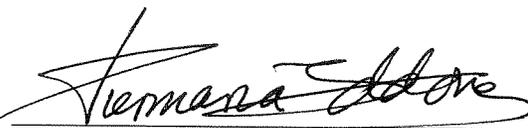


Fermilab Worker Safety and Health Management Plan

Approved By: 
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I. Executive Summary

Title 10 of the Code of Federal Regulations, Part 851 (10 CFR 851), Worker Safety and Health (WSH) Program, requires Department of Energy (DOE) sites to establish a worker protection program that will reduce or prevent the potential for injuries, illnesses, and accidental losses by providing workers with a safe and healthful workplace. This document describes the Worker Safety and Health Program (WSHP) that has been developed at Fermi National Accelerator Laboratory (Fermilab) to comply with 10 CFR 851.

Fermilab is located on approximately 6800 acres of land in Kane and DuPage Counties of Illinois. Fermilab is a single-program national research laboratory managed and operated by the Fermilab Research Alliance, LLC (FRA) for the U.S. Department of Energy (DOE). The Fermilab mission is to provide the resources necessary for qualified researchers to conduct basic research at the frontiers of the field of high-energy physics and related disciplines. Fermilab employs approximately 2000 personnel. There are approximately 200 subcontractors (construction, service, security) working on site throughout the year. Fermilab, being a "user facility" receives more than 3,000 visiting scientists throughout the year as well.

Fermilab carries out its mission in a variety of ways which include:

- A collider program.
- A fixed target program.
- Accelerator research and development programs.
- A science education and literacy program.
- Work for others.
- Environmental and ecological research.

There are five (5) Accelerators working in tandem to accelerate protons to nearly the speed of light. These activities are carried out in well-shielded pits or underground facilities. In addition, there are a number of laboratories and assembly facilities that support the accelerator operations. There are a number of detector halls, including the Collier Detector Facility, D0, MiniBoone, and NuMI.

Fermilab's WSH Program applies to the design, construction, and operation of all the facilities at the Fermilab site. There are no "off-site" or leased facilities to which the program is applicable. Fermilab employees who are assigned to work at locations other than Fermilab are expected to follow the worker safety and health programs established for that site.

This WSH Program description incorporated employee input. The technical subcommittees of the Laboratory Safety Subcommittee participated in the gap analysis. The Program was posted on-line for site-wide review and comment. All comments were addressed. The Program was also sent to the bargaining units for information and input.

II. Principle Components of Fermilab's Worker Safety and Health Program

Fermilab's ES&H program is comprised of the necessary policies, documents, and implementation processes to provide the framework that allows employees, subcontractors, and visiting scientists to conduct their work in a safe manner. The Worker Safety and Health Program description, as required by 10 CFR 851, presents Fermilab's program through a two-pronged approach. The plan centers upon the Laboratory's Integrated Environment, Safety and Health Management (IES&HM) Program and an analysis of the functional programs required by 10 CFR 851. Taken together, these documents describe a robust health and safety program designed to allow employees, visiting scientists, and affected subcontractors to work safely at Fermilab. The WSH Program does not include radiological or environmental hazards associated with DOE activities, as these are not within the scope of 10 CFR 851. However, because of the integrated nature of Fermilab's ES&H program, it is difficult to single out just the safety and health programs. For that reason, references to environment, safety, and health (ES&H) in this document are limited to the protection of workers from workplace safety and health hazards.

Fermilab's WSH program is designed to integrate its IES&H program and the Work Smart Set of Standards (WSS) that have been incorporated into the Management and Operating contract between DOE and FRA. The Fermilab program is founded upon the commitment of Fermilab management and staff to safe operations. This is manifested through the organizational positioning of the ES&H Director as a member of the Directorate, or "key personnel" within FRA, safety discussions at weekly senior staff meetings, the development of cutting edge communication mechanisms such as leading/lagging indicators and the various databases in use, and the use of other Fermilab communication tools (e.g. electronic newsletters) to further safety performance. Further evidence of the implementation of this program can be found in various sections of the Director's Policy Manual, the Fermilab ES&H Manual (FESHM), the ES&H training program, and the databases and guidance information posted on the ES&H website. Many of these initiatives were developed at the grass-roots levels, usually based upon an employee suggestion, identified-need, or opportunity for improvement. Input from employees into the ES&H programs is sacrosanct; it assures a more complete program truly tailored to the hazards and the work to be performed, and promote employee acceptance of requirements and commitment to comply.

