

FESHM 2001: ENVIRONMENT, SAFETY & HEALTH FOR PROJECTS

Revision History

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1.0 INTRODUCTION AND SCOPE

All projects at Fermilab are bound by the requirements of the Fermilab Policy Website, the Fermilab Engineering Manual, and this Fermilab ES&H Manual (FESHM) including the Fermilab Radiological Control Manual (FRCM), and the Quality Assurance Manual (QAM). The purpose of this chapter is to provide an overview of major environment, safety, and health requirements that apply to project activities with a total cost of greater than \$10M. Projects include planning and execution of new construction, assembly, renovation, modification, environmental restoration, decontamination and decommissioning, capital equipment, and technology development activities.

Environmental, Safety and Health (ES&H) is a critical component to the success of any program or project. Early integration of ES&H into a program or project ensures that appropriate and adequate processes, personnel, and equipment are in place to meet or exceed expectations. This also provides the means to adequately identify and mitigate potential risks. This chapter describes the expectations regarding the implementation of ES&H in the various types of projects executed by the Fermi Research Alliance (FRA).

New projects with a total cost of greater than \$50M, or at the discretion of the relevant DOE Under Secretary for Projects, with a total cost between \$10-50M (such as new or upgraded High Energy Physics experiments, civil construction, or infrastructure upgrades) are required to follow DOE Order 413.3B – Project and Project Management for the Acquisition of Capital Assets. FRA may choose to undertake focused facility upgrade projects using General Plant Project (GPP) or Accelerator Improvement Project (AIP) funding. FRA also has the option of undertaking less extensive upgrades using Operations budgets. For Projects that fall below the DOE O 413.3B threshold, FRA utilizes a tailored approach as described in the [Fermilab Conduct of Project Management Values and Standards](#).

To ensure there is focus on instituting the appropriate ES&H framework along with other project personnel, it is also expected that 413.3B projects appoint a designated Fermilab ES&H Coordinator for support and guidance on how to integrate ES&H into the project. It is important to note that the Project Manager and Project Director (if one is designated) bear the ultimate responsibility for ES&H in their project. For Projects that fall below the 413.3B threshold, the expectation is that the DSO of the sponsoring division/section will serve as the project's ES&H Coordinator, unless the CSO designates an alternate.

2.0 ACRONYMS

DOE – Department of Energy

DSO – Division Safety Officer

FESHM – Fermilab Environmental, Safety and Health Manual

FRCM – Fermilab Radiation Control Manual

FSO – Fermi Site Office

HA – Hazard Analysis

HAR – Hazard Analysis Report

ISMP – Integrated Safety Management Plan

NEPA – National Environmental Policy Act

PHAR – Preliminary Hazard Analysis Report
QAM – Quality Assurance Manual
SAD – Safety Assessment Document
SVAR – Security Vulnerability Assessment Report

3.0 RESPONSIBILITIES

3.1 ES&H Project Coordinator or ES&H Project Manager

At the discretion of the Chief Safety Officer, an ES&H Project Coordinator may be appointed for designated projects. The Project ESH Coordinator is responsible for:

- Assisting PM with oversight of project activities with respect to ES&H requirements.
- Monitoring project activities to ensure conformance with accepted ES&H standards as delineated separately in FRCM and FESHM.
- When other institutions are within the scope of the Project, coordinate ES&H requirements with local ES&H representatives.
- Promptly reporting to the Project Manager and the Chief Safety Officer significant incidents related to ES&H. The appropriate division or section head should also be notified if the event affects their division or section.
- Attending project-related meetings and discussions and participate in the associated Project Management Group (PMG) meetings, as appropriate.
- Participate in vendor visits as appropriate.
- Being available for internal and DOE reviews as appropriate.

3.2 Project Manager

- Overall responsibility to ensure ES&H implementation on the project
- Maintain cognizance of all project activities
- Approve the PHAR, HAR, ISMP and SVAR, as well as subsequent updates.
- Work with the ES&H Project Coordinator and coordinate ES&H oversight with the ES&H Representatives.

3.3 Level 2, 3, and 4 Managers

- Develop and implement specific ES&H plans, procedures and guides that follow FESHM and FRCM.
- Comply with local ESH requirements for work activities at participating institutions.

4.0 PROCEDURES

An ES&H Plan is required for Projects that are required to follow the DOE O 413.3B, and is recommended for all other project types (e.g. GPP, AIP, etc.). The ES&H Plan for any Fermilab project shall adhere to the Fermilab Environmental Safety and Health Manual (FESHM).

Projects of a wide range of sizes and complexity constitute a major focus of activities at Fermilab. ES&H Project Manager/Coordinators shall work with the Project Management Team to determine the environmental, safety, and health impacts of their projects.

For all projects, consultation with the relevant Division/Section Safety Officer (DSO) or the ES&H Section will be of paramount importance. The appointed ESHPC is expected to assist in such consultations, as noted above in the Responsibilities section.

