

ACCELERATOR DIVISION (AD) ADMINISTRATIVE PROCEDURE

ADAP-06-0020

ELECTRICAL/ELECTRONIC SUPPORT DEPARTMENT (EED) MANAGEMENT PROGRAM PLAN
IN SUPPORT OF THE FMI PROJECT:

A Specific Quality Implementation Plan

RESPONSIBLE DEPARTMENT AD/EED

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DATE 4/19/93

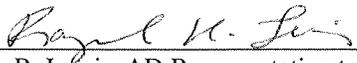
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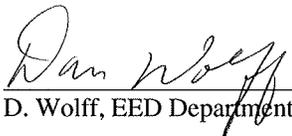
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1.0 PURPOSE AND SCOPE

1.1 Purpose

The purpose of this "Electrical/Electronic Department (EED) Management Program Plan (MPP) for the FMI Project" is to describe the EED functions and organization and its implementation, for its contributions to the Fermilab Main Injector (FMI) Project, of Quality Assurance Criteria 1 through 10, as stated in the Fermilab Quality Assurance Program (dated April 1, 1992), and in conformance with the Accelerator Division (AD) MPP, ADAP-06-0001, Revision 1), and in compliance with DOE Order 5700.6C (dated June 21, 1991).

1.2 Scope

The description and requirements of this plan are generally applicable to all activities of the EED in support of the FMI Project.

2.0 EED FUNCTIONAL ANALYSIS

2.1 EED Terminal Objectives

- TO - 1 To maintain electrical and electronic equipment and systems within the Accelerator as specified by Division management.
- TO - 2 To design and develop new accelerator equipment to be used as upgrades or improvements to the present complex.
- TO - 3 To develop and maintain the AD computer network system.

2.2 EED Subordinate Objectives

- SO - 1 To provide systems expertise in diagnosing accelerator operational problems.
- SO - 2 To repair failed electrical components removed from the machine.
- SO - 3 To train personnel in the proper techniques for maintaining and repairing the equipment.
- SO - 4 To perform preventive maintenance on various electrical equipment within the Division.
- SO - 5 To provide failure tracking and trend analysis for operational equipment and systems.
- SO - 6 To maintain a database that associates specific department personnel with the equipment they are responsible to maintain and repair.
- SO - 7 To support accelerator R&D as required through the design and development of electrical/electronic systems.

3.0 EED ORGANIZATION

The roles, responsibilities and authorities of the leadership positions in the EED, will be described in detail in the EED MPP. An EED organization chart including the names of all personnel in the EED is maintained in the EED Heads Manual.

The responsibilities of the FMI Project Level 3 Manager (L3M) for WBS 1.1.3 (Power Supplies), and the L3M for WBS 1.1.6 (Kickers and Extraction), are listed in FMI PMP, page 16.

4.0 EED SPECIFIC QUALITY IMPLEMENTATION PLAN FOR THE FMI PROJECT

4.1 CRITERION 1 - PROGRAM

4.1.1 This Department MPP is based on the April 1, 1992 Fermilab Quality Assurance Plan (FQAP), on the AD MPP, and on the FMI MPP.

4.1.2 The FMI mission statement has been documented in the approved FMI Project Plan, a DOE document dated May 1992. The objectives of the FMI project are to design, construct, commission, and operate a 150 GeV accelerator. The commissioning goals (Table 1.1, "FMI MPP, ADAP-06-0019, Page 3") have been established to mark the end of construction and the beginning of routine operation for the experimental programs. The operational goals (Table 1.2, "FMI MPP, ADAP-06-0019, Page 3") are for the facility after it has been in use for some months, recognizing that progressive improvements in performance occur as regular operations for the physics research program proceed.

4.1.3 The organizational structure, functional responsibilities and levels of authority for the EED, and the responsibilities of the FMI Project L3M for WBS 1.1.3 and 1.1.6, have been addressed in Section 3.0 above. A complete list of tasks related to the FMI Project that have been assigned to EED employees is to be found in the L3M's office.

4.1.4 The description of all organizational interfaces with other organizations at Fermilab is fully covered in the FMI Project MPP, Section 4.1.4. This material applies equally to the FMI Project MPP and the EED MPP and is not repeated here.

4.2 CRITERION 2 - PERSONNEL TRAINING AND QUALIFICATION

4.2.1 In-house training is provided to insure that an appropriate level of skills, knowledge, expertise, and experience are available to accomplish the stated mission and subordinate objectives. Training may come from several sources such as mentoring provided by physicist, engineers, supervisors, lead personnel, consulting firms, manufacturers' operating manuals, and other sources.