The requirements of Fermilab's WSH Program have also been flowed down to subcontractors through the subcontract term and conditions. It is Fermilab's expectations that all subcontractors within the scope of this Rule are incorporated into Fermilab's WSH program. The terms and conditions in the subcontracts include the requirements for Integrated ES&H Management and identifies standards to which the subcontractor is expected to comply. It makes clear the expectation that Fermilab subcontractors are obligated to comply with the Fermilab WSH Program plan. Subcontractors are required to submit appropriate documentation that will demonstrate their commitment to conform with Fermilab's WSH program. That documentation is reviewed to assure the subcontractor's

ES&H program conforms with the Fermilab WSH program. This process is incorporated into Fermilab's implementing documents that relate to subcontractor safety.

Fermilab is host to almost 3,000 scientists and students who take part in the lab's experiments--some 1,800 from 106 institutions in 37 states in the U.S., and over 1,100 from 153 institutions in 31 foreign countries. The scope of the Rule does not include the visiting scientists from other institutions that may work at Fermilab. However, Fermilab does not make this distinction when applying its requirements to visiting scientists. It is the laboratory director's expectation that visiting scientists also participate in the Fermilab ES&H program to the same extent as employees. It should be noted that although the enforcement provisions cited in 10 CFR 851 do not apply to visiting scientists, disciplinary actions, up to and including removal of privileges, are applied to visiting scientists.

The major aspects of Fermilab's WSH program, as defined by this document and its attachments, are:

A. Fermilab Integrated Environment, Safety, & Health Management Plan

- It is the objective of Fermilab management to systematically integrate excellence in environment, safety, and health (ES&H) into the management and work practices of all activities at all levels so that the research mission is achieved while protecting the public, the workers, and the environment. This goal is accomplished by ensuring that the overall management of ES&H functions and activities is an integral part of our overall mission accomplishment.

This Integrated Environment, Safety, and Health Management IESHM Plan (IMP) describes the integration process and references the supporting documents that support the Laboratory's IESHM program. It addresses the following elements of Fermilab's Worker Safety and Health Program

1. Management Responsibilities

Management responsibilities, including ensuring that workers are qualified for their assignments, investigating incidents in which they may be involved, responding to employee concerns and suggestions have been established.

2. Workers' Rights and Responsibilities

Responsibilities of all employees up to, and including the Fermilab Director have been established. This includes the ability to stop work and raise concerns without fear of reprisal. Personnel are held accountable through a performance review process that evaluates the employees' and supervisors' contribution to the WSH program. ES&H concerns programs and ES&H program implementation document review processes have been established to involve employees in the WSH program. Information on ES&H is made available to employees, visitors, and subcontractors through training, the ES&H Website, and the employee newsletter, FermiToday, the meeting minutes of the Laboratory Safety

Committee and its technical subcommittees, and the Lessons Learned website. Employees are allowed to participate in ES&H activities on official time.

3. Hazard Identification and Assessment

Hazard assessments and inspections by ES&H professionals, including certified safety professionals, certified industrial hygienists, and occupation medicine professionals are routinely performed as part of Fermilab's safety and health program. These include industrial hygiene assessments, walkdown of work area as part of the hazard analysis (HA) process, emergency planning, building inspections and ES&H Tripartite Assessments conducted as part of Fermilab's ES&H self-assessment program. ES&H professionals review construction plans, chemical requisitions, Safety Assessment Documents (SADs), and Hazard Assessment Documents (HADs). They participate in Operational Readiness Clearances (ORCs), HA development, etc. Because of the ES&H professional's strong field presence, they are often actively pursued to participate in the early planning stages of many activities. Fermilab uses standardized exposure monitoring methods and only use AIHA certified laboratories. Monitoring results are recorded through a wide range of industrial hygiene databases to record the results. Results are shared with employees. Safety and health experience information is shared through the technical safety subcommittees of the Laboratory Safety Committee.

4. Hazard Prevention and Abatement

As hazards are identified, they are abated either by substitution with a less hazardous process or chemical, the hazard is engineered out, procedures are developed as appropriate to control the hazard, and if necessary personal protective equipment is mandated. If the hazard cannot be quickly abated interim actions are implemented. ES&H reviews are conducted in the design phase for facilities, experiments, etc. Procedures are in place to assure hazards are addressed when selecting or purchasing equipment, products, and services.

