LBNL
Engineering Division (EG)

Integrated Safety Management Plan (ISM)

Original: May, 1998
Revision Change Log

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Introduction and Overview

Mission of the Engineering Division
The Mission of the Engineering Division (EG) is to design, build, and maintain the next generation of scientific instrumentation of all scales that will advance scientific discovery, the strategic priorities of LBNL, and the mission of the USDOE/Office of Science.

Management Philosophy and the Division ISM Plan
Working safely is simply a part of how we do our jobs. Safe working practices are integrated into how we successfully execute and achieve program/project objectives; safety is not simply a goal or an end in and of itself. This means that employees in every job never view safe planning and practice as an add-on or as a strict compliance activity.

From the Engineering perspective, “a plan” is similar to a road map drawn to arrive at a specific destination. In other words, a plan achieves a specific objective.

Therefore, the EG ISM Plan is designed to achieve three simple objectives: (1) explain why ISM matters; (2) explain what ISM is – (i.e. the structure and five core functions of
ISM); and (3) describe how to apply ISM.

**Changing the EG ISM Plan**
Safety coordinators and management review the plan (at least) annually to assure the accuracy, utility, and simplicity of the plan. Review dates are noted on the cover page only when substantive changes have been introduced.

Employees at all levels are encouraged to submit suggestions to their supervisors that will improve the simplicity and utility of the EG ISM Plan.

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**Why Does ISM Matter?**

The U.S. Department of Energy requires all their contractors to apply Integrated Safety Management [ISM] as a part of how work is accomplished {LBNL is a DOE Contractor managed by the University of California}. [DOE Policy Directive 450.4 – Safety Management System Policy; approved 09/29/2011; https://www.directives.doe.gov/directives/0450.4-APolicy-a/view]

As a performance expectation, LBNL line management is directly responsible for the protection of the public, the workers, and the environment. [DOE ISM Implementation Manual 450.4-1; approved 09/29/2011; Attachment 2; https://www.directives.doe.gov/directives/0450.4-EGuide-1c/view].

ISM is one tool to guide and improve how any task or job is performed at LBNL.

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**What is Integrated Safety Management [ISM]?**

**What is ISM? - A way to perform any job safely**

ISM is Integrated Safety Management … it is the roadmap designed to guide employees in the performance of their duties.

Integrated – safety is not a goal … it is simply a part of how any job is done

Safety – performing a job in a manner that will protect the health and safety of people [employees, the public, etc] and the environment [ecology, etc]

Management – choices made and actions taken by employees and line managers that will achieve goals and objectives in the most efficient and effective manner
How do I apply ISM to my job?

- Begin with five simple questions [at your discretion … develop more of your own!]
- Understand the answers before starting a new job, performing a new or unusual task, or improving routine work.

EXAMPLES OF QUESTIONS TO ASK and ANSWER [based on the Five ISM Core Functions]:

**BEFORE WORK STARTS**
1. Define the work – know the “who, what, when, where, and how” integral in any task/job/assignment.
2. Do I/my staff members know what the hazards, risks, and impacts are?
3. Do I/my staff members have everything needed to do the job safely: training, tools, skills, time, a formal or informal work plan, formal or informal hazard controls, and work authorizations?

**WHILE YOU ARE WORKING**
4. Am I/my staff members doing the job safely and as planned? Re-evaluate when things do not go as planned.

**AFTER THE JOB IS DONE**
5. What can I do to improve the job next time? What went well and how can we apply this to other work?

Additional Resources for Employees and Supervisors

Employee Responsibilities

[Reference. DOE G 450.4-1C; Attachment 2; 09/29/2011
https://www.directives.doe.gov/directives/0450.4-EGuide-1c/view ]

Every individual accepts responsibility for incorporating safe work practices into
how he/she does their job. Individuals demonstrate a questioning attitude by challenging assumptions, investigating anomalies, and considering potential adverse consequences of planned actions. All employees are mindful of work conditions that affect safe performance, and assist each other in preventing unsafe acts or behaviors.