Records of training received by EED members with assigned responsibilities for the FMI Project are to be found EED Heads office in the binder labeled, "AD E/E SUP Training Logs".

Those appointed to management positions within the EED are chosen for their technical and communications skills, as well as their total experience and knowledge of the working on the Laboratory. The AD does not specify any further training or education for these personnel beyond what they initially bring to their positions. However, the department head will normally request or require that personnel in management positions attend the Supervisory Development Course taught by the Laboratory Services Section. The department head may also suggest or require further technical training. The department head may suggest or require that a manager take further management training.

Supervisors within the EED are chosen by the department head. These personnel are chosen based primarily on the basis of their technical abilities. If deemed useful by the department head, an individual supervisor may be requested or required to attend the Supervisory Development course taught by the Laboratory Services Section. Other training or education, oriented toward development of technical and/or supervisory skills, may also be suggested or required by the department head, but there are no generally applicable requirements mandated by the AD.

4.2.2 Environment, Safety and Health (ES&H) training is provided to EED employees, commensurate with the hazards associated with the work performed. The AD ES&H group maintains a data file which records the detail and extent of the training received by each person and is the basis for regular periodic assessment of on-going and repeat training requirements. Specific training requirements are determined by line managers. EED Head maintains copies of ES&H training records.

4.3 CRITERION 3 - QUALITY IMPROVEMENT

The description of Quality Improvement requirements and methods is fully covered in the FMI Project MPP, Section 4.3. This material applies equally to the FMI Project and the EED responsibilities to the FMI Project and is not repeated here.

4.4 CRITERION 4 - DOCUMENTS AND RECORDS

The AD/MID (see the MID MPP) is responsible for implementing a documents and records management system for the FMI Project in order to insure that appropriate, auditable documents and records are retained and retrievable.

4.4.1 In compliance with DOE Order 4700.1 (June 2, 1992 Revision) the requirements for documenting the organization, functions, policies, decisions, procedures and essential transactions of the FMI Project are specified in the FMI Project Management Plan (December 1992) and documents referenced therein.

4.4.2 The Procedure ADDP-MI-0001 "FMI Document Control Center Procedures" defines when documents should fall into the Control Document category; the procedure describes the steps required for Control Documents which includes restrictions on preparation, review, approval, issuance and revisions. The current list of FMI Controlled Documents developed to date include the following:

- The FMI Title I Report
- The FMI Procedure Handbook
- Engineering Change Requests
- The Preliminary Safety Analysis Report
- The Project Management Plan

The FMI Document Control Center is housed in the AD/MID administrative office.

4.4.3 Following DOE Orders 1324.2A (Records Disposition) and 1324.5 (Records Management Program), the FMI records management activities are conducted in accordance with the "Fermilab Records Management Handbook." Detailed procedures are to be found in the Controlled Document FMI Procedures Handbook (see Procedure FMI 001 and 002).

4.4.4 A listing of existing EED Procedures as well as copies of the Procedures themselves are maintained by the EE Department Head. Distribution of EED Procedures is governed by procedure, ADDP-EE-1001, "Department Procedure Control and Responsibilities".

4.5 CRITERION 5 - WORK PROCESSES

4.5.1 The responsibilities of the FMI Project L3Ms, including the L3M for WBS 1.1.3 and 1.1.6, are as described in the FMI PMP (page 16). In particular the L3M for WBS 1.1.3 and 1.1.6 strives for effective human resource management within the EED, with the goals of hiring and maintaining an efficient and effective work force.

4.5.2 The individual EED worker is the first line in ensuring quality. The EED Department Head and the L3M for WBS 1.1.3 and 1.1.6 are responsible for ensuring that people who are assigned to tasks have the appropriate academic qualification, professional certification, or skills and experience to carryout the work successfully.

4.5.3 The EED Department Head and the L3M for WBS 1.1.3 and 1.1.6 are responsible for planning, authorizing, and specifying (to an appropriate level of detail) the conditions under which EED work for the FMI Project is to be performed. The EED Department Head and the L3M for WBS 1.1.3 and 1.1.6 specify which work is sufficiently complex or involves sufficient hazard to be performed to written procedures. When written procedures are deemed appropriate they will be prepared, revised, approved, and distributed as ADDP's, as prescribed by ADAP-01-0001.

