

**U.S. DEPARTMENT OF ENERGY (DOE)
OFFICE OF SCIENCE (SC), FERMI SITE OFFICE**

**OPERATIONAL AWARENESS PROGRAM
AT THE
FERMI NATIONAL ACCELERATOR LABORATORY**

REVISION 2

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1.0 INTRODUCTION

The DOE Fermi Site Office (FSO) Operational Awareness Program was developed to meet the requirements of DOE Policy 450.5, *Key Elements of Line Oversight of Environment, Safety, and Health*. This document describes the scope of operational awareness activities implemented by FSO at Fermi National Accelerator Laboratory (Fermilab) to assess the systematic integration of ES&H into management and work practices at all levels consistent with DOE Policy 450.4, *Safety Management Systems*

Operational Awareness is defined as the aggregate of interactions between FSO and Fermilab on the management and operation of facilities, projects, and programs. Operational Awareness activities include communication of expectations, surveillance of work planning and execution and monitoring of specific programs, projects, and operations. Operational awareness is intended to provide FSO management with an assessment of the processes used by Fermilab to manage activities on the Fermilab site. Implementation of an integrated approach to operational awareness will help determine if Fermilab is operated in a safe and environmentally-sound manner consistent with the requirements of the contract with Universities Research Association, Inc. (URA).

The FSO operational awareness program specifies the roles and responsibilities of FSO personnel in the operational awareness program, describes the assignment of FSO technical resources for operational awareness activities, and outlines the process for identifying issues that need to be addressed through self assessment. FSO Operational Awareness roles and responsibilities are also included in the *FSO Functions, Responsibilities, and Authorities Manual* (FRAM) as well as the *FSO Standard Operating Procedures* and staff position descriptions and performance plans.

2.0 FERMILAB OPERATIONS

Fermilab does high-energy physics research. This type of research requires highly sophisticated tools, facilities and operations. Research support activities include maintaining and operating site utilities and infrastructure, construction, environmental remediation/restoration and waste management. Collectively, these tools, facilities, operations and research support activities present diverse potential hazards to Laboratory workers and researchers.

Fermilab is responsible for identifying, analyzing and mitigating potential hazards to the public, workers, users and the environment. When subcontractors are utilized to do work on site, the subcontractors are bound by contract to utilize the framework of Integrated Safety Management (ISM) in both the planning and execution of work. The DOE expectation is that all research and support activities will be performed safely and with minimal environmental impact. Fermilab utilizes the Necessary and Sufficient Process to identify the appropriate Work Smart Standards (WSS) for work performed on the Fermilab site.

Work at Fermilab is performed under the terms of a performance-based management and operating contract that is administered by the FSO Contracting Officer with the assistance of FSO staff. FSO represents the government's interest in all interactions with Fermilab. FSO

personnel responsible for operational awareness must be able to assess how effectively Fermilab is implementing ISM and other contractual ES&H requirements in the performance of work. Consequently, FSO personnel must maintain an awareness of Laboratory programs, operations, activities, and management systems including contracting and administration of contracts. Achieving this broad awareness necessitates on-going interaction with management, support and technical staff at all levels.

Operational Awareness is accomplished through observation of the extent to which ISM is incorporated into work activities and support documentation in the following areas:

- Laboratory management processes;
- Work planning, training, and implementation;
- Accelerator and detector operations;
- Facility and infrastructure maintenance, construction, and support services; and
- Laboratory performance against contractual performance measures.

3.0 PROGRAM GOALS

The FSO Operational Awareness Program includes a number of very specific goals. These goals include the following:

3.1 Promote Open Communications with Fermilab:

- Communicate DOE performance expectations to Fermilab/URA both verbally and in writing.
- Encourage two-way dialog and collaboration between DOE and Fermilab employees.
- Discuss current, emerging, or potential operational concerns or issues at earliest opportunity.

