illustrates approval and authorization and gives examples within each.

**Guiding Principle 2, Clear Roles and Responsibilities**, requires the identification and documentation of unambiguous lines of approval authority through position-specific roles and responsibilities (e.g., managers, supervisors, workers).

**Guiding Principle 3, Competence Commensurate with Responsibilities**, requires that competencies for each position are identified and documented based on position-specific risk and level of responsibility. This ensures that workers possess the training, knowledge, skills, and abilities to perform their work safely.

**Guiding Principle 4, Balanced Priorities**, provides for a proper balance between mission and safety. Management sets priorities and ensures that ESH&QA requirements are addressed before work is authorized.

**Guiding Principle 5, Identification of Safety Standards and Requirements**, is the vehicle through which a line organization establishes its specific standards and requirements relative to safety when the criteria are not previously established by contract or regulation.

**Guiding Principle 6, Hazard Controls Tailored to the Work Being Performed**, ensures that hazards specific to the task are identified, analyzed, and mitigated before work is authorized. Hazard controls are communicated to the worker before work is performed.

**Guiding Principle 7, Operations Authorization**, is the principle that ensures that facility and worker readiness is appropriately confirmed before work is authorized and executed. The Seven Guiding Principles provide a framework within which management ensures that work can be performed in a safe and consistent manner while achieving predictable results. Further ISMS implementation occurs at the worker level via the Five Core Functions.

## Worker Safety and Health Program/Integrated Safety Management System Description

### Chapter 5 INTEGRATED SAFETY MANAGEMENT SYSTEM

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**TABLE 5-1 Approvals and Authorizations**

Principle	Definition and Implementation
1. Line Management Responsibility for Safety	Line management approves the following: <ul style="list-style-type: none"> <li>– Safety processes, including <ul style="list-style-type: none"> <li>– Process for experiment safety review</li> <li>– Process for safety committees</li> <li>– Process for inspections</li> </ul> </li> </ul>
2. Clear Roles and Responsibilities	<ul style="list-style-type: none"> <li>– Division-specific authorities and responsibilities</li> <li>– Division-specific policies and procedures</li> <li>– Quality Assurance Plan</li> <li>– Chemical Hygiene Plan (where applicable)</li> <li>– Local Area Emergency Plan</li> <li>– Radiation Protection Program</li> </ul>
4. Balanced Priorities	The following involve approval or authorization: <ul style="list-style-type: none"> <li>– Experiment and/or safety reviews for projects, activities, equipment</li> <li>– Environmental evaluations, including NEPA</li> <li>– Health and safety plan for field work</li> <li>– Research involving human subjects</li> </ul>
5. Identification of Safety Standards and Requirements	<ul style="list-style-type: none"> <li>– Interlock systems for radiation protection</li> <li>– ALARA goal (and goal deviation)</li> <li>– Variances to the ESH Manual</li> <li>– Procedures/facilities for biohazards</li> <li>– Use of detonable mixtures of gases</li> </ul>
6. Hazard Controls Tailored to the Work Being Performed	<ul style="list-style-type: none"> <li>– Standard operating procedure for lasers</li> <li>– Standard operating procedures for carcinogens</li> <li>– Use of specific equipment items</li> <li>– Hydrogen; several specific approvals</li> <li>– Use of alkali metals</li> <li>– Working alone</li> <li>– Off-hours building access</li> <li>– Lockout/tagout procedures</li> </ul>
3. Competence Commensurate with Responsibility	<ul style="list-style-type: none"> <li>– Supervisors approve Job Hazard Questionnaire</li> <li>– Authorization to do electrical work</li> <li>– Authorization to work by completing: <ul style="list-style-type: none"> <li>– Radiological protection training</li> <li>– Waste generator training and certification</li> <li>– Completion of HAZWOPER training</li> <li>– Laser safety training</li> <li>– Lockout/tagout training</li> <li>– Respirator training and medical certification</li> <li>– Hoisting and rigging training and certification (including equipment-specific)</li> </ul> </li> </ul>
7. Operations Authorization	The following require approval by qualified personnel: <ul style="list-style-type: none"> <li>– Designs for specialized, high-cost, complex, high-risk equipment</li> <li>– Requisitions for certain materials (e.g., chemicals; radioactive materials)</li> <li>– Requisitions for certain equipment (e.g., laser, hoisting and rigging,</li> </ul>

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Principle	Definition and Implementation
	<ul style="list-style-type: none"> <li>x-ray source)</li> <li>– Service requests</li> <li>– Shipping requests</li> <li>– Designs for facility construction/modification</li> <li>– Work by non-Argonne contractors and service providers</li> <li>– Safety plans</li> <li>– Job safety plan</li> <li>– Tool inspection</li> <li>– Work entry clearance permit</li> <li>– Radiation work permit</li> <li>– Occupancy permit</li> <li>– Hot work permit</li> <li>– Open flame permit</li> <li>– Digging permit</li> <li>– Confined space entry permit</li> <li>– Experiment Safety Review Approval</li> <li>– Project Authorization</li> </ul>

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Processes to ensure implementation of the following five Core Functions of ISM into each work activity are: the [Project Management Manual](#); [ESH Manual Section 21.1, "Hazard Analysis Processes for Nonexperimental Work"](#); and [ESH Manual Section 21.2, "Experiment Safety Review."](#)

**Core Function 1, Define the Scope of the Work:**

- Defines the boundaries of the job/task,
- Identifies necessary resource requirements,
- Analyzes impact on operations/facility conditions,
- Assesses/determines the necessary quality level for the task, and
- Identifies and establishes controls.

**Core Function 2, Analyze the Hazards of the Work**, requires an assessment of the work to be performed relative to all known and/or possible hazards, e.g., stored energy, radiation/ contamination, hazardous substances, thermal extremes. In addition, the analysis must also consider all of the hazards inherent in the work area and challenge previous assumptions.

**Core Function 3, Mitigate Hazards and Develop Controls**, requires that a combination of administrative controls (e.g., procedures, training) and engineered controls (e.g., barriers, shielding) be developed and implemented for the task to be performed.

**Core Function 4, Perform the Work within the Hazard Controls**, requires that all work be performed within controls established in Core Function 3. Working within established controls embodies the following principles:

- Always remember that line management and you are responsible for your safety.
- Stop work if something does not seem right and inform your supervisor.
- If expected results are not obtained, stop and inform your supervisor.
- Line management is responsible for assessing performance to ensure that work is performed within controls.

**Core Function 5, Provide Feedback and Continuous Improvement**, requires documentation of what worked well and what did not for any given task. Problems are

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corrected in a timely manner as necessary. Lessons are learned such that the same mistake is not made again.

**Change controls must be completed when a project's scope of work changes.** Scope changes trigger a graded set of change control requirements and reevaluation of the hazards and controls in place to protect the worker, the environment, and the property involved. An example of construction change control can be found in the Argonne [Project Management Manual, Appendix J](#), Section 2.0.

Changes to the original scope of a project or outside the original scope of a tier 2 or tier 3 work procedure must be made according to the change control process described in *ESH Manual Chapter 21.1, "Hazard Analysis for Nonexperimental Work."* Divisions also require update and resubmittal of documentation (e.g., experiment safety review) when the scope of smaller projects is changed. An example is the procedure for change in an experiment run at Atlas: [http://www.phy.anl.gov/atlas/safety/saf\\_experiment.html](http://www.phy.anl.gov/atlas/safety/saf_experiment.html).

Change control is the opportunity for an individual worker to have input into the overall system and specific controls used. It is also an opportunity for line management to begin the upward flow of information, implementation of employee suggestions, and action on concerns expressed by the front line worker.

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 6 ARGONNE'S WSHP / ISMS APPROACH**

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**6 ARGONNE'S WSHP / ISMS APPROACH**

Argonne's approach to compliance with 10 CFR 851 WSHP and DOE P 450.4 ISMS is to establish a single set of requirements in Argonne policies, procedures, and processes that incorporates DOE, contract, and Argonne ESH&QA requirements, rules, and expectations. A single set of requirement documents will minimize redundancies and will enhance implementation with a single, consistent framework of activities management.

**6.1 ISMS GOALS**

The goals of UChicago Argonne, LLC, are zero injuries, zero unsafe acts, and zero incidents so that Argonne can efficiently achieve its mission. Attainment of these goals will exceed customer expectations, including those of the Office of Science. Argonne's goal for ISMS is to show a continued reduction in the total number of incidents by continuously reducing the number of unsafe acts and unsafe conditions through the use of established behavior-based safety initiatives and human performance indicators. Achieving a compliant, forward-thinking ESH&QA program that is influenced by leading indicators for the prevention of incidents rather than lagging indicators is an Argonne long-term goal. To accomplish this goal, and as a result of Argonne's completion of an independent assessment of work control across all divisions, the Laboratory is reexamining its approach to work control processes and has initiated the development of a single work control process that incorporates the best practices of external organizations and the best practices already in use at Argonne. A single integrated work control process will ensure that the scope of work is defined, hazards are identified and analyzed, qualified workers are selected to perform the work, controls are developed and implemented, prejob and pretask briefings occur to review the work plan, hazards and controls, work is performed within controls and has proper oversight, and feedback is collected to improve future work planning and execution. Implementing a single work control process will also ensure that work is performed in compliance with applicable DOE, contract, and Argonne requirements and expectations.

**Division Specific Information – ISMS Goals**

All employees in the division, including those that work in offices, have the same zero incident goal, i.e. zero injuries, zero illnesses, and zero releases to the environment.



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incorporated into work planning, qualified workers are selected and attend prejob/pretask briefings, and work is performed within controls.

**Division Specific Information – Information Flow [Top down]**

The division's information flow is captured in the lower half of Figure 6-1.

At the same time, ESH&QA program integration provides mechanisms for the upward communication of information regarding problems encountered during work and feedback for improving work performance. The upward flow of information is initiated during conversations between supervisors and employees that identify ways to do the work more effectively and efficiently. In some cases, these conversations result in requests to line management for support and resources that may eventually be resolved at a higher level of management.