5. Safety and Health Standards

The health and safety standards listed in Section 851.23 and 851.27 are all included in Fermilab's Work Smart Set of Standards. The applicability of these standards are reviewed annually and updated as appropriate. This review process involves an ongoing review and decision making process carried out by the FSO and Fermilab, and is discussed in Fermilab's ES&H Manual.

6. Training and Information

An active ES&H training program is in place to ensure that all workers exposed or potentially exposed to hazards are provided training. Newly hired employees, subcontractors and visiting scientists receive an ES&H orientation, supervisors complete an Individual Training Needs Assessment (ITNA) that identifies all the ES&H training his/her employee is required to take. The employees training plan also identifies periodic retraining that is necessary. Supervisors are responsible to ensure employees have a training plan and are fulfilling the training requirements.

As new hazards are identified, training courses are developed and provided to those employees whose training plans require the training. Those employees that have health and safety program responsibilities are provided the training necessary for them to carry out their responsibilities. Employees such as firefighters, radiological control technicians, and waste management personnel have job-specific training requirements identified in their training plans. This training may be through educational coursework, OTJ training and mentoring with a senior ES&H professional, and continuing education. Training completion is documented in an interactive, online database that provides a management tool to assure employees are appropriately trained.

7. Recordkeeping and Reporting

There are a variety of databases on hazard inventory, assessments, exposure measurements, and exposure records in use at Fermilab. Examples include confined space inventory, engineering notes for pressure vessels, industrial hygiene assessments, and radiological exposures. The requirements for recordkeeping are established in FESHM. All work-related injuries and illnesses for employees, visiting scientists, and subcontractors are recorded in an online database. Work-related incidents, injuries and illnesses are investigated. Data is analyzed for trends and lessons learned are developed and promulgated, with the outcome of the analyses communicated as appropriate.

B. Gap Analysis of Ten Functional Areas

An extensive gap analysis of the requirements of 10 CFR 851 was conducted when the Rule was published. The Rule was sent to the technical subcommittees of the Fermilab Laboratory Safety Committee, or the subject matter expert (SME). These groups involved in the gap analysis included:

1. Electrical Safety Subcommittee
2. Industrial Hygiene Subcommittee
3. Mechanical Safety Subcommittee
4. Subcontractor Safety Subcommittee
5. Senior Fire Protection Engineer/Fire Chief
6. Site Occupational Medicine Director
7. ES&H Section – Safety and Environmental Protection Group

These groups or individuals were charged with reviewing the specific subpart requirements of 10 CFR 851 against Fermilab's established ES&H program. A statement of compliances, identification of non-compliances, and evidence of implementation were requested of the reviewers. Feedback was provided to the Associate Head, ES&H, who oversaw the process and collated the information. The number and significance of non-compliances identified were small. The corrective actions were tracked through the gap analysis document.

A roll-up of the gap analysis results is featured in the second component of Fermilab's Worker Safety and Health Program. Fermilab is in compliance with all the identified applicable functional areas. Those areas that are included in the Rule, but are not applicable to Fermilab operations are noted. Programs will be developed and submitted for approval in the event additional hazards are introduced to the Fermilab site. The gap analysis addresses the following elements of Fermilab's Workers Safety and Health Program.

1. Construction Safety
2. Fire Protection
3. Explosives Safety – Not applicable to the Fermilab Site
4. Pressure Safety
5. Firearms Safety – No applicable to the Fermilab Site
6. Industrial Hygiene
7. Biological Safety – Not applicable to the Fermilab Site
8. Occupational Medicine
9. Motor Vehicle Safety
10. Electrical Safety
11. Nanotechnology Safety – Reserved per 10 CFR 851, Appendix A
12. Workplace Violence Prevention – Reserved per 10 CFR 851, Appendix A

III. Closure Facilities

Fermilab has no facilities that meet the definition of 10 CFR 851.3.