It is quite common for projects of all scopes and sizes to overlap multiple organizational units, including multiple laboratories. Thus, all relevant organizations must be involved in defining the environment, safety, and health requirements early in the planning process. Projects are required to comply with other laboratory policies in addition to the provisions of this chapter, including those cited as references below. The integration of the requirements of all laboratory policies shall include environment, safety, and health requirements at all stages of project design, and execution, including utilization and operation as well as decontamination and decommissioning. The appointed ESHPC is expected to provide assistance to the projects on these topics.

4.1 Elements of an ES&H Plan

There are several ES&H Plan elements that must be included during the planning phase of 413.3B projects. Generally, projects falling below the 413.3B projects are not required to have a formal, specifically written ISMP, PHAR, SAD or SVAR, unless otherwise deemed necessary by the CSO. Standardized templates for the 413.3B required elements can be found on the [Office of Project Support Services website](#).

The following are elements of an ES&H Plan:

4.1.1. Integrated Safety Management Plan (ISMP)

The fundamental premise of Integrated Safety Management is that accidents are preventable through early and close attention to safety, design, and operation, and with substantial involvement in those that plan and execute the project, based on appropriate standards. Integrated Safety Management is required in all phases of work, beginning at the planning stages of the Project.

4.1.2. Preliminary Hazard Analysis Review (PHAR)

The PHAR constitutes the first stage of environment, safety, and health assessment, and should be written and reviewed before CD2 approval. PHARs refer to applicable FESHM and FRCM chapters as references to accepted Fermilab methodologies for hazard mitigation as appropriate. Projects, as defined in this FESHM Chapter, should create a preliminary hazard analysis report (PHAR) early in the life of the project that is developed further as the project proceeds to a final HAR.

4.1.3. Safety Assessment Document (SAD)

FESHM 2010, Planning and Review of Accelerator Facilities and Operations defines a formal review process to assure that accelerator facilities and their operations comply with Fermilab ES&H standards and with DOE O 420.2C, *Safety of Accelerator Facilities*. This process shall be applied to new accelerator projects or when significant modifications, including decommissioning, occur. The review of a SAD is conducted by the FESHCom Safety Assessment Document Review Subcommittee.

4.1.4. National Environmental Policy Act (NEPA) Review

[FESHM 8060](#) defines the actions needed to receive the appropriate and timely review of potential impacts to the environment, both natural and man-made, as well as human health. NEPA requires federal agencies to consider, and document, the potential environmental impacts of proposed actions prior to initiating those actions. Consequently, the terms of NEPA must be met during the planning phase of a project and/or when substantial project changes are being considered. The NEPA evaluation should begin as soon as there is enough information about the proposed project to engage in meaningful analysis before it is too late to modify the proposed design. This is an important initial step required of all projects.

The project manager or their designee, in consultation with the appropriate ES&H Project Coordinator, is responsible for coordinating NEPA reviews and submitting a [Environmental Review Form](#) to the ES&H Section. The NEPA Program Manager within the ES&H Section compiles NEPA documentation that is submitted to DOE FSO for approval and concurrence on the recommended level of review.

In addition to NEPA requirements, there are many topics in the area of environmental protection that clearly merit early consideration in the planning and execution of projects. [FESHM 8010](#) describes Fermilab's Environmental Management System. Input of environmental ramifications is quite important at an early stage, given the need to meet regulatory requirements which may involve applying for environmental permits. The lead times required to obtain such permits or modifications of existing permits is set by outside regulatory agencies beyond the control of Fermilab or the Department of Energy. Design features needed to meet environmental protection requirements can best be included at optimum cost early in the design.

4.1.5. Security Vulnerability Assessment Report (SVAR)

Prior to CD-1, general safeguards and security requirements must be created and evaluated to meet the project needs. This input becomes part of the conceptual design requirements for further development. Depending on the project scope, members of the Fermilab security team are involved with this process and should be contacted early in the evaluation process.

Prior to CD-2, the SVAR must be updated to account for applicable safeguards and security requirements, evaluating the methods to satisfy those requirements and addresses any potential risk. Risk mitigation must be identified.

Prior to CD-3, the final SVAR should be issued, addressing all the safeguards and security requirements of the project. The project requirements should be satisfied by the facility design and/or the proposed operational features.

4.1.6. Hazard Analysis Report (HAR)

Prior to CD-2, a Hazard Analysis Report is developed by updating the PHAR to include any new or revised information on hazards associated with facility design or the operation. Throughout the project, the hazards and other controls are periodically updated in the HAR.

When applicable, projects will require subcontractors to submit ES&H Plans for review. As with vendor visits, designated ES&H personnel may assist with the review and acceptance of those plans prior to the subcontractor's start of work.

5.0 REFERENCES

[Office of Project Support Services](#)

[DOE O 413.3B](#)