**Division Specific Information – Information Flow [Upward]**

The division's information flow is captured in the lower half of Figure 6-1.

Numerous mechanisms support Argonne management's vertical integration of the ESH&QA program. Each division is structured to allow information to flow upward from the front line employee to the Laboratory director and back to the employee from upper management. Each division's ESH coordinator communicates with their associate Laboratory director (ALD) ESH/QA representative, who then can communicate concerns and problems to either the director of EQO, director of Compliance and Oversight, or to the ALD for whom they work. The ALD, as a standing member of the DSC, can bring the item to the Laboratory director and the directorate for consideration, and flow information back through their individual management chain to the front line employee.

This process is supplemented by the director of Compliance and Oversight. The director of Compliance and Oversight chairs the Oversight Coordinating Committee (EQO OCC) where the ALD ESH/QA representatives meet to raise their individual organization ESH&QA concerns and where the director of Compliance and Oversight communicates changes in requirements and vets policy and procedure changes to the ALD ESH/QA reps.

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The director of EQO participates in the Joint Union-Management Safety Committee, where front line union employee representatives bring their concerns about ESH&QA to the director of EQO, who then can discuss solutions with the OCC and the DSC and report progress and resolution back to the committee members. The director of EQO also has an open door policy for any employee to express a concern. The director sits on the Directors' Safety Council (DSC) where ESH&QA issues can be raised to the highest levels of Argonne management. The director of EQO participates in all Argonne Site Office partnering meetings held weekly. These communication paths enable the director of EQO to bring Laboratory-wide issues to the DSC and thus to the attention of the highest level of management at the Laboratory and the contractor, UChicago Argonne, LLC.

**Division Specific Information – Safety Committees**

The division has the following two standing safety committees:

- MSD Project Safety Review Committee
- MSD Accelerator Safety Committee

Other safety committees are formed ad hoc when needed.

**6.3 PEER INTEGRATION**

Peer (or horizontal) integration is the process of communicating ESH&QA requirements from the line managers to their work groups and among work group members. The peer communication channels also cut across work groups to others within the Laboratory who perform similar functions and who have similar ESH&QA functions, concerns, or problems. This process is both a formal and an informal one that allows for the sharing of ideas and solutions to ESH&QA concerns that arise in work with emerging science and technologies. The formality of this process can be graded up and down as needed and is encouraged through lessons learned and best practices. Peer integration describes the outward communication of ESH&QA requirements of the Laboratory at all work levels. This process works at each management level where the requirements are communicated and implemented and the performance of the requirements is monitored by the line managers among their peers and each employee in the organization under their lead.

**Division Specific Information – Peer Integration**

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**6.4 SUPERVISOR AND WORKER PARTICIPATION AND FEEDBACK**

On an individual level, supervisors and employees are required by the [Human Resources Policy 1300](#) to follow the established ES&H policies in all activities. Through training, work planning, and feedback, each supervisor and employee is active in the ISM process. Each is made aware of the safety expectations, how to raise concerns, their responsibility to stop unsafe work, and methods to perform work while keeping themselves and their coworkers safe. Supervisors and employees are involved in varying ways in the review of experiments and hands-on review of the applicable job safety/hazard analyses, work packages, or nonexperiment review process before conducting work. Recent improvements in the lessons learned program have resulted in the flow of valuable safety and hazard information to the front line supervisors and workers. Because worker feedback is a constant and on-going process, more time is needed to mature the lessons learned program and most importantly, develop and implement formal mechanisms to capture supervisor and worker feedback so that it can be shared across Argonne and the DOE complex.

Argonne understands that ESH&QA implementation and integration can be accomplished only through the participation of employees, users, and students in the process. Feedback is obtained through open forums where individuals can voice their concerns and suggestions, and when messages are delivered directly back to them from the management. Two such examples of this communication path are the IMPACT suggestion and CAT Chat processes.

Through the IMPACT program, employees improve the quality of Argonne's work environment by expressing concerns and suggesting ways to lower costs and improve safety, health, and productivity. The [IMPACT program](#) is described in the *Human Resources Policy and Procedure Manual*.

The Advanced Photon Source (APS) utilizes the Collaborative Access Team (CAT) Chat, a structured weekly meeting to exchange news and questions regarding operational issues, including safety challenges as encountered within the APS groups and throughout the DOE complex. This communication ensures the information is disseminated to the various user groups simultaneously. The [CAT Chat Index](#) website is located with the Argonne intranet.

In addition, workers participate in the ESH&QA process through assessments, providing input and feedback to the line manager and the division ESH coordinator and quality assurance representative (QAR), who communicates the collective concerns and feedback to the ALD ESH coordinator and QAR for use in vetting ESH&QA policies and programs. Employees are also represented on the Joint Union-Management Safety Committee, where safety concerns and issues can be brought directly to Laboratory management.

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Feedback to employees is recognized as an important aspect of each supervisor role in implementing the ISMS. In particular, supervisors are expected to conduct periodic walk throughs and safety inspections, and provide feedback to their employees regarding ESH performance. In addition, the annual performance appraisal for employees includes measures for ES&H performance, development, training adequacy and future training, tasking, and career development goals. It is required in [Chapter 1.5 of the ESH Manual](#) that the JHQ be reviewed at least annually and updated as required and within 90 days of reassignment to a new position, ensuring that each employee is receiving the required ESH training that maintains cognizance of the relevant procedures, techniques, and requirements for performing work safely.

**Division Specific Information – Supervisor & Worker Participation and Feedback**

Supervisors and office employees are encouraged to share and document lessons learned as part of the division's implementation of ES&H Manual Section 1.12, Feedback and Lessons Learned Program. The Argonne Lessons Learned Coordinator through the Division's Lessons Learned Point provides relevant lessons learned reports to those that work in office environments.

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## 7 OVERRIDING MANAGEMENT PRINCIPLES

### 7.1 LINE RESPONSIBILITY

Line management responsibility is built into each ESH&QA procedure at Argonne. All line managers are responsible for protection of the public, workers, and the environment. Within the Laboratory, responsibility for ESH&QA and hazard reduction at all levels is defined in the Argonne [Policy Manual](#) Chapter 7 and the Argonne [ESH Manual Chapter 1.1](#). Both of these requirements documents communicate that responsibility for safety starts with the Laboratory director and extends down to the line manager and ultimately to each individual at Argonne.

[Chapter 1.1 of the Argonne ESH Manual](#) details overall responsibilities with regard to ES&H compliance and implementation. The line responsibilities are further defined within the body of each individual chapter of the Argonne *ESH Manual*, allowing employees at all levels to understand what their specific responsibilities and roles are in performing work safely.

#### ***Division Specific Information – Line Responsibility***

Within MSD, the line responsibility for the scientific positions is organized according to the following scheme:

- Division Director
- Associate Division Directors (one serving as Deputy Division Director)
- Group Leaders
- Principal Investigators
- Scientific Associates, Junior staff, Postdoctoral Associates, Students (in some groups, these people report directly to the group leader)

Additional support staff report directly to the Division Director.

### 7.2 CLEAR ROLES AND RESPONSIBILITIES

As indicated above, the Argonne *Policy Manual* and *ESH Manual* contain ESH responsibilities for all individuals at Argonne. The [ESH Manual Chapter 1.1](#) defines broad responsibilities for ESH, and each *ESH Manual* section further defines the requirements and responsibilities for individuals based on the hazards that are being controlled by the section's requirements and procedures. A sampling of these roles and responsibilities includes:

**The Laboratory director** is responsible for setting the ESH&QA policies and provides direction on implementation strategies and budgets.

**ESH&Q and Performance Assurance (EQO)** and **Compliance and Oversight** groups maintain and coordinate changes to implementation documents such as the Argonne *ESH*

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*Manual* and *QARD*. They have established staff organizations of ESH, QA (subject matter experts, or SMEs), assessment, and oversight professionals independent of the line organizations, who consult to all levels of employees. The division director advises the Laboratory director on ESH&QA matters. EQO specifically:

- Provides Laboratory-wide ESH and QA support;
- Ensures corporate consistency relative to ESH&QA and ISMS implementation;
- Provides support to line divisions/departments;
- Provides ESH training, records, and training support;
- Ensures environmental monitoring, quality assurance expertise, and radiological controls and monitoring (including dosimetry);
- Fulfills specific responsibilities for procurement, maintenance, monitoring, and development of certain ESH&QA programs and materials such as instrument calibration and radiation dosimetry.

Compliance and Oversight specifically:

- Supports independent assessments of functional areas and provides personal with expertise in assisting divisions/departments in conducting their own management and self assessments, and
- Provides oversight.

**The associate Laboratory directors** have ESH&QA representatives that oversee the implementation of these expectations and who represent management for ESH&QA issues. Each division has an ESH coordinator and a quality assurance representative to work with the division and department staff.

**The division ESH coordinators** are the first line support for ES&H implementation for the line managers. In this capacity, the division/department ESH coordinator works with the line manager to effectively plan and conduct work in a safe, healthy, and environmentally compliant manner.

**Building managers and the divisions for whom they work** have landlord responsibilities for providing a safe infrastructure in which to perform work.

**Line supervisors** are responsible for planning and conducting the work in a safe, environmentally sound manner and must also ensure that worker training and qualifications are appropriate.

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**Line workers** are responsible for the safe performance of work, including planning, hazard identification, and implementation of work controls.