3.2 Maintain Awareness of Fermilab Activities:

- Monitor implementation of Fermilab ISM Program in work planning and execution.
- Observe selected activities to gather information on ISM Program implementation.
- Review and evaluate selected ES&H programs to assess quality of programmatic activities.
- Monitor relevant records and databases to search for issues or trends in performance.
- Review Fermilab assessments to evaluate effectiveness of program and provide feedback.

3.3 Effectively Communicate Concerns and Monitor Correction:

- Inform appropriate Fermilab management of significant concerns or issues.
- Inform FSO management of any significant occurrences or events.
- Track the reporting of concerns and corrective actions to completion.
- Monitor and evaluate the effectiveness of corrective actions.
- Evaluate the lessons learned implications to other DOE sites.

4.0 ROLES AND RESPONSIBILITIES

Implementing the FSO Operational Awareness Program necessitates the commitment of staff resources for monitoring contractor operations. The number of FSO staff assigned and the time allocated to perform operational awareness activities may vary over time based on the quality of the Fermilab safety program, new or continuing DOE safety initiatives, the level of research activity, and the number of new projects/construction activities on site. As program needs change, FSO management will assess available staffing and resources mix and adjust accordingly. Subject matter experts from external sources are brought in to support program activities on an as needed basis.

A generalized version of the FSO Organizational Chart is shown in Attachment 1 at the end of this document. Each FSO manager and staff member has specific roles and responsibilities in the Operational Awareness Program. Roles and responsibilities of FSO Management, Facility Representatives, ES&H Specialists, Project Directors, and Business/Administrative Specialists are provided in Attachment 2.

4.1 FSO Management

The FSO Manager and Deputy Manager provide overall leadership for the Operational Awareness Program and directly participate in Operational Awareness activities. Their participation allows them to obtain current information on activities occurring on the site and set program expectations through direct observation of program implementation. This direct involvement also promotes open communication with Fermilab, maintains an awareness of Fermilab activities and facilitates open communication and effective resolution of concerns.

Operational Awareness activities are utilized to support an awareness of research direction, assess the effectiveness of Fermilab management systems and evaluate the allocation of laboratory resources. Program activities are also used to assess the effectiveness of the Fermilab integrated safety management system (e.g., using approaches such as those suggested by the *Chicago Operations Office (CH) Program for Maintaining and Improving Integrated Safety Management (ISM) at CH Laboratory Sites* (CH O 450.4)). FSO personnel assist the Manager and Deputy Manager in implementing a rigorous operational awareness process.

4.2 Facility Representatives

FSO Facility Representatives (FRs) maintain awareness of operations in assigned facilities and monitor selected operations and construction activities consistent with the *"FSO Facility Representative Program."* An FR is expected to spend a majority of their time performing operational awareness activities consistent with DOE STD 1063. This standard was designed to "provide flexibility to field elements in how they choose to use their available resources." To avoid potential conflict, FRs may not be responsible for preparing the budget, work schedule or programmatic direction for assigned facilities.

FRs must observe selected activities and review documentation to assess the adequacy of work planning and determine whether work is being performed within appropriately designed controls. Identified safety and health concerns should be subjected to a causal analysis in order to identify appropriate compensatory measures or solutions. These measures should then be followed to conclusion. An FR monitors reports prepared and entered into incident reporting and tracking systems for his/her assigned areas.

4.3 ES&H Specialists

ES&H Specialists are subject matter experts (SMEs) with training and experience in a variety of environmental, safety and health areas. The SMEs provide the technical resource to evaluate contractor programs for compliance with applicable standards through an on-going knowledge of the Fermilab environmental, safety and health programs and an awareness of developing issues or concerns. The on-going knowledge of the SMEs facilitates better communication with laboratory points-of-contact which in turn supports a process of continuous improvement.

The SMEs also provide a technical resource to FSO management through participation in FSO reviews and through attendance at Fermilab ES&H committees and subcommittees. Involvement in these assessment and oversight activities facilitates the early identification of issues or concerns and effective resolution of the issue or concern. The FSO Manager will on occasion request support from technical resources external to the FSO when additional technical support is needed.