4.5.4 The EED Supervisors define the performance objectives for which EED personnel who work on the FMI Project will be held accountable. In addition criteria which define acceptable work performance and achievement of performance objectives with the goal of acknowledging when work has been performed acceptably and identifying areas for improvement are also defined by the EED Supervisors.

4.5.5 The Fermilab contract with DOE defines a variety of management systems to be applied to material resources through the applicable DOE Orders and Code of Federal Regulations (CFR). EED Group Leaders have the responsibility to insure that equipment items shall be identified and controlled to insure their proper use, and maintained to prevent their damage, loss or deterioration.

4.6 CRITERION 6 - DESIGN

4.6.1 The Fermilab Director requires that sound engineering/scientific principles and appropriate technical standards are incorporated into FMI designs to ensure that they will perform as intended. This policy is implemented by the FMI Project Manager and the L3Ms, including the L3M for WBS 1.1.3 and 1.1.6. The FMI Title I Design Report (the FMI design handbook) has been independently reviewed in order to assure compliance with the policy.

ES&H related design input and design review requirements to ensure compliance with facility ES&H requirements are specified in the FMI PMP. These include NEPA compliance, achieved by the preparation of the FMI Environmental Assessment (EA) which lead to a Finding of No Significant Impact (FONSI) by EH-1. In addition a FMI Preliminary Safety Analysis Report (PSAR) has been completed and approved, and a Technical Safety Review has taken place.

Appropriate design controls are incorporated in the FMI Configuration Management Plan (CMP) and the FMI Control System. Changes and modifications including their validation are controlled by FMI Engineering Change Request as defined in Procedure ADDP-MI-0002. Design records are incorporated into the FMI records management system (see Procedure ADDP-MI-0001).

4.7 CRITERION 7 - PROCUREMENT

4.7.1 The Fermilab contract with DOE specifies a variety of management controls to be applied to procurements and sub-contracts through the applicable DOE Orders, Department of Energy Acquisition Regulations (DEAR) and Federal Acquisition Regulations (FAR). Details of Fermilab's implementation of procurement and sub-contract management controls are to be found in Fermilab Quality Assurance Program (April 1, 1992), page 6.

4.7.2 Implementation of procurement management requirements by the FMI Project is described in the FMI PMP, in particular see Annex I of the PMP, "Advance Acquisition or Assistance Plan for the FMI." In addition the document "FMI ES&H Procedures for Construction" requires the inclusion of applicable ES&H specifications in sub-contracts.

4.8 CRITERION 8 - INSPECTION AND ACCEPTANCE TESTING

4.8.1 The EED Group Leaders define the types of work that require formal inspections and acceptance testing. When an inspection or acceptance test is performed, the characteristics and processes to be inspected or tested, the inspection techniques to be used, the hold points, and the acceptance criteria are defined as appropriate. Properly calibrated and maintained measuring and test equipment are used for acceptance testing.

4.8.2 The Accelerator Readiness Reviews for the FMI Project will conform to the requirement of DOE Order 5480.25 (Accelerator Safety Order). The subsequent operation and maintenance of the FMI will conform to the Fermilab implementation of DOE Order 5480.19 (Conduct of Operations) and DOE Order 4330.4A (Maintenance Management Program).

4.9 CRITERION 9 - MANAGEMENT ASSESSMENT

4.9.1 The FMI PMP (in particular sections IV and IX) describes how FMI Project management periodically evaluates whether or not the FMI management infrastructure and resources are properly focused on achieving the FMI mission objectives. This includes a weekly project status meeting, chaired by the MID Department Head, which is attended by the FMI Project Manager, all MID Department staff, and all L3Ms, including the L3M for WBS 1.1.3 and 1.1.6. As the FMI Project progresses, every effort will be

made to apply the Risk-Based Graded Approach to Implementation as specified in ADAP - 06 - 0001, Rev. 1, Section 3.0, Pages 4 and 5.

4.9.2 The ES&H performance of the FMI Project including the work done by the EED is periodically evaluated in accordance with the AD ES&H Self-Assessment Plan.

4.10 CRITERION 10 - INDEPENDENT ASSESSMENT

4.10.1 The Fermilab Director has assigned responsibility for performing independent assessment to the Quality Assurance, Conduct of Operations, and Self Assessment Offices in the directorate.

4.10.2 Independent assessments of the performance of the EED by the AD are carried out as specified in the AD MPP.

5.0 EXTRA-DIVISIONAL DISTRIBUTION

NONE