**The Laboratory safety committees** (outlined in the [Laboratory Committees Manual](#)) have been established to provide avenues for Laboratory employees and technical experts to advise the Director's Safety Council on the environment, safety, and health policies and programs. These committees are usually constituted to address specific regulatory responsibilities and workplace hazards that have broad application at Argonne, where there is dispersed technical expertise, or where there is a particularly hazardous activity warranting focused attention. Their role is to prepare and maintain the policies, requirements, and implementation procedures and serve as the SMEs for their area of responsibility. The Laboratory safety committees report to the Director's Safety Council on the relevant issues facing the Laboratory and propose paths forward. The makeup of the committees is wide ranging in order to represent all areas, affected organizations, and disciplines and to give representation to the greatest range of employees, visiting scientists, users, and in some cases, the public. Committees with specific ESH&QA responsibilities include but may not be limited to:

- Traffic Safety Committee
  
- Pressure Technology and Safety Committee
  
- Electrical Safety Committee
  
- Environment, Safety and Health/Quality Assurance Oversight Coordination Committee
  
- Transportation Safety Board
  
- Institutional Biosafety Committee
  
- Accelerator Safety Review Committee
  
- Director's Safety Council
  
- Occupational Injury and Illness Review Committee
  
- Radiation Safety Committee

**Every employee** at Argonne is responsible for following the requirements of the Argonne *Policy Manual*, the *ESH Manual* and all other tier 2 and tier 3 requirements and procedures when performing work. Each individual also has the authority and

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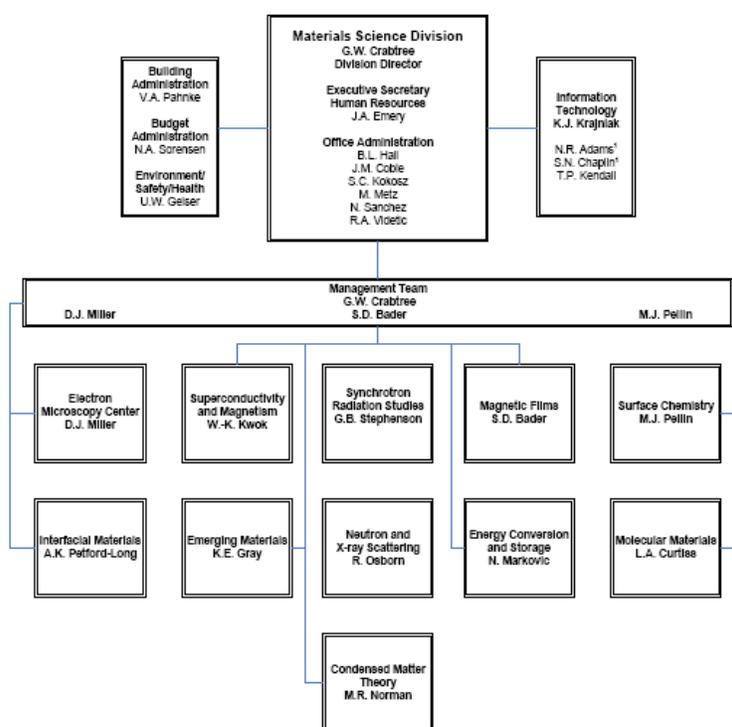
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responsibility to stop work that they believe is not safe or may cause environmental damage. The *Human Resources Policy and Procedure Manual*, [Policy 1300](#), contains specific requirements related to employee ES&H responsibilities. All employees and visitors are responsible for reporting incidents, unsafe acts and unsafe conditions as required by *ESH Manual* Section 1.7. This provides the framework for line management to evaluate the situation and develop and implement hazard controls before there is an impact to the worker, the public or the environment.

#### Division Specific Information – Clear Roles & Responsibilities



4/1/08

Division organization charts, position descriptions and communication with supervisors, provide office work employees with a clear understanding of roles and responsibilities.

**Visiting scientists and users who come to Argonne to conduct work** must also follow ESH&QA requirements established by the Laboratory director, Argonne policies, procedures, and work controls. Requirements are communicated down to the visiting scientist and users by the responsible *de facto* supervisor who is an Argonne employee

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and a member of the host division/department or user facility line management. This de facto supervisor receives the requirements for ESH&QA from the management integration process and communicates these responsibilities to their charges utilizing the peer integration process. Examples of these processes are listed below.

A guide to becoming a user at Argonne can be viewed at:

<http://www.aps.anl.gov/Users/index.html>

Specific user obligations can be viewed at:

<http://www.aps.anl.gov/Users/Obligations/index.html>

Flow down of safety and health requirements can be viewed in the ATLAS user agreement document available at:

[http://www.phy.anl.gov/atlas/users/GuestAgreement\\_Nonprop.pdf](http://www.phy.anl.gov/atlas/users/GuestAgreement_Nonprop.pdf)

Center for Nanoscale Materials user program can be viewed at:

<http://nano.anl.gov/users/index.html> and <http://nano.anl.gov/users/policy.html>

**Division Specific Information – Visiting Scientists and Users**

The Electron Microscopy Center within MSD is operated as a user facility. Its user program is described at:

<http://www.msd.anl.gov/groups/emc/users/>

For other visitors and users, there is no division-specific information.

**Subcontractors** working at Argonne must meet the Laboratory's safety requirements when performing work at Argonne. Requirements are communicated through the ANL-526, [Contract Terms and Conditions](#).

The following Clauses in the Terms and Conditions supply the requirements: 35 "Environment, Safety and Health," 10 "Clean Air and Water," 11 "Toxic Chemical Release Reporting," 36 "Environmental Protection," and 79 "Suspect/Counterfeit Parts."

A Job Safety Analysis (JSA) is required for all low, moderate, and high risk service contracts and construction contract awards. An example of the JSA instructions and forms can be viewed at:

<http://www.anl.gov/PRO/General%20Information/webforms/pd105.pdf>. Construction work requires submittal and Argonne approval of the supplying company's corporate ESH programs. High-risk service contractors must also submit the relevant sections of their corporate ESH programs for work that involves fall protection, lockout/tagout, confined space entry, or excavation. These sections are submitted for review and

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approval and are in addition to the JSA required for the full scope of work to be performed. High-risk service contract supplemental conditions can be viewed at: <http://www.anl.gov/PRO/General%20Information/webforms/366H.pdf>.

**Division Specific Information – - Subcontractors & Service Providers**

MSD follows the Argonne ESH Manual, Chapter 17.

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**8 EMPLOYEE SELECTION AND ASSIGNMENT TO WORK TASKS**

Employee competence is commensurate with responsibilities. Integrated safety management is more than just a plan, a series of charts, or a checklist. It is the way we do business, with the focus on the work and the people doing the work. Integration means that safety is a part of all work done at Argonne.

The responsibilities associated with an institutionalized ESH&QA program require specific levels of competence. Integrating environment, safety, health, and quality into all work requires that the individuals assigned to do the work have the knowledge, and skills, and abilities (KSAs) that are appropriate for their responsibilities.

**8.1 SELECTION OF EMPLOYEES**

The hiring process is crucial to maintaining a competent and cognizant staff. The hiring manager defines the critical skills and physical requirements for a position that must be filled. Before employment offers are made, the Laboratory Human Resources Division takes measures to ensure that the candidate meets the qualifications for the position. Promotions and transfers are also monitored by the Human Resources Division to ensure that appropriate requirements are met.

The Argonne position grades, career progression, and career descriptor forms can be viewed at the [compensation page of Inside Argonne](#).

When a position is considered technical in nature, it is designated by the 700-numbered grade series. Within this grade, an entry level employee for technical positions would normally begin at a 703 level and once at Argonne, work their way up in the pay grade to the 705 level. If an incumbent employee is to be moved into a 706 grade or higher, or if there is an outside employee with the requisite knowledge, skills, and abilities, a specific process must be followed to approve that incumbent employee for the grade 706 and higher position. Prospective employees for positions graded 706, 707, or 708 must be approved by the [Programmatic and Operations Committee – Hires and Promotions](#). The approval process is designed to ensure that new hires and promotions have capabilities commensurate with the responsibilities of their position and that hires and promotions are validated through an independent peer review and approval beyond the hiring manager and division director or ALD.

**Division Specific Information – Selection of Employees**

Hiring procedures are carried out in conformance with the procedures established in the Argonne Human Resources Policy and Procedures Manual.

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The availability of a position within a particular program is determined in a combined decision between the Principal Investigator, Group Leader, the Management Team, and the Division Director. In cases where budgetary constraints require decisions to be made between various programs, the ultimate decision is the responsibility of the Division Director. Qualifications for a position are determined by the Principal Investigator in consultation with the Group Leader. These qualifications will typically define particular experimental or theoretical skills and experience required to move the program toward its goals. These documents are reviewed by the Management Team member responsible for the program, and reviewed and authorized by the Division Director.

Candidates are solicited by a variety of means, including personal professional contacts, advertising in professional publications and at conferences, and internal job postings. Applicants are reviewed by the appropriate Management Team member, the Group Leader and the Principal Investigator to narrow to a short list. These are submitted to Human Resources to obtain letters of reference and any other items needed to establish a complete file, then Human Resources schedules interviews. Except in cases where travel is prohibitive and recommendations are exceptionally strong, hiring does not occur without an on-site interview.

Interviews consist of a formal seminar in which the candidates describe their work and experience, and informal interviews with several staff members selected for their abilities to make judgments on the established qualification. This group constitutes an *ad hoc* committee, with each member providing Division management with written recommendations and assessments of the candidate's qualifications. Based on these assessments, the letters of recommendation and any other support material that may have been acquired, the decision regarding which individual will be extended an offer of employment is made by consultation between the Principal Investigator, Group Leader, and the appropriate Management Team member. Final approval is given by the Division Director. In the case of position grades 706-710, approval is required from the Programmatic and Operations Committee on Hiring and Promotion (POC-HP), following procedures established by that committee and approved by the Associate Laboratory Director for Energy Sciences and Engineering.

Human Resources is then requested to tender an offer of employment to the selected candidate.

Short-term visitors (e.g. Visiting Scientists, summer university staff, etc.) are reviewed by the Principal Investigator and the Group Leader, with concurrence of the appropriate Management Team member and of the Division Director. Student visitors are processed using the procedures of the Division of Educational Programs.

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**8.2 TRAINING OF EMPLOYEES**

Newly hired employees receive an extensive new employee orientation. Others coming to the site, such as students, receive an orientation similar to new employee orientation. Users receive training based on the facility. As an example, APS user training requirements can be viewed on the "[Overview of User Safety Training Requirements](#)" site.