4.4 Project Directors

FSO Project Directors have responsibility for monitoring Fermilab construction and research program projects. Project Directors also review and approve or recommend approval of project documentation prepared by the contractor and submitted to FSO. The Project Directors monitor progress against established project milestones and monitor budgets to verify that each project meets FSO project objectives. The Project Directors serve as the point-of-contact with the Office of Science on project status.

The Project Directors provide environment, safety and health oversight for their projects and evaluate the adequacy of environment, safety and health program integration for their assigned project from the planning stage through work execution. Project Directors may request technical support from Facility Representatives and ES&H Specialists on environment, safety and health topics, as needed.

4.5 Business/Administrative Specialists

Business/Administrative Specialists with training and experience in contracts, property management, finance and procurement monitor Fermilab compliance with DOE business standards as set forth in the contract for management and operation of Fermilab. The Business/Administrative Specialists monitor the use of acceptable business practices in allocation of the funding provided for activities on the Fermilab site. They coordinate the preparation of contractor performance measures and annual reviews of performance against expectations. The Business/Administrative Specialists serve as the point-of-contact with the Office of Science on business/administrative matters.

The Business/Administrative Specialists also monitor changes in contract scope, control the allocation of funds, and determine whether specific Departmental requirements relating to contract administration are fulfilled. The Business/Administrative Specialists maintains a current list of environment, safety and health requirements in the contract and monitors the inclusion of appropriate environment, safety and health clauses in selected Fermilab subcontracts.

5.0 OPERATIONAL AWARENESS ACTIVITIES

The FSO Operational Awareness Program consists of a broad range of activities that provide a basis for selective monitoring and evaluating contractor operations and performance against expectations. This includes evaluation of work and work control processes to observe the effectiveness of Fermilab implementation of ISM. The list of operational awareness activities includes Surveillances/Walkthroughs, Meeting Attendance, Self-Assessments, Program/Focused Reviews, Readiness Reviews, Incident Reviews and Performance Measures.

Surveillances/Walkthroughs - These oversight activities are often coordinated and conducted jointly with contractor ES&H personnel to reduce redundancy and intrusiveness on workers in the areas. Activities may range from observation of work planning to evaluate hazards identification, mitigation, and controls to the actual observation of work being performed including interactions with contractor personnel. These activities provide an assessment of the effectiveness of the laboratory programs with an emphasis on how standards for the safe performance of work are identified and implemented in the workplace. Surveillances and walkthroughs may be more or less structured and may provide general information on workplace conditions or potential issues requiring further attention.

Meeting Attendance - Attendance or participation in Fermilab management and staff meetings on research direction, management systems, resource allocation, work planning, safety programs or performance measures provides unique access to operational information. These meetings provide an opportunity to gather information on up-coming activities, communicate expectations, and raise concerns. This approach also allows direct observation of the effectiveness of the ISM Program.

Self-Assessments - Fermilab performs self-assessments on an on-going basis to identify weaknesses and potential opportunities for improvements in practices and processes. In the Tripartite Assessments, FSO staff participates directly in the planning and execution of the self-assessments. These assessments are planned well in advance and benefit from information derived from external as well as internal review groups. The effectiveness of the Fermilab self-assessment program and the Tripartite Assessments are reviewed to obtain additional insight into on-going operations and provide feedback to Fermilab when expectations are not being met.

Program/Focused Reviews – Program Reviews are in-depth assessments of the effectiveness of a laboratory-wide program such as the ISM Program to identify program strengths, weaknesses and opportunities for improvement. Focused reviews generally assess specific aspects of a laboratory-wide program rather than the whole program. A focused review may provide an assessment of a particular concern, hazard control, or procedure. Reviews may be proposed, prioritized and selected based on such factors as: specific DOE suggested program review frequencies; observations of possibly isolated system weaknesses which might indicate broader program-wide weaknesses; “for cause” reviews; and functional areas in which SC has highlighted a need for special attention or focus.

Readiness Reviews – Readiness reviews determine whether new or significantly modified operations, activities, or facilities can be operated safely or that facility operations may resume after having been suspended for safety reasons. Readiness reviews may involve review of Safety Assessment Documents (SADs) and any other appropriate safety documentation. Participation may be as an individual reviewer or as a member of an independent review team.