- Every 12 months, all EG employees complete ISM 101 Online to understand how ISM can apply to any task, job, or objective.
- Workers take active involvement in identification, planning, and improvement of work and safe work practices.
- Employees at any level stop unsafe work or work subject to unexpected conditions.
- Workers promptly report accidents and incidents to their supervisor.
- Workers cultivate a constructive, questioning attitude and healthy skepticism when it comes to safe performance. Individuals are aware of and counteract human tendencies to simplify assumptions, expectations, and analysis of performing any job safely (especially applicable to non-routine, one-off, anomalous tasks).
- Workers understand that safety is not a goal - it is how we do our job: safely, competently, effectively and creatively.

**Supervisor Responsibilities**

[Source: DOE M 450.4-1; Attachment 2; 09/29/2011
https://www.directives.doe.gov/directives/0450.4-EGuide-1c/view ]

Line management takes direct responsibility for the protection of the public, the workers, and the environment. Line managers set expectations that incorporate safe working practices into all other work practices.

- Supervisors, through the Division, allocate resources to address safety, programmatic, and operational considerations.
- Supervisors have a clear understanding of the work activities of their staff, and how their staff will safely conduct their work activities and accomplish their performance objectives.
- Supervisors periodically take steps to recognize safe performance and behavior, including personal visits and walkthroughs to verify that performance expectations are being met.
• Supervisors spend time on the floor and exercise management discretion by coaching, mentoring, and reinforcing expectations and positive behaviors. Performance falling short of expectations is promptly addressed, and when appropriate, analyzed to improve future performance.

• Supervisors do not discipline employees for the reporting of errors, incidents, or accidents. They encourage a vigorous questioning attitude toward safety, and constructive dialogues and discussions on safety performance. Line managers recognize prompt accident and incident reporting as a desired behavior and regard prompt reporting as performance expectation that will help protect workers, the public, and the environment.

• Supervisors use reasonable management discretion to assess the use and effectiveness of the ISM by employees [see the section “Evidence of ISM” below]

• Where applicable, Supervisors collaborate with the Division Safety Coordinator to track Corrective Action Tracking System (CATS) entries to a timely conclusion

### Deputy Division Directors Responsibilities

• In addition to the above responsibilities, use reasonable management discretion to assess the use and effectiveness of the ISM by supervisors [see the section “Evidence of ISM” below].

• Collaborate with peers and staff to help complete the annual EG EH&S Self Assessment {sponsored by LBNL/Office of Contract Assurance}

• Identify opportunities to improve performance within their management lines.

• Integrate your responsibilities across Divisional boundaries

### Division Director Responsibilities

• Lead and advance the safety culture across LBNL and within the Division
• Provide a set of expectations for Division management
• Secure the necessary resources to achieve these expectations

### Evidence of ISM

Line managers and employees may practice one or more of the following performance expectations as “evidence” of ISM.

a. Consistently performs new Hazard analysis for new scope
b. Reassess prior hazard analysis to improve how existing scope is performed

c. Holds informal or formal discussions and/or safety meetings to review how work was accomplished and to explore ways to improve quality outcomes

d. Conducts formal and/or informal walkarounds. Makes observations of work practices and/or physical infrastructure in order to keep employees safe

e. Reviews and discuses walkaround results with peers, direct reports and/or managers to improve performance

f. Conducts meetings to review incidents, accidents, and lessons learned in order to increase awareness, protect employees and improve performance

g. Reviews and keeps JHA’s current (within 12 months) for employees and guests

h. Reviews and keeps Required Training current or scheduled prior to the expiration date

i. Engages subject matter experts and the supervisor before starting an unusual “one-off” or anomalous tasks

j. Schedules routine ergo assessments and evaluations to mitigate risk of discomfort or injury. Uses graded approach to identify positions, tasks, or individuals at risk. Follows up and complete remediation in a timely fashion

k. Where applicable, verifies and maintains a chemical inventory [http://eetd.lbl.gov/EHS/chem-waste/chem-inv-ref.html] that is both current and accurate.

l. Where applicable, verifies and maintains compliance in all Satellite Accumulation Areas (SAAs) and Waste Accumulation Areas (WAAs) relative to LBNL Waste Management safety policy and procedure [http://www.lbl.gov/ehs/pub3000/CH20.html]

m. Implements the required or reasonable safety controls when performing a task.