New employee training requirements are explained in [Human Resources Policy Manual Procedure 5100.2](#).

The orientations above all contain the basic responsibilities for ESH&QA requirements. To determine employee-specific training, individuals complete a [Job Hazards Questionnaire](#) (JHQ) that creates a training profile listing all safety training that is required and recommended for the work and hazards the employee will encounter. The JHQ is a dynamic document that is updated as appropriate to ensure compliance with changing policies and regulations. All new employees, site occupants, and visitors/guests/facility users who will be on site for more than two weeks in one calendar year and will not be escorted at all times must complete a JHQ to ensure that they receive appropriate training, including Environment, Safety and Health Orientation. The JHQ asks a series of questions regarding the activities the employee will be engaged in during the performance of their particular position. The answers to these questions in the JHQ provide outputs that feed directly into the Training Management System (TMS). When the employee completes the JHQ, an e-mail is sent to the employee's supervisor, who then reviews the JHQ. E-mail notifications of updates and revisions from the employee and the supervisor continue until the supervisor and employee agree on the contents. The supervisor then electronically signs and "approves" the JHQ. It is then uploaded to the Training Management System, and a training profile is generated. Supervisors are responsible for restricting employees from performing certain tasks until required training is completed. In some instances, supervisors may authorize employees to perform certain tasks only under the direct supervision of a trained employee or others. This ensures that Argonne staff has the competency and cognizance commensurate with their responsibilities regarding ES&H requirements.

Fulfilling training requirements is an important element in the overall ISMS because employees cannot remain cognizant and competent if their requisite training has expired or has never been completed. Because of this, and the need to maintain currency for regulation-required training, the [TMS automated system](#) generates an email reminder for the employee 90 days prior to training expiration, including a link for web-based training or a description of how to arrange to attend the required training (when available on site). Notices are also sent to supervisors to remind them that their employees are nearing a retraining or initial training deadline. After training has expired, the system generates

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reports to both the supervisor and the employee to remind them that they must complete the training. The internal system to maintain compliance and cognizance is valuable part of the ISMS.

The mechanisms established to ensure that all workers are prepared and able to perform work safely include completion of a JHQ, completion of required safety training, restrictions on duties based on currency of training, the experiment and nonexperiment safety reviews, qualification for the duties assigned, operational checks, safety checks (systems, equipments, instruments, etc.), and project management reviews.

**Division Specific Information – Training of Employees**

New employees are given orientation training which is supplemented by building specific and work area specific ESH/QA training. Also, all employees complete the electronic Job Hazard Questionnaire (eJHQ) which triggers the required training beyond new employee orientation. Building specific training is required annually to ensure employees maintain safety awareness and understanding of what to do in an emergency, e.g. calling 911, tornado shelter locations, evacuation assembly locations, etc.

The policy of the Division is to advance the training of its staff through formal education, seminars, training programs, and participation in professional society activities and other activities considered to be of mutual benefit to the Division and the staff. Such training will allow each employee to perform his or her job in an efficient and effective manner and in compliance with existing regulations. All in-house training activities should be documented, with records maintained in the Training Management System (TMS) where appropriate.

Ongoing scientific and technical training and development occurs through attendance at, and participation in, technical conferences, in-house seminars, technical workshops, and Group meetings. MSD encourages continuing education by paying for these expenses in keeping with the ANL Policy for education related to the job.

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### Chapter 9 BALANCED PRIORITIES

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## 9 BALANCED PRIORITIES

Balancing priorities is a process that begins early for projects at Argonne. At the initial work planning stage, when the scope of a project is identified in the Field Work Proposal (FWP) or the Work for Others (WFO) documentation, ESH&QA must be addressed with a detailed description available for all FWP/WFOs prepared. The requirement to include these elements in FWPs is identified in FWP instructions, section 21.

The [Checklist for WFO Proposals, number 7](#), requires inclusion of ESH and QA concerns.

The responsibility and authority for integrating ES&H considerations into work planning and conduct is clearly established within line management. Line management uses a graded approach in applying ES&H requirements that is based on the risk that an activity presents to personnel, the environment, Argonne, and the quality of the activity itself. Therefore, ensuring that ES&H considerations are given the highest priority (per [Chapter 7, Environment, Safety, and Health Protection](#), of the Argonne *Policy Manual*) is part of the role of line management. The process of determining the appropriate balance for the activity is implemented at all levels of Argonne through work planning. Oversight by line supervisors, support groups, oversight organizations, and committees provides feedback on the planning and facilitates implementation of the appropriate balance.

Specific work planning processes and requirements include:

- NEPA Implementation ([ESH Manual Chapter 10.2](#))
- Experiment Safety Review ([ESH Manual Chapter 21.2](#))
- Hazard Analysis Processes for Nonexperimental Work ([ESH Manual Chapter 21.1](#))
- Radiation Protection Procedures ([ESH Manual Chapter 5](#))
- ALARA Review Procedure ([ESH Manual Chapter 5.22](#))

In addition to the above work planning processes/requirements, Argonne work permits/forms are designed to facilitate a balanced priority approach when multiple safety and health hazards may be present. Some examples of such permits include:

- Radiological Work Permits ([ESH Manual Chapter 5.24](#)) identifies the radiological hazards and controls, as well as physical and chemical hazards and controls.
- Radiological Work ([ANL-206](#))
- Confined Space Entry Permit ([ESH Manual Chapter 7.4](#)) identifies physical and chemical hazards, as well as hazardous energy that must be controlled using the lockout/tagout procedure. ([ANL-614](#))

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- Digging ([FMS-006](#))
- Fire Protection System Impairment (PFS-525)
- Movable Structure Siting ([ANL-612](#)) and Movable Structure Occupancy Checklist ([ANL-613](#))
- Notification of Demolition and Removal (asbestos) (APC-430)
- Occupancy ([ANL-499](#))
- Open Flame and Spark-Producing Operations ([FD-48](#))
- Work Entry Clearance ([ANL-18](#))
- Energized Electrical Work ([ANL-211](#))
- Material Move Order ([ANL-8](#))

Collectively, the mechanisms mentioned help ensure that individuals are not placed in a position to compromise ES&H for schedule, financial, or technical considerations.

*Policy Manual* [Chapter 11.2, "Operation and Maintenance of Argonne Buildings and Facilities,"](#) discusses the responsibility for balancing priorities. *ESH Manual* [Chapter 1.1](#) and [Chapter 10.1](#) state that the Laboratory director is responsible for providing resources to implement the ES&H programs, and line management is given the responsibility to support the ES&H program and appoint appropriate personnel to implement it.

Argonne National Laboratory has developed a system to identify, integrate, prioritize, and propose funding for physical plant needs. This system integrates infrastructure and environment, safety, and health concerns and was developed to meet the following expectations:

- Establishment of an integrated and documented process to identify, prioritize, fund, and execute physical plant-related environment, safety, health, and infrastructure (ESH&I) needs regardless of funding source or program.
- Ensure that the management process for producing the integrated priority list uses recognized risk-based prioritization methods balanced against other priority considerations to support Laboratory management resource allocation decisions.
- Ensure that senior Laboratory management is cognizant of all unfunded risks and vulnerabilities and has approved any temporary mitigative actions taken to manage those risks until they can be permanently resolved.
- Provide the opportunity for appropriate stakeholder participation in the ESH&I prioritization and planning in support of the site's program missions, budgets, planning estimates, and performance outcomes.

**Worker Safety and Health Program/Integrated Safety Management System Description****Chapter 9 BALANCED PRIORITIES**

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- Document how the ESH&I plan is prepared and executed, including how changes to the plan are identified, controlled, and approved.

The process of balancing the priorities and ranking of priorities can be viewed at:

[http://www.tis.anl.gov/db/doccenter/full\\_document/DDD/272.pdf](http://www.tis.anl.gov/db/doccenter/full_document/DDD/272.pdf)

An example of the forward planning for ESH&I can be viewed at:

[http://www.tis.anl.gov/db/doccenter/full\\_document/DDD/215.pdf](http://www.tis.anl.gov/db/doccenter/full_document/DDD/215.pdf)

Items identified for addition to the ESH&I list come from across the Laboratory at many levels. The sources for identification of items that should be added are:

- Extent of condition assessment surveys
- Asbestos and other hazardous materials surveys
- Life safety and fire protection assessments
- Decommissioning and decontamination studies
- Environmental surveys
- Programmatic input
- Internal and external safety resources
- Management audits and inspections
- Department or division semiannual ES&H inspection
- Self assessments

Facility needs are also identified through the Argonne Ten-Year-Site Plan development processes.

Findings are communicated through specific stakeholders within each division and ALDship, which then places the items, if not immediately corrected, onto the ESH&I listing. If an ESH&QA situation becomes a stumbling block for a project, deadline, or task, line management is required to comply with the tier 1 and tier 2 requirements and approved tier 3 implementing procedures applicable to the work activity (see [ESH Manual Chapter 1.1.3](#)).

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The requirement and commitment to perform work safely is reinforced by the policy to stop work and the restart authorization process outlined in [ESH Manual Chapter 1.1](#). The Argonne *Policy Manual* contains the overall policy for stop work in [Chapter 7.1](#).

**Division Specific Information – Balanced Priorities**

MSD implements Argonne's plan for balancing priorities as outlined above, where applicable.

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**10 DEFINING THE SCOPE OF WORK****10.1 LABORATORY LEVEL**

The contract for the operation of Argonne establishes the overall statement of work for the Laboratory, and contains explicit expectations and performance measures related to the safe and environmentally protective performance of work. The Statement of Work [article C.4(c)(2)] clearly reflects the requirement to have an integrated safety management system.

The annual budget/work authorization process defines the work to be done each year. Work performed for DOE begins with submission of field work proposals (FWPs) that define the work planned for the current year and the following two years within that program. The FWP form asks if the proposal does work that includes a security interest and NEPA requirements, and ES&H considerations are detailed. In addition, the budget is detailed in the Management and Proposal Planning System (MAPPS). The requirement to include these elements in FWPs is identified at [FWP instructions](#), section 21.