Incident Reviews – An incident may include an accident or injury, environmental release, damage to equipment or structures, or failure of safety systems to perform as intended. An incident review includes an identification of causes, examination of the incident response and development of a corrective action plan to prevent recurrence. An incident review may also be used to assess the effectiveness of Fermilab programs linked to the incident to identify weaknesses in laboratory programs and opportunities for improvement.

Performance Measures - The qualitative review of performance data over extended periods of time may allow for the detection of trends or patterns that could indicate an operational concern. FSO personnel annually develop, negotiate, and then update contract performance measures and metrics for the DOE contract with URA/Fermilab. FSO then evaluates Fermilab performance against these measures. Data sources for such an analysis may include self assessment reports, incident reports, program review results and surveillance/walkthrough results. Potential trends or patterns may then be the basis for follow-up actions.

6.0 PROGRAM INFRASTRUCTURE

The FSO organizational infrastructure is designed to support implementation of the Operational Awareness Program. The supporting infrastructure includes policies, program documents, procedures, guides, and information management systems. The infrastructure is important for communicating management directions and expectations and for ensuring accountability for personnel involved. The supporting infrastructure includes the following documents:

DOE/Universities Research Association, Inc. (URA) Contract – The DOE has a performance-based contract with URA for the safe, effective, and efficient operation of Fermilab.

FSO Annual Plan – The purpose of this Plan is to:

- Serve as the primary FSO document that articulates what FSO will do in the current FY to address corporate priorities and manage the Fermilab prime contract with DOE's contractor (i.e., URA). As such, it (1) communicates FSO contributions to the DOE mission and (2) establishes current FY performance commitments that support DOE strategic priorities and FSO priorities.
- Serve as the basis for flow-down of individual performance expectations.
- Address FSO resource requirements for the current FY.

FSO ES&H Functions, Responsibilities and Authorities Manual (FRAM) – The FRAM is the implementing document for the authorities, functions, and responsibilities assigned to the Manager of FSO and establishes safety management functions and defines lines of authority for FSO managers and staff for planning, performing, assessing, improving, and implementing the requirements necessary to work safely at the Fermilab site.

FSO Standard Operating Procedures (SOPs) – FSO SOPs provide a formal, structured approach for implementing DOE requirements and FSO policies and programs. SOPs are prepared, approved and maintained in accordance with specified requirements.

Individual/Personal Performance Plans – Every FSO employee has a documented performance plan based on work assignments and responsibilities. The plan is results-based and tied to organizational objectives and DOE core values.

Database Systems – Manual and electronic database systems are utilized to track information from this Program and from external sources. These systems provide feedback that can be utilized toward improving ways to screen, track, and trend data. The data may then assist in identifying programmatic or system weaknesses lab-wide. Database information is shared with Fermilab, as appropriate.

7.0 CONTINUOUS PROGRAM IMPROVEMENT

Self-assessment of performance against program goals provides for an analysis of overall program effectiveness and can help identify weaknesses, strengths, and potential improvement opportunities. The FSO Operational Awareness Program is under continuous review to determine those actions to be taken to improve the overall program. The self assessment of this program is performed by those responsible for implementing the program. The review results are presented to FSO management and staff for information, discussion, and action with the goal of continual improvement.

The following topics may be addressed in the program self-assessment:

Effectiveness of program elements including procedures and databases;

Effectiveness of activities in identifying, correcting or preventing concerns;

Contractor response to issues identified and corrective actions taken; and

Effectiveness of communications within FSO, with the contractor, and within DOE.

Ultimately, the most important element in establishing the overall effectiveness of the FSO Operational Awareness Program is communication. Outcomes of the various Operational Awareness activities must be communicated to all involved parties including FSO Management and staff, DOE management and staff external to FSO, and the contractor. This communication is necessary for further discussion and effective corrective action.