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**EG Walkaround Guide**

Walkarounds represent **one approach** that can help protect workers, the public, and the environment. When thoughtfully considered and carefully planned, a walkaround can be used to assess the complete approach to how work is done relative to the overall organizational mission or a specific program or project objective (efficiency, effectiveness of safe work practices, planned quality vs. actual quality, coordination, interdependence, communications, etc).
An effective walkaround includes comprehensive observations of behaviors, processes, controls, systems, and practices; as well as the physical space and equipment as applicable. Walkarounds are performed as often as necessary to protect the health and safety of the employees and the environment. The frequency and purpose of the walkaround is determined by each supervisor.

Supervisors are responsible for formulating their own walkaround plans and schedules and discussing these plans, reviews, and results with their respective supervisor and direct reports. Supervisors are encouraged to document their observations in the Engineering walkaround database (or elsewhere) and to share walkaround observations and findings with their peers during safety meetings to increase knowledge and promote improvement.

Division Deputies and Supervisors may employ a variety of means to plan and execute walkarounds and document results including eRoom, the Laboratory calendar system, Wiki Internet resources, Google Documents, checklists available on the EH&S web site, and documented and filed “hard” copies.

See Engineering Division’s “Walkaround Training and Checklist” found here https://engineering.lbl.gov/emp/esh.html for help on how to do a walkaround.

Any employee, supervisor, manager, Department Head, or Division Deputy, may call upon the EG safety coordinators for review and assistance at any time.

### Matrixed Personnel and Work Leads

Engineering is a “matrix” division – the majority of our employees work on projects or programs of other divisions. Guidelines is found here in PUB3000, note section 1.4.2.3: http://www.lbl.gov/ehs/pub3000/CH01/CH01.html#sec14

A Work Lead is anyone who directs, trains, and/or oversees the Work and activities of one or more Workers. Work Leads provide instruction on working safely and the precautions necessary to use equipment and facilities safely and effectively. A **Worker’s default Work Lead is his/her Supervisor**, but the Supervisor may designate another person to be the Work Lead. Work Leads authorize Work with the concurrence of the Worker’s Supervisor. Additional information on the roles and responsibilities specific to a Work Lead is found here: http://www.lbl.gov/ehs/pub3000/CH32.html#sec3263.

Employees and supervisors are expected to employ the ISM and review the JHA when any assignment changes.

The Engineering line supervisor retains responsibility for completing the Supervisor’s Accident Analysis Report (SAAR) [http://www.lbl.gov/ehs/pub3000/CH05_1.html] in all cases.
It is essential, especially in a matrix environment that the home and host supervisor share in the assessment and development of safe work practices. Cooperation and collaboration is essential to achieve any shared objective.

**Safety of Off-Site Workers**

The Engineering Division recognizes that ISM applies to all LBNL personnel, working anywhere, anytime (including Lab-sponsored travel).

For work at the UC Berkeley campus, there is a UCB/LBNL Partnership Agreement concerning EH&S policies and procedures governing accountability and authority for safe practice. Line supervisors retain accountability to assure the LBNL workscope executed on the campus is performed safely and in accordance with local standards.

Home and host supervisors take all appropriate action to assure their direct reports are working safely at all other off-site locations, including formal telecommuting arrangements. See RPM Chapter 2 for more information [http://www.lbl.gov/Workplace/Policy-Memos/proposed/R2.23D.html](http://www.lbl.gov/Workplace/Policy-Memos/proposed/R2.23D.html).

**Safety of Students & Affiliates**

ISM does not distinguish between students/affiliates and any other type of personnel performing LBNL workscope. As employees, affiliates, or students, the contract between DOE and UC directs LBNL to assure safety in all operations “regardless of the performer of the work.” When it comes to safe work practice, Students and affiliates are afforded the same protections and assume the same responsibilities as any other LBNL employee.

Before work begins, engineering line supervisors are responsible to work with the student/affiliate to assure a thorough understanding of safe practice. The line supervisor assures the student/affiliate completes a JHA, EHS010, and performs work within the requirements described in the RPM and PUB3000.