Subsequent to that submission, DOE reviews the plans on-site for the current and future years, with recommendation for modification of the work plans defined in the FWP. In some cases, projects that are not funded directly by DOE are termed Work for Others (WFO). An automated screening tool identifies the documentation required for a project and subsequently becomes the application for work approval. [WFO Page 5, number 7, identifies the need to identify ESH and QA concerns.](#)

Finally, at the beginning of the fiscal year, a financial plan is sent to the Laboratory describing the work for the year and the fund allocation for each work package. During the fiscal year, the financial plan is refined each month, adding or subtracting work/money. Work performed for others includes Inter Entity Work Orders, Other Federal Agencies, and Cash Work for Others. A MAPPS budget, containing check boxes for security interest and NEPA requirements, is completed for these projects.

Work is also defined within the construction authorization system. This includes General Plant Projects and congressional line item construction projects. The Laboratory prepares Conceptual Design Reports and appropriate NEPA documentation and submits requests for Project Directives to the Contracting Officer. Approval of the project includes approval of the cost, scope, and schedule. Significant changes to the project require approval by the Contracting Officer. The Laboratory's priorities for ESH and infrastructure (I) funding requests are set through the Laboratory's ESH and I prioritization process.

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Weekly meetings are held between the DOE ASO contracting officer representative and the Directorate to discuss contractual issues, reporting requirements, ES&H performance, project progress, and other administrative matters. Additional meetings are held between ES&H personnel in the DOE ASO and the EQO director to discuss ES&H issues of mutual interest.

Laboratory performance measures, including ES&H performance measures, are established annually by DOE ASO to support the conduct and evaluation of the work. Performance measures are communicated to Argonne line management, ES&H professionals, and other employees.

**10.2 DIVISION/DEPARTMENT LEVEL**

A number of mechanisms allow the associate Laboratory director, division director, or department head to define the work at an ALD, division, or department level. For example, divisions/departments participate in the annual budget process described above. Thus, an FWP prepared by the division/department head describes their anticipated work. With the arrival of the financial plan, the ALD authorizes the division/department to conduct the work described in the plan. The full process is described in [Chapter 1.2 of the Argonne Budget Manual](#).

The ALD provides direction to the division/department for development of specific plans related to the program, organizational, and project management plans and budgets. ESH&QA review and advice is provided by the division/department ESH&QA representatives, ALD ESH&QA representatives, and EQO.

**10.3 PROGRAM/ACTIVITY LEVEL**

Line organizations are responsible for planning the work, identifying ESH&QA concerns, and securing resources needed to support the work. Once annual operating plans are developed, work planning and project management is the responsibility of the division/department heads.

**Division Specific Information – Defining the Scope of Work**

The scope of office work activities are defined by the division's mission and goals. Office employee specific work is defined in the employee's position description. The scope of all scientific work is defined by the proposals that fund the work. The majority of MSD's work is funded by DOE field work proposals, which are reviewed on a three-year cycle. On a more local scale, the scope of experimental laboratory work is also defined in the project safety review documentation.

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**11 IDENTIFYING AND ANALYZING HAZARDS****11.1 PROJECT LEVEL HAZARDS**

Before work is performed at Argonne, hazards are identified and analyzed so that appropriate controls can be developed. The two formal processes by which hazards and controls are identified and work documentation is prepared are:

- The [experiment safety review](#) and
- The [hazard analysis for nonexperimental work](#).

The first process is used by Argonne experimenters in order to ensure that there has been a hazards analysis of the experiment and that controls have been put into place to mitigate all ES&H concerns. The second process is required for all divisions or departments; each must have a hazard analysis process in place even if they do not conduct experiments.

APS users complete a form called an Experiment Safety Assessment Form, which then goes into the [experiment safety review system](#). Upon completion and prior to commencement of work, the form must be reviewed and approved by the Argonne APS SMEs for the hazards that are identified based on the description of the experiment.

Researchers coming to work at the ATLAS facility must complete the Physics Division [Experiment Safety Review](#).

Other examples of hazard identification and controls processes at Argonne are:

- The use of the [General Purpose Powder Diffractometer](#) at IPNS
- The guide to becoming a user at the [Center for Nanoscale Materials \(CNM\)](#)
- The use of the [Chemistry Division's Building 211 facilities](#)
- The [safety screening process used by resident users and Collaborative Access Team](#) at BioCAT for users coming to their facility (compliments the APS process)

The Emergency Management department completes and maintains a hazard evaluation for each building ([view an example](#)). This survey shows basic hazards in a facility; specific hazards can be added as necessary. The information is primarily for the first responders, but can also be used in the development of ESH108xxx curriculum, [building safety orientation](#). Each employee assigned to work in a building on site must complete specific building orientation for that building during which hazards within the building are identified.

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**Division Specific Information – Project Level Hazards**

All experimental work in MSD must undergo a project safety review, which includes a hazard analysis and the development of hazard controls.

Users of the MSD Electron Microscopy Center (EMC) must describe the hazards of their proposed experiments to the EMC staff as part of the experiment proposal process. EMC staff decide whether the proposed experiments fall under the safety review envelope of the EMC, or whether a separate safety review for the proposed experiment is required.

**11.2 WORK LEVEL HAZARD**

Individual employees complete a Job Hazards Questionnaire (JHQ) as outlined in Chapter 8, Section 8.2, Training of Employees. This is used to determine the requisite environment, safety, and health training and establish the physical capabilities needed to perform their work. The JHQ is also used to trigger appropriate medical surveillance programs required based on employees' potential exposures, equipment that must be used, and OSHA, DOT, or ACGIH requirements and guidelines.

Employees are expected and encouraged to identify and report ESH&QA issues to their supervisor. The supervisor is expected to respond to issues brought to their attention by the employee and to perform inspections and surveys to identify and mitigate hazards. Additional assistance for inspections and surveys can be obtained from the division's ESH coordinator, the ALD ESH&QA representative, or EQO, as appropriate.

In parallel with these specific hazard analysis efforts, the line organizations, supported by EQO, perform inspections and surveys to identify and mitigate hazards, including industrial hygiene, radiation surveys, and ventilation surveys to monitor flow performance of local exhaust systems used to control hazardous air contaminants.

**Division Specific Information – Work Level Hazard**

Typically, office work activities do not require a work planning and control process to address hazards of the work. As such, the focus is to provide a safe office environment that encourages environmental responsibility. ES&H Manual Section 1.10, Occupancy Permit System and Section 7.10, Office Safety, are designed and implemented by the division to identify hazards so safety can be maintained in office areas. Supervisor observation and employee awareness ensure that work is performed within controls. Supervisors and employees are responsible for identifying, reporting and correcting, as appropriate, unsafe behaviors and unsafe conditions. In some cases, the building manager is notified and coordinates corrective actions to address unsafe conditions that

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are beyond the capabilities and qualification of supervisors or employees. Periodic safety inspections are conducted by division ES&H/QA personnel and/or supervisors to ensure office areas are maintained in a safe state and hazards are adequately controlled.

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**12 DEVELOPING AND IMPLEMENTING ESH&QA / WSHP CONTROLS****12.1 LABORATORY LEVEL**

The documents that establish the Laboratory-wide ESH&QA controls for the Laboratory's work and operations are the Argonne [ESH Manual](#) and the *Argonne Quality Assurance Requirements and Description*.

By supplementing these manuals with hazard specific manuals for certain operations or classes of tasks, such as the [Hoisting and Rigging Manual](#), Argonne ensures that ES&H controls remain adequate and a graded approach is used for the selection of controls appropriate for the work being performed.

**12.2 DIVISION/DEPARTMENT LEVEL**

Division and department ESH coordinators provide local, line management safety expertise for the tasks that are being performed within the division or department. The divisions and departments have the responsibility to develop the appropriate documentation outlined in *ESH Manual Chapter 21* for experimental and nonexperimental work. Because each organization is responsible for designing the review and approval process, the review and oversight provided by the line is familiar with the planned work and ES&H controls outlined in the planning stage. Line responsibility also ensures that appropriate controls are developed along with the work plan, the controls are graded, and the line organization monitors the work as it is conducted.

**12.3 FACILITY/PROJECT LEVEL**

Prior to the start of any project, a project execution or implementation plan and resource-loaded schedule are developed. ES&H standards are integrated into these planning documents. The execution plan and schedule are reviewed by the DOE ASO technical peers and ES&H SMEs for adequacy prior to the commencement of the project and periodically during course of the project.

To ensure that all ES&H related disciplines are incorporated into all projects, *ESH Manual Chapter 17.1* requires that all projects, during the conceptual design and baseline stages, be sent to EQO for review and comment. Every ES&H SME associated with the project will review the documents and make comments accordingly. If the comments are significant, the SME is required to attend and must be invited to the prebid meeting to ensure that all ES&H concerns are addressed and understood by the contractors. After the project is awarded and execution of the project transpires, the ES&H contractor safety engineer and the safety inspectors will perform random oversight activities in the field to ensure that ES&H directives are being adhered to.

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ESH oversight will also randomly conduct oversight activities eight hours weekly per SME on all active projects. A daily call log is copied to EQO to ensure that the SMEs are aware of the projects being conducted on site.

**12.4 WORK ACTIVITY LEVEL**

Formalized checklists, written hazard analyses, and procedures are used to ensure adequate ES&H controls are in place for complex experiments or operations involving significant hazards, such as electricity, oxygen deficiency, and confined space. Often, technical committees are established to ensure that technical basis for the controls is sound. Specific Argonne permits and planning steps are initiated when the project is being planned, equipment purchased, services contracted, or work scope developed.

Argonne recognizes that written requirements cannot make a project or a workplace safe. Worker involvement comes from on-the-job experiences and observed or utilized safety practices. Safety and productivity are vested in the workforce. Argonne recognizes the value of a worker's involvement in the hazard assessment process.