8.0 REFERENCES

- 8.1 *Fermi Site Office Functions, Responsibilities and Authorities Manual*
- 8.2 DOE Policy 450.5, *Line Environment, Safety and Health Oversight*
- 8.3 DOE Policy 450.4, *Safety Management System Policy*
- 8.4 CH Order 450.4, *Chicago Operations Office (CH) Program for Maintaining and Improving Integrated Safety Management at CH Laboratory Sites*
- 8.5 DOE-STD-1063, *Establishing and Maintaining a Facility Representative Program at DOE Facilities*
- 8.6 Fermi Site Office Standard Operating Procedures
 - FSO SOP 2.2, *Operations Authorization*
 - FSO SOP 2.3, *Conducting Laboratory Program Reviews*
 - FSO SOP 2.4, *Review and Revision of Laboratory Contractual Performance Measures*
 - FSO SOP 2.7, *Facility Representative Program*
 - FSO SOP 3.3, *Occurrence Reporting and Processing*
 - FSO SOP 3.4, *Oversight of Corrective Action and Lessons Learned*

8.7 DOE M&O Contract DE-AC02-76CH03000 with URA

Attachment 2: Fermi Site Office Roles and Responsibilities

Management, FSO	Facility Representative(s)	FSO ES&H Specialists (with external support, as requested)	Project Directors	Business/Administrative Specialists (Contract/Property/ Financial/Procurement)
Establishes guidance and direction for Program				
Assesses overall risk associated with activities to ensure Program is consistent with risk				
Approves/transmits to Fermilab the FSO Operational Awareness Plan (OA Plan) activities annually	Provide input to OA Plan	Coordinate development of OA Plan annually – recommend to FSO Manager for approval;	Provide input to OA Plan	Provide input to OA Plan
Reviews effectiveness of the Operational Awareness Program; makes appropriate changes	Suggest revisions to this OA Program toward future improvements	Review suggestions and revise this OA Program for future improvements	Suggest revisions to this OA Program toward future improvements	Suggest revisions to this OA Program toward future improvements
		Review contractor activities to determine/confirm ES&H compliance with contractual Work Smart Standards	Review resources committed for ES&H during project planning for adequacy	
Approve proposed changes in scope and content of the contract		Review and recommend approval of proposed changes in scope and content of the contract	Review and recommend approval of proposed changes in scope and content of the contract	Review and recommend approval of proposed changes in scope and content of the contract
		Coordinate with Business/Administrative staff to maintain current list of ES&H requirements in the contract		Maintain a current list of ES&H requirements in the contract
Meet with staff to review information collected through Program activities (including a sense of the	Conduct surveillance to evaluate performance of Contractor implementation of <u>ISM</u> (core functions and	Monitor the effectiveness of contractor implementation <u>ISM</u> (core functions and guiding principles) and of	Meet with contractor to review project status and identify issues that could affect budget, schedule,	Maintain awareness of (and evaluate how effectively) the flowdown of <u>ISM</u> framework and ES&H clauses occur in

effectiveness of <u>ISM</u> implementation)	guiding principles)	ES&H programs in their area(s) of functional responsibility	quality; review status of implementation of framework of <u>ISM</u> by subcontractors (and sub tiers)	subcontracts (and sub tiers)
	Observe operational activities in assigned facilities and support Project Directors in construction safety oversight activities; Verify and assess timely program or corrective action implementation through field observations;	Provide FRs with relevant information requiring their assistance to verify or assess (e.g., questions on program implementation or corrective action completion); Serve as a technical experts to support FRs on functional area issues;	Provide leadership in oversight of construction and maintenance activities while receiving support from FRs and ES&H Specialists, as needed and requested;	
Participates in observation of selected contractor activities in the field	Observe a broad range of work activities and facility work-planning activities; observe work conditions and review documentation to evaluate the status of ISM implementation (including selected construction activities)	Observe and evaluate conditions in various site facilities regarding assigned program responsibilities; assist FRs in review of conditions in various site facilities to address FR questions requiring SME review;	Review project progress in the field to validate status information provided by the contractor; perform oversight of ISM and ES&H status of specified construction work activities;	
Meet regularly with contractor management to discuss issues (may include results from the Program reviews although these will be transmitted formally also)	Participate in meetings with Fermilab managers or staff where planning or operational issues may be discussed;	Set up, as necessary, and attend meetings with contractor counterparts to discuss issues and the effectiveness of programs	Meet regularly with contractor project management staff to review project status and identify issues that could affect budget, schedule, ES&H, and quality;	Meet with the contractor to discuss the status of the contract, including financial expenditures
	Participate in program/system reviews, as assigned;	Conduct program/system reviews; comment on the adequacy of ES&H documents as revised/updated	Participate in program reviews and assessments, as assigned	Participate in program reviews and assessments, as assigned
Evaluate the contractor's annual self-assessment report to DOE	Evaluate the contractor's annual self-assessment report; monitor	Participate in development of contract performance measures; evaluate the	Participate in development of contract performance measures;	Participate in development and monitoring of contract performance measures;