**ISM Resources**

The [EG Safety Coordinator](http://www.lbl.gov/ehs/pub3000/CH06.html). The coordinator can help you:

- Define the work; identify and analyze hazards and risks; design and implement controls.
- Assist managers and PI's in the creation of formal safety authorizations. [http://www.lbl.gov/ehs/pub3000/CH06.html](http://www.lbl.gov/ehs/pub3000/CH06.html).
- Audit and improve the JHA.
• Identify and resolve safety-training needs.

• Assist in fact finding reviews and root cause analysis after an incident, near miss, or injury.

• Help supervisors apply and assess ISM in their management lines.

**Engineering Human Resources** is available to both line supervisors and EG staff members to develop strategies intended to improve job performance. A division manager or line supervisor may consult with EG HR to develop and implement appropriate, specific, measurable and effective performance expectations.

**EG EH&S Safety Liaison** is the individual with professional safety expertise assigned from EH&S to support Engineering as a technical resource. Upon request, the EH&S Liaison provides professional expertise and safety-related guidance and direction to employees, line supervisors, the Division Safety Coordinator, and Division Management. Working through the EG Safety Coordinator, the EG EH&S Liaison helps Line Supervisors assure that ISM is consistently and effectively implemented.

**EG ISM Wallet or Necklace Badge.** The Engineering Division has designed and distributed the EG ISM Badge. A review of the ISM Checklist – especially before “one-off” or non-routine tasks - can help employees perform their jobs in a safe manner.

**EG Online Course “ISM 101”.** The Engineering Division has also designed an online course “ISM 101”. The purpose of the course is to describe actual work-related
situations and explain what ISM is, and how ISM is applied when performing any job
https://engineering.lbl.gov/depts/ops/groups/esh/training-online.html

SUMMARY OF ISM – 7 Guiding Principles and 5 Core Functions Source:
https://www.directives.doe.gov/directives/0450.4-APolicy-a/view

1. Line Management Responsibility for Safety. Line management is directly responsible for the protection of the public, the workers, and the environment.

2. Clear Roles and Responsibilities. Clear and unambiguous lines of authority and responsibility for ensuring safety shall be established and maintained at all organizational levels within the Division.

3. Competence Commensurate with Responsibilities. Personnel shall possess the experience, knowledge, skills, and abilities that are necessary to discharge their responsibilities.

4. Balanced Priorities. Resources shall be effectively allocated to address safety, programmatic, and operational considerations. Protecting the public, the workers, and the environment shall be a priority whenever activities are planned and performed.

5. Identification of Safety Standards and Requirements. Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.

6. Hazard Controls Tailored to Work Being Performed. Administrative and engineering controls to prevent and mitigate hazards shall be tailored to the work being performed and changing work conditions.

7. Operations Authorization. The conditions and requirements to be satisfied for operations to be initiated and conducted shall be clearly established and agreed-upon.

Five ISM Core Functions
1. Define the Scope of Work. Missions are translated into work, expectations are set, tasks are identified and prioritized, and resources are allocated.

2. Analyze the Hazards. Hazards associated with the work are identified, analyzed and categorized.

3. Develop and Implement Hazard Controls. Applicable standards and requirements are identified and agreed-upon, controls to prevent/mitigate hazards are identified, the safety envelope is established, and controls are implemented.
4. **Perform Work within Controls.** Readiness is confirmed and defined work is performed safely.

5. **Provide Feedback and Continuous Improvement.** Feedback information on the adequacy of controls is gathered, opportunities for improving the definition and planning of work are identified and implemented.

Live Link to EG Org Chart

[http://engineering.lbl.gov/about/org.html](http://engineering.lbl.gov/about/org.html)
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<td>Master Emergency Program Plan 2.3.6.4 - Building Managers facilitate and coordinate the response of the Building Emergency Team, assist professional responders as necessary, and communicate with the Emergency Operations Center (EOC). <a href="http://www.lbl.gov/ehs/pub3000/CH09.html">http://www.lbl.gov/ehs/pub3000/CH09.html</a></td>
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