Table 12-1 gives examples of the mechanisms Argonne workers use to identify hazards. Each control must be executed by individuals who are qualified in hazard recognition, familiar with the work activities and working environments, and know which safety requirements can be met with a graded approach and which cannot. They also must be able to judge the adequacy of controls using a graded approach, and be aware of their own limits in authority and competence.

**Division Specific Information – Developing and Implementing ESH&QA / WSHP Controls**

The project safety review process documents the controls required to mitigate the hazards of experimental laboratory work.

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### Chapter 12 DEVELOPING AND IMPLEMENTING ESH&QA / WSHP CONTROLS

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**TABLE 12-1 Methods of Hazard Identification**

<b>Project/Task Specific Examples</b>	
Formal Identification and Control	Experiment safety review, including environmental evaluation (NEPA): At initiation of project or activity When significant changes occur, especially beyond authorized "envelope" Periodic review for adequacy; updates as appropriate Preparation of Safety Analysis Report and supporting documents Preparation of Safety Analysis Document (for accelerators) Review of equipment designs Review of facility designs Review of requisitions for chemicals Review of requisitions for equipment Approval of work permits such as: Energized electrical work permit Work entry permit Radiation work permit Occupancy permit Hot work permit Open flame permit Digging permit Confined space entry permit Review of shipping requests Review of requests for contractor services Design review process Baseline Survey Review of Argonne service requests Job Safety Analysis preparation JSA review by all employees prior to start of work Signing JSA
<b>Program/Process Oriented Controls</b>	
Formal and Informal	Scheduled facility inspections Ad hoc, informal observations by managers and supervisors Ad hoc, day-to-day hazard recognition by all employees Periodic and ad hoc observations, evaluations, and monitoring of progress

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**13 HAZARD CONTROL TAILORED TO THE WORK BEING PERFORMED**

Engineering and administrative controls are in place to prevent and mitigate ES&H hazards while incorporating the applicable safety-related QA requirements. Many of these controls are discussed in the Argonne [ESH Manual](#) and the Argonne [Environmental Management System Description](#) and the Argonne [Quality Assurance Requirements and Description](#). The controls are tailored to the work being performed. Employee participation is extremely important in this area of work planning and becomes compulsory for certain tasks and hazards. Lessons learned from incidents or earlier experiences with similar work activities are reviewed and integrated into the hazard controls.

The *ESH Manual* and other manuals for operational safety contain a graded approach for the hazards presented and allow for flexibility in the approach to compliant, environmentally and health protective, safe work. The process also allows for consideration of controls outside those indicated through a review and variance process that allows for the situations that have never existed due to the nature of the R&D environment in which we operate.

The two formal processes by which hazards and controls are identified and work documentation is prepared are:

- The [experiment safety review](#) and
- The [hazard analysis for nonexperiment safety](#).

The first process is used by Argonne experimenters in order to ensure that there has been a hazards analysis of the experiment and that controls have been put into place to mitigate all ES&H concerns. The second process is required for all divisions or departments; each must have a hazard analysis process in place even if they do not conduct experiments.

To illustrate the relationship between the Argonne experiment safety review process and the hazard analysis process for nonexperiment safety work, and the graded approach in which they are applied, crosswalks to the ISM core functions and guiding principles and the experiment safety review and hazard analysis process for nonexperiment safety work are shown in Tables 13-1 and 13-2.

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**TABLE 13-1. Crosswalk of the Experiment Safety Review Process and ISM**

<b>ISM Core Functions</b>	<b>ISM Guiding Principles</b>	<b>Implementing the Core Functions and Guiding Principles in the Experiment Safety Review Process</b>
	1. Line management responsibility  2. Clear roles and responsibilities	Division director is responsible for establishing and implementing the ESR process  Investigator is responsible for preparing ESR documents for review  Investigator has primary responsibility for identifying the hazards and controls  Standing or ad hoc committee is responsible for review and recommendation  Division director or designee is responsible for ESR approval and approval for work to start
	3. Competence commensurate with responsibility	Training and qualification of experimenters is documented and considered during review  Reviewers must be technically qualified
1. Define the scope of work	4. Balanced priorities	The process generates an approved "work plan" prior to beginning work  The process integrates technical planning and ESH&QA planning  Investigators devote effort to serving as reviewers  Graded approach allows variable-degree of formality and rigor; level of approval
2. Analyze the hazards		Includes consideration of hazards in context of the working environment  Includes "what-if" analysis to identify vulnerabilities and credible events  Includes results of design review for custom fabricated or assembled equipment

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<b>ISM Core Functions</b>	<b>ISM Guiding Principles</b>	<b>Implementing the Core Functions and Guiding Principles in the Experiment Safety Review Process</b>
<p>3. Develop/ implement hazard controls</p>	<p>5. Identify standards and requirements</p> <p>6. Develop/ implement hazard controls tailored to work performed</p>	<p>Process includes demonstrating conformance with hazard-specific standards and requirements, largely as presented in Argonne manuals.</p> <p>Includes standards and requirements defined by prior design review</p> <p>Process includes identification of topic-specific applicable reviews &amp; approvals</p> <p>Includes facilities standards (e.g. fire and life safety, lighting)</p> <p>Includes identification of relevant Argonne standards and requirements</p> <p>Procedures (tailored) must be prepared as needed to assure safe work</p> <p>Process includes establishment of boundaries and limits (safety envelope)</p> <p>Process includes confirmation that controls are adequate</p>

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<b>TABLE 13-1 (Cont.)</b>		
<b>ISM Core Functions</b>	<b>ISM Guiding Principles</b>	<b>Implementing the Core Functions and Guiding Principles in the Experiment Safety Review Process</b>
4. Perform work within controls	7. Authorization of operation	<p>Division director or designee must approve work plan prior to start</p> <p>Significant changes require review and updated authorization</p> <p>Other approvals and work permits may be required (e.g., for lasers; occupancy; open flame)</p> <p>All personnel must be familiar with procedures, practices, standards, and expectations Supervisors responsible for workplace observations to assure work conforms with plan and competencies are commensurate with responsibility assigned</p>
5. Provide feedback/continuous improvement		<p>Investigators receive feedback during the review process</p> <p>Participation as a peer reviewer promotes safety</p> <p>Periodic assessment of the review process is required</p>

#### **Division Specific Information – Experiment Safety Review Process**

The MSD Experiment Safety Review Process (also known as Project Safety Review Process) consists of a guidance document, a safety analysis form, and a project participant list available on the division-internal website.

#### **Division Specific Information – Experiment Safety Review Process Change Control**

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**TABLE 13-2. Crosswalk of Hazard Analysis Process for Nonexperimental Work and ISM**

<b>ISM Core Functions</b>	<b>ISM Guiding Principles</b>	<b>Implementing the Core Functions and Guiding Principles in the Hazard Analysis for Non-Experiment Safety Process</b>
	<p>1. Line management responsibility</p> <p>2. Clear roles and responsibilities</p>	<p>Division director/department heads are responsible for ensuring that a hazard analysis process is in place for nonexperimental work activities.</p> <p>Requester is responsible for preparing the scope of work for the review.</p> <p>Line supervisors must:</p> <ul style="list-style-type: none"> <li>Identify work activities, hazards and controls.</li> <li>Review Tier 2, 3 and sub tier 3 documents.</li> <li>Develop a work plan and controls if none are already in place.</li> <li>If no existing hazard analysis for work is in place, complete a Hazard Assessment Checklist, (<a href="#">ANL-644</a>)</li> </ul> <p>Employees must review hazard analysis.</p>
	<p>3. Competence commensurate with responsibility</p>	<p>Training and qualification of requester is considered during assignment of employees to the task.</p> <p>Training Management System alerts and reminders keep supervisors abreast of the status of employee qualifications and JHQ update policy ensures employees are possess technical competency.</p> <p>Line supervisor must be technically qualified to direct the work.</p>
<p>1. Define the scope</p>	<p>4. Balanced priorities</p>	<p>The process generates a completed Hazard Analysis Checklist that must be reviewed prior</p>

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<b>ISM Core Functions</b>	<b>ISM Guiding Principles</b>	<b>Implementing the Core Functions and Guiding Principles in the Hazard Analysis for Non-Experiment Safety Process</b>
of work		<p>to beginning work.</p> <p>The process integrates technical planning and "safety" planning.</p> <p>Employees/workers devote effort to serving as reviewers.</p> <p>Graded approach is applied in the determination of low, moderate or high risk</p>
2. Analyze the hazards		<p>Includes consideration of hazards in context of the working environment.</p> <p>Development of work description includes "what-if" analysis to identify vulnerabilities and credible events.</p> <p>Development of work description includes review of associated equipment.</p>

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**TABLE 13-2 (Cont.)**

<b>ISM Core Functions</b>	<b>ISM Guiding Principles</b>	<b>Implementing the Core Functions and Guiding Principles in the Hazard Analysis for Non-Experiment Safety Process</b>
3. Develop/ implement hazard controls	5. Identify standards and requirements  6. Develop/ implement hazard controls tailored to work performed	<p>Process includes demonstrating conformance with hazard-specific standards and requirements, largely as presented in Argonne manuals.</p> <p>Includes standards and requirements defined by prior hazard analysis and review.</p> <p>Includes evaluation of facilities standards (e.g., fire and life safety, lighting).</p> <p>Includes identification of relevant Argonne standards and requirements.</p> <p>Procedures (tailored) must be prepared as needed to assure safe work.</p> <p>Process includes establishment of hazard controls.</p> <p>Process includes confirmation that controls are adequate.</p>
4. Perform work within controls	7. Authorization of operation	<p>Supervisor or higher level manager must approve work plan before start.</p> <p>Significant changes require updated authorization.</p> <p>Other approvals may be required (e.g., open flame, confined space).</p> <p>All personnel must be familiar with procedures, practices, standards, and expectations. Supervisors responsible for workplace observations to ensure work conforms to plan.</p>
5. Provide feedback/ continuous		<p>Work planners receive feedback during the review process.</p>

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improvement		<p>Employee/worker participation as a peer reviewer promotes safety.</p> <p>Update of the HA is required for changes and retention for future use is required.</p>
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#### **Division Specific Information – Non-experiment Safety Process**

The divisional process for non-experimental work (excluding routine office work) utilizes form ANL-629, Job Safety Analysis (internal) in conjunction with a risk-rated divisional hazards checklist. The documentation is prepared by the worker, and reviewed by the supervisor and the ESH Coordinator (for high hazard work, Subject Matter Expert are also involved in the review).