	effectiveness of contractor programs;	contractors annual self-assessment report to DOE;	evaluate the contractors annual self-assessment report to DOE	Evaluate the contractors annual self-assessment report to DOE
Approve safety envelopes and concur in safety assessment documentation or recommend, when applicable	Participate in readiness reviews and assessments, as assigned	Participate in readiness reviews and assessments, as assigned; recommend approval of accelerator safety envelopes and concurrence on SADs	Communicates the need for readiness review activities with the ESH & Program Support Team	
Communicate significant findings/results from the Program to Manager, CH, and to SC; follow up on required corrective actions;	Communicate FR observations, findings, and concerns to contractor (management and lead ES&H staff members) for action; follow-up on actions to ensure they are completed, as appropriate	Communicate observations, findings, and concerns to contractor (management and workers) for discussion, action, as appropriate; follow up to ensure any required actions are completed	Communicate observations, findings, and concerns regarding project status to contractor management for action; follow up to ensure any required actions are completed	Communicate observations, findings, and concerns to contractor (management and workers) for discussion, action, as appropriate; follow up to ensure any required actions are completed
Has <u>stop-work</u> authority	When appropriate, <u>stops work</u> to avoid imminent danger or a major environmental release	When appropriate, <u>stops work</u> to avoid imminent danger or a major environmental release	When appropriate, <u>stops work</u> to avoid imminent danger or a major environmental release	When appropriate, <u>stops work</u> to avoid imminent danger or a major environmental release.
Review/discuss information collected by staff through Program activities	Communicate information on operational activities, emerging ES&H issues, or other items of interest to FSO management	Communicate information on operational or project activities, emerging issues, or other items of interest to FSO management	Communicate information on project activities, emerging issues, or other items of interest to FSO management	Communicate information on financial, contractual, or procurement matters, emerging issues, or other items of interest to FSO management
	Monitor incident related records; maintain awareness of program review results and self-assessments to identify trends and issues; evaluate critiques of incidents; review contractor lessons-learned;	Review contractor critiques of operational events or accidents relating to their program area(s); Monitor incident related records and analyze data on performance to search for trends	Support FSO ESH & Program Support Team by evaluating contractor critiques or investigations of operational events or accidents relating to their projects; be aware of CATS status	Review contractor critiques or investigations of reviews in their area(s) responsibility
	Coordinate review, approval, and closeout of incident reports resulting	Coordinate review, approval, and closeout of incident reports resulting from events	Assist in reviews, approvals, and closeouts of incident reports	Assist in reviews, approvals, and closeout of issues from program reports in their

	from events occurring in their assigned areas/organizations of responsibility	occurring in their assigned program area(s)	resulting from events occurring at their projects	assigned area(s)
Document Operational Awareness activities	Document Operational Awareness activities	Document Operational Awareness activities	Document Operational Awareness activities	Document Operational Awareness activities



Attachment 1
**U.S. DEPARTMENT OF ENERGY
OFFICE OF SCIENCE
FERMI SITE OFFICE (FSO)
(generalized organization chart)**