IV. Variances

Fermilab does not have any variances granted by DOE due to inability to meet the codes and standards cited in 10 CFR 851. At this time, there is no intention to submit a variance request to DOE per 10 CFR 851. There are some equivalency determinations that were made in the timeframe from 1994 to 1999. These equivalency assessments were submitted to DOE-FSO. These have been in recognition that there are facilities and equipment at Fermilab that cannot meet specific standards and yet equivalent protection has been provided. The equivalency assessment was performed in accordance with the process established by the standards for which the assessment is being performed. The equivalencies are:

A. Wilson Hall – Life Safety Code Equivalency

This equivalency assessment was submitted to DOE FSO on April 26, 1994. The equivalency assessment was prepared by a registered professional engineer (fire protection engineer). This assessment was conducted on the 16-story high-rise building, Wilson Hall, constructed in the early 1970s. The analysis recommended nine items to be completed to achieve equivalency. These actions were completed in 1996. The most noteworthy item was the installation of an emergency voice alarm system.

B. Main Injector – Automatic Fire Suppression Exemption Request

This equivalency assessment was submitted to DOE FSO on June 15, 1994. The equivalency assessment was prepared by two registered professional engineers (fire protection engineers). The assessment justified the omission of fire sprinkler protection throughout the 2.5-mile underground enclosure from DOE Orders, based on the low risk of a Maximum Credible Fire Loss (MCFL) the presence of fire/smoke detection and manual fire alarm stations, and the ventilation system capable of isolating and segmenting the enclosure.

C. Fermilab's Facility Incident Reporting & Utility System (FIRUS)

This equivalency assessment was submitted to DOE FSO on November 13, 1997. The equivalency assessment was prepared by a registered professional engineer (fire protection engineer). This assessment was conducted on using the existing FIRUS as a central alarm monitoring system as defined by the National Fire Protection Association (NFPA) Fire Alarm Code 72, 1996 Edition.

D. Fermilab's NuMI (MINOS, MI-65, & Target Hall) Project Fire Protection / Life Safety Recommendations

This equivalency assessment was submitted to DOE FSO on October 16, 1998, with a revision submitted April 8, 1999. The equivalency assessment was prepared by a registered professional engineer. This assessment examined the fire alarm, fire suppression, egress, ventilation and pressurization of the two service buildings and the underground NuMI Tunnel requirements. Actions taken to achieve equivalency included designing the main egress from the MINOS tunnel to the surface by elevator, and installing automatic sprinkler protection and detection systems throughout the MINOS, MI-65, and Target Hall areas.

IV. Self-Identification of Non-Compliances

The DOE Office of Enforcement and Investigation is responsible for the enforcement of nuclear safety regulations applicable to the Department of Energy's (DOE) indemnified contractors. They have established the internet-based Noncompliance Tracking System (NTS). This system is to be used by the PAAA Coordinator or alternate for the submission and tracking of potential regulatory non-compliances exceeding thresholds specified by DOE and to develop effective corrective actions to prevent their recurrence. Prompt identification, reporting to DOE, and timely correction of non-compliances may provide

DOE with a basis to exercise discretion to mitigate civil penalties, and suspend the issuance of Notices of Violation for certain violations.

Fermilab has developed processes to allow for the self-identification and reporting of radiation protection and worker health and safety non-compliances. The processes have been codified in FESHM. It identifies threshold reporting criteria intended to be consistent with guidance provided by the DOE. Reporting criteria is also derived from portions of DOE Order 232.1A, Occurrence Reporting and Processing of Operations Information, and its attendant Manual.

Incidents will be reviewed by the ES&H Section to determine whether self-reporting is a suitable action. Assessments and inspection results will be reviewed on a quarterly basis to identify any site-wide programmatic non-compliance that should be reported through NTS. Potential non-compliances beneath the thresholds established will be tracked through the Significant Events Log.

V. Program Plan Maintenance

The Fermilab Worker Safety and Health program is a vibrant, living program. The WSH program plan will be reviewed and submitted to DOE-FSO for approval on an annual basis. Changes in implementing the requirements of 10 CFR 851 will be made as non-compliances are identified.

Significant changes that affect Fermilab's institutional approach to controlling a particular hazard will necessitate a change made to this document. Planned introduction of a hazard not controlled through the current WSH program will require a revision to this document. The revised WSH plan will be submitted to DOE-FSO for approval. Any work involved with the change or addition will not take place until approval of the program is received from DOE-FSO.

In accordance with 10 CFR 851 approval of Fermilab's WSH program will be considered automatic if no response is received from DOE within 90 days of submittal of program.