#### **Division Specific Information – Non-experiment Safety Process Change Control**

#### **Division Specific Information – Office Activities**

Division implementation of ES&H Manual Section 1.10, Occupancy Permit System and Section 7.10, Office Safety, ensures that hazards are appropriately controlled and control measures are being maintained in office areas.

Change control in the office environment applies when employees transfer to new positions. As such, the change is controlled by updating the employee's position description and eJHQ to inform the employee of their new roles and responsibilities, and trigger new training requirements.

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**14 IDENTIFICATION OF ESH&QA STANDARDS AND REQUIREMENTS**

The Prime Contract contains ESH&QA requirements that must be met as a minimum performance standard. The contract also identifies compliance with applicable federal, state, and local regulations that contain ES&H rules. Contractual requirements are identified as Laboratory policy in the Argonne *Policy Manual*. [Chapter 2.1](#) defines and describes the Argonne policy system and the flow down of requirements through the tier 1, tier 2, and tier 3 manuals. The Argonne *Policy Manual* contains the overall Laboratory ES&H policy in [Chapter 7](#) and overall Laboratory Quality policy in [Chapter 12](#).

Consistent with the hierarchy defined in Chapter 2.1, the implementing policy and procedure for ES&H policy in Chapter 7 is the [ESH Manual](#). The *ESH Manual* is supplemented by more detailed policy and procedure documents where needed or where an especially robust and rigorous program has been developed and is maintained for a specific topical area. Examples of this type of tier 2 supplemental manual are the [Hoisting and Rigging Manual](#); the [Hazardous Materials Transportation Safety Manual](#); and the [Spill Prevention, Control, and Countermeasures Plan](#). Because these are requirements documents, line management is responsible for ensuring compliance during work planning and execution, and ensuring that employees report back through their line management and divisional ESH coordinator/QA representative any difficulties with compliance, improvement opportunities, inconsistencies, or suggestions related to the effective implementation, work integration, and overall protection afforded by compliance with the policies.

Management integration is the process through which the ESH&QA standards and requirements are communicated from the Laboratory director through the organization to the front line supervisor. Once communication has reached the front line supervisor, it is that individual's responsibility to ensure that both employees and unescorted visitors under their authority are properly informed of the health and safety hazards to which they may be exposed and the quality requirements they are responsible for implementing. The supervisor must also ensure that individuals are properly trained in ESH&QA and emergency procedures, properly equipped, provided with a safe and healthy workplace, and have competence that is commensurate with their ESH&QA responsibilities. Supervisors are further required to ensure that position descriptions and formal performance evaluation documents include specific ESH&QA expectations and that the expectations related to these documents are reviewed with the employee on an annual basis or any time an employee's job assignment changes. Argonne [ESH Manual Chapter 1.1](#) contains specific responsibilities for each level of management. The responsibilities for line supervisors contain a specific set of requirements for identifying and communicating hazards and controls to their employees.

**Division Specific Information – Identification of ESH&QA Standards & Requirements**

There is no additional division-specific information.

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**14.1 ASSESSING PERFORMANCE FOR CONTINUOUS IMPROVEMENT**

Assessments are a means of collecting information about the ESH&QA program performance. Reliable, timely information is important in order for the Directorate to monitor the Laboratory's ESH&QA performance against contractual requirements, raise ESH&QA awareness among employees, identify lessons learned that can be used to accelerate improvements, feel confident that vulnerabilities are aggressively sought out and mitigated responsibly, evaluate how well the Laboratory is fulfilling all regulatory requirements, and provide data for making risk-based decisions on resource allocations and program direction.

Argonne is committed to implementing a strong ESH&QA assessment program. This program consists of independent assessments (IA), management assessments (MA), and self assessments (SA). The director of Compliance and Oversight and the assessment program manager oversee and administer the overall program. The IAs are scheduled by Compliance and Oversight and the assessment program manager administers and oversees the contractors. Results are channeled through the appropriate ALDs and to the DSC as needed. Lessons learned are generated as they are found during the IAs, MAs, and SAs. The assessment program manager mentors and guides the line management in the conduct and preparation of documentation for MAs and SAs. In addition, the assessment program manager will guide and assist EQO in conducting MAs and SAs on its own operations. A resource-loaded, prioritized schedule for IAs is prepared a fiscal year in advance and is adjusted as needs arise and are approved by the director of Compliance and Oversight.

Argonne is committed to implementing the U.S. Department of Energy's (DOE's) Line Oversight (LO) Policy and Contractor Assurance System (CAS) initiatives. LO/CAS requires contractors to develop an integrated, risk-based system for assessing, improving, and ensuring an acceptable level of contractor performance. Currently, the Argonne CAS focuses on environment, safety, and health. CAS is a validation tool that is used to ensure that the ISMS is functioning properly. CAS uses pieces of the ISMS in its implementation and dovetails with the ISMS in both the use of lessons learned and its focus on continuous improvement of the overall program. Because of this interface, CAS is valuable as a part of ongoing validation of the ISMS.

**Division Specific Information – Assessing Performance for Continuous Improvement**

In the office environment, supervisor observation and employee awareness ensure that work is performed within controls. Supervisors and employees are responsible for identifying, reporting and correcting, as appropriate, unsafe behaviors and unsafe conditions. In some cases, the building manager is notified and coordinates corrective actions to address unsafe conditions that are beyond the capabilities and qualification of supervisors or employees.

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Periodic safety inspections are conducted by division ES&H/QA personnel and/or supervisors to ensure office areas are maintained in a safe state and hazards are adequately controlled.

**14.2 FEEDBACK AND IMPROVEMENT**

Argonne's established requirements contain mechanisms for feedback and improvement into the work processes and to formal policies. These mechanisms begin with the revision requirements as outlined in the Argonne [Policy Manual Chapter 2](#), which contains requirements for review and updating of any tier 2 document. This process is automated in the Policy and Procedures system, which generates a notice to the tier 2 document designee that a review must be performed. Subsequent notices are sent to the designee, owner (division director), and ALD for OPS. This process ensures that the tier 2 documents are reviewed for accuracy and currency at a regularly scheduled interval. Some regularly scheduled reviews include:

- Periodic review and update of policies, plans, procedures, position descriptions for
  - Conformance with current requirements
  - Consistency with organizational structure and current work activities
  - Quality of implementation, including personnel performance evaluation
- Internal assessment process
  - Management assessment
  - Self assessment
  - Independent assessment
- Tracking of corrective actions and improvement plans
- Facility inspections (general and topic-specific)
  - Inspection of tools, equipment, and facilities (including QA requirements with safety implications)

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- Testing and maintenance of safety-related equipment
- Scheduled, planned, and *ad hoc* evaluations and reviews by the division, Argonne, EPA, and others
- Critique and investigation of incidents (in division, at Argonne, and elsewhere)

Argonne National Laboratory is committed to a policy of aggressive self-identification and self-reporting noncompliances with 10 CFR 851 Worker, Safety and Health requirements, including the development and implementation of corrective actions to prevent recurrence.

Variations from environment, safety and health policies are allowed only in compliance with *ESH Manual Chapter 1.4*, which incorporates the variance process found in 10 CFR 851.

**Division Specific Information – Feedback & Improvement**

Supervisors and office employees are encouraged to share and document lessons learned as part of the division's implementation of ES&H Manual Section 1.12, Feedback and Lessons Learned Program. The Argonne Lessons Learned Coordinator through the Division's Lessons Learned Point provides relevant lessons learned reports to those that work in office environments.

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**15 SUMMARY**

In summary, Argonne's ISMS and WSHP is a function of many different policies, procedures, processes, and activities. No single document can contain the "requirements" for an integrated system. Rather, the processes of environment, safety, health, and quality assurance flow through everyday activities to meet the expectations of the performance-based management contract between the UChicago Argonne, LLC, and DOE.

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**16 APPENDICES****APPENDIX A CONSTRUCTION SAFETY**

Argonne's construction safety program is outlined in [Chapters 17.1, 17.2, and 17.3](#) of the Argonne *ESH Manual*. The program includes provisions for approval of the contractor's Worker Safety and Health Program and a graded approach on the needs for submission of a WSHP and the criteria to be used for approval of the program.

**Division Specific Information – Construction Safety**

MSD follows chapter 17 of the Argonne ESH Manual when dealing with construction contractors.

**APPENDIX B FIRE PROTECTION**

The Argonne fire protection program is defined in *ESH Manual* [Chapter 11.1, "Fire Protection Program and Responsibilities."](#)

Specific fire safety programs are delineated in the whole of [Chapter 11](#), as appropriate for the individual focused area. Argonne has an Authority Having Jurisdiction (AHJ) position for Fire Protection, as agreed and approved by DOE, with responsibility for rulings and documentation of judgments made within the confines of the applicable codes and standards allowing rulings and decisions by an AHJ for fire protection issues.

**Division Specific Information – Fire Protection**

There is no division-specific information on fire protection.

**APPENDIX C PRESSURE SAFETY**

The Argonne Pressure Safety Program is defined by *ESH Manual* [Chapter 13.1](#) and [13.2](#). Argonne maintains a [Pressure Technology and Safety Committee](#).

**Division Specific Information – Pressure Safety**

There is no division-specific information on pressure safety.

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**APPENDIX D INDUSTRIAL HYGIENE**

Much of the industrial hygiene program is driven by individual hazardous materials management and the management of chemical and laboratory hazards. The bulk of the IH programs can be found in *ESH Manual* Chapter 4. The chapters are:

- [4.1 "Hazard Communication"](#)
- [4.2 "Chemical Hygiene Plan"](#)
- [4.3 "Laboratory and Chemical Safety"](#)
- [4.4 "Asbestos"](#)
- [4.5 "Chemical Carcinogens"](#)
- [4.6 "Beryllium"](#)
- [4.7 "Alkali Metals"](#)
- [4.12 "Safe Handling of Lead"](#)
- [4.13 "Safe Handling of Engineered Nanomaterials"](#)
- [6.2 "Laser Safety"](#)
- [6.3 "Electric and Magnetic Fields"](#)
- [7.4 "Confined Space Entry"](#)
- [7.6 "Noise Control and Hearing Conservation"](#)
- [7.11 "Ventilation and Air Cleaning"](#)
- [10.14 "Use and In-place Testing of HEPA Filters"](#)
- [12.2 "Personal Protective Equipment"](#)

**Division Specific Information – Industrial Hygiene**

See the MSD Chemical Hygiene Plan for details.

**APPENDIX E BIOLOGICAL SAFETY**

The Argonne biosafety program is defined by [ESH Manual Chapter 4.9](#). Biosafety policy and biohazard risk assessment are carried out as mandated by 10 CFR 851, as well as all other applicable federal and state regulations, by the Argonne [Institutional Biosafety Committee](#) (IBC). The charter of the committee can be viewed at <http://www.biosafety.anl.gov/>. The IBC has an NIH-OBA-approved membership roster (as required by the *NIH Guidelines For Research Involving Recombinant DNA Molecules [NIH Guidelines]*), which has the professional background and training to carry out the review of rDNA work and overall biohazard risk assessment for Argonne employees and resident facility users on site.

Biohazardous material is defined as any biological material that can pose a health risk to humans, animals, and/or plants. This definition is broad enough to include potentially

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infectious material (PIM) as defined by OSHA under the Bloodborne Pathogens Standard (29 CFR 1910.1030) such as human blood, tissue, and any material derived from such material that still may pose a risk of infection. Those employees, resident facility users, or nonresident facility users who wish to transport, possess, and/or manipulate material falling within one of these categories must contact one of the two Argonne biosafety officers (site-wide or APS) for a preliminary review of the safety and regulatory issues involved with the proposed work. If the work is deemed to fall within one of the categories of regulated biohazardous material, an application with relevant information attached (such as copies of required permits to transport/possess; operational protocols, etc.) is submitted to the IBC for formal review at the next monthly meeting. In addition to experts in microbiology and virology, the Committee roster includes members of the Argonne Occupational Medicine and Legal Departments, as well as members who are familiar with such issues as DOT shipping regulations. Issues such as required training and medical monitoring are discussed, as well as the potential for aerosol formation and dissemination of the material. The review covers both engineering as well as operational controls from the viewpoint of both hazard minimization and maintenance of control over the hazardous material.

Argonne has two biosafety officers, site-wide and at the APS, who ensure that IBC-determined biosafety policies are carried out appropriately. Mechanisms for regulatory compliance evaluation include annual BSL2 and BSL3 facility inspections, agent-specific training, and maintenance of an etiologic agents inventory, as well as frequent interaction with medical department, division, and APS sector safety employees and emergency response personnel.

**Division Specific Information – Biological Safety**

The division does not currently carry out any BSL2 or BSL3 work. BSL1 programs are monitored through the project safety review process to ensure that higher biosafety levels are not reached.

**APPENDIX F OCCUPATIONAL MEDICINE**

Argonne's occupational medicine program has elements contained in several locations. The drivers for much of the medical surveillance program portion are contained in the applicable OSHA regulations. The overall Occupational Medicine program is driven by [ESH Manual Chapter 3.1](#). The Medical Department has a tier 3 set of requirements that is contained in the Medical Department Policy and Procedures, which are maintained and updated by the medical director.

**Division Specific Information – Occupational Medicine**

The division relies on Argonne's Occupational Medicine program described above.

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**APPENDIX G MOTOR VEHICLE SAFETY**

Argonne's motor vehicle safety requirements are contained in [ESH Manual Chapter 15](#).

**Division Specific Information – Motor Vehicle Safety**

There is no division-specific information on motor vehicle safety.

**APPENDIX H ELECTRICAL SAFETY**

Argonne's electrical safety program is contained in *ESH Manual* Chapters 9.1 to 9.5, with some elements incorporated into individual sections throughout the *ESH Manual* as applicable. Argonne maintains an [Electrical Safety Committee](#) with membership from operations, oversight, and programmatic groups. Argonne has an authority having jurisdiction (AHJ) position for electrical safety as agreed and approved by DOE with responsibility for rulings and documentation of judgments made within the confines of the applicable codes and standards allowing rulings and decisions by an AHJ for electrical issues.

The *ESH Manual* chapters can be viewed at:

[9.1 "General Electrical Safety"](#)

[9.2 "Electrical Worker Safety"](#)

[9.3 "Electrical Systems and Equipment"](#)

[9.4 "Lightning Protection"](#)

[9.5 "Batteries"](#)

*Related electrical safety information:*

[Electrical Safety Committee](#) (including charter, current membership, meeting agendas minutes)

[General electrical safety information](#) including recent safety alerts, Argonne and key lessons-learned, and electrical safety implementation memos, and other resources

[Detailed information and resources associated with Argonne's unlisted electrical equipment inspection program](#) (outlined in [ESH Manual Section 9.3.3](#))

**Division Specific Information – Electrical Safety**

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**APPENDIX I NANOSCALE MATERIALS (RESERVED)**

While this section is currently reserved, Argonne is using a program for safe handling of nanomaterials. The program is past initial development, but is being developed and refined as information is obtained regarding the behavior of the materials and protective measures necessary for the safety of employees, the public, and the environment. Requirements for safe handling of engineered nanomaterials can be found in *ESH Manual* [Chapter 4.13](#).

**Division Specific Information – Nanoscale Materials**

The MSD project safety review includes nanoscale materials as a potential hazard. Nanoscale materials are treated as an unknown health hazard, and hazard controls similar to those for chemicals of unknown health hazard are prescribed: minimization of exposure, avoidance of dispersion in air, PPE, and respiratory protection are some of the possible mitigations prescribed by the project safety review.

**APPENDIX J WORKPLACE VIOLENCE PROTECTION (RESERVED)**

While this section is reserved at this time, Argonne *Human Resources Policy and Procedures Manual* [Policy 7425.1](#) and [Procedure 7425.2](#) outlines what types of behavior are defined as violence and the policy that an employee demonstrating workplace violence is subject to disciplinary action.

**Division Specific Information – Workplace Violence Protection**

There is no division-specific information on workplace violence protection.

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### Attachment 1 WORKSITE LOCATIONS

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#### ATTACHMENT 1

#### WORKSITE LOCATIONS

10 CFR 851.3 defines a covered workplace as "...a place at a DOE site where a contractor is responsible for performing work in furtherance of a DOE mission."

Argonne National Laboratory, located at 9700 S. Cass Ave., Lemont IL 60439, is the principal site for operations that are covered by this rule. There are approximately 3500 full time employees at this location.

Argonne has a satellite office, which is not covered by this Rule, located at 1200 Internationale Parkway, Woodridge IL 60517.

Argonne maintains agreements and leases at several small sites throughout Kansas, Nebraska, and Oklahoma in support of atmospheric and agricultural programs. These sites do not meet the DOE criteria of a DOE site, due to either the lack of control by DOE, or health and safety being regulated by OSHA. The latter applies in particular to a warehouse located in Lincoln, Nebraska.

Argonne maintains field offices in Denver, Colorado, and the Washington, D.C., area. Both of these locations are subject to OSHA regulation.

Argonne currently has employees stationed at the following DOE sites and following the site WSHP: Oak Ridge National Laboratory, Idaho National Laboratory, Jefferson Laboratory, DOE Forrestal, DOE Office of Policy Planning.

Argonne has employees who are stationed at and assigned to military installations or bases. These employees are covered by the site DOD safety regulations. One employee is stationed at Pine Bluff Arsenal.

Argonne has two employees stationed at CERN, one employee stationed at DESY, and one in AOARD. All three of these sites are out of the country. CERN is in both France and Switzerland with French, Swiss, and EU safety oversight). DESY is located in Hamburg, Germany, and operates under German and EU safety oversight, and AOARD is in Japan, and operates under the Japan International Center for Occupational Safety and Health (JICOSH).

#### **Division Specific Information – Worksite Locations**

MSD does not have any employees assigned to off-site locations. However, several principal investigators have joint appointments with area universities, such as

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**Attachment 1 WORKSITE LOCATIONS**

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Northwestern University, University of Illinois-Chicago, Northern Illinois University, among others, where they may work on projects related to their work at Argonne.

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**Attachment 2 CLOSURE FACILITY IDENTIFICATION, HAZARDS, AND CONTROLS**

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**ATTACHMENT 2**

**CLOSURE FACILITY IDENTIFICATION, HAZARDS, AND CONTROLS**

Argonne has one (1) closure facility at this time. Building 301 demolition is ongoing. Hazards have been assessed and will continue to be assessed during the demolition. The fixed industrial ladders in the facility are not compliant to the ANSI standard or to the OSHA regulations. These ladders will not be used and will be taken out of service. This action will mitigate the hazards associated with the noncompliant design of the ladders.

### **ATTACHMENT 3 CURRENT VARIANCES AND EQUIVALENCIES**

Argonne has one formal variance and two equivalencies granted prior to the promulgation of 10 CFR 851.

1. Variance to 5480.1A, 420.1A, 420.1B. The purpose was to construct the Advanced Photon Source (APS) without fire walls segregating value. This also included an allowance for the use of “duck unders” for means of egress.
2. Equivalence to Life Safety Code, NFPA 101, for Building 331 shell (former reactor containment building) to enable occupancy with one enclosed stair, one open stair and a limitation on occupancy below the ground floor.
3. Equivalence to Life Safety Code, NFPA 101, for Building 201, to enable continued use with noncode compliant exit capacity. Equivalency documented and validated via the ESES – Fire Safety Equivalency System.