Chapter 13 Conduct of Operations

The introductory paragraph of this chapter of the referenced DCD is incorporated by reference with no departures or supplements.

13.1 Organizational Structure of Applicant

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

DCD Section 13.1.1, Combined License Information, is renumbered in this FSAR as Subsection 13.1.4 for administrative purposes to allow section numbering to be consistent with RG 1.206 and the Standard Review Plan.

Replace the first paragraph with the following.

EF3 COL 13.1-1-A

This section describes the organization of Fermi 3. The organizational structure is described in this section and is consistent with the Human System Interface (HSI) design assumptions used in the design of the ESBWR as described in DCD Chapter 18. The organizational structure is consistent with the ESBWR HFE design requirements and complies with the requirements of 10 CFR 50.54(i) through (m).

13.1.1 Management and Technical Support Organization

Detroit Edison has over 35 years of experience in the operation of nuclear generating stations. Detroit Edison currently operates Fermi 2.

Corporate offices provide support for Fermi site including executive level management to provide strategic and financial support for plant initiatives, and coordination of functional efforts.

Section 17.5 provides high-level illustrations of the corporate organization. More detailed charts and position descriptions, including qualification requirements and staffing numbers for corporate support staff, are maintained in corporate offices.

13.1.1.1 Design, Construction, and Operating Responsibilities

The chief nuclear officer (CNO) has overall responsibility for functions involving planning, design, construction, and operation of Detroit Edison's current and future nuclear units. Line responsibilities for those functions are passed to the executives in charge of nuclear operations,

engineering and technical services, planning, development, and oversight, who maintain direct control of nuclear plant activities.

The first priority and responsibility of each member of the nuclear staff throughout the life of the plant is nuclear safety. Decision making for station activities is performed in a conservative manner with expectations of this core value regularly communicated to appropriate personnel by management interface, training, and station directives.

Lines of authority and communication clearly and unambiguously establish that utility management directs the project.

At key project milestones, including beginning of construction, fuel load, and commercial operation, senior management determines if there are sufficient numbers of qualified personnel available to move the project forward.

Key executive and corporate management positions, functions, and responsibilities are discussed in Section 17.5. The construction management organization is shown in Figure 13.1-201.

13.1.1.1.1 Design and Construction Responsibilities

This section is included in Appendix 13AA for future designation as historical information.

13.1.1.2 Technical Support for Plant Operations

This section describes the functional groups that become activated before fuel load. The site executive establishes the organization of managers, functional managers, supervisors, and staff sufficient to perform required functions for support of safe plant operation. These functions include the following:

- Nuclear, mechanical, structural, electrical, thermal-hydraulic, metallurgical and material, and instrumentation and controls engineering
- Plant chemistry
- Radiation protection
- Fueling and refueling operations support
- Maintenance support
- Operations support
- Quality assurance

- Training
- Safety review
- Fire protection
- Emergency organization
- Outside contractual assistance

In the event that station personnel are not qualified to deal with a specific problem, the services of qualified individuals from other functions within the company or outside consultants are engaged. Figures incorporated into Section 17.5 illustrate the management and technical organizations supporting operation of the plant. Table 13.1-201 shows the estimated number of positions required for each function.

13.1.1.2.1 Engineering

The engineering department consists of system engineering, design engineering, engineering programs, engineering projects, safety and engineering analysis, and reactor engineering. These groups are responsible for performing the classical design activities as well as providing engineering expertise for programs, such as reactor engineering, inservice inspection (ISI), inservice testing (IST), snubbers, and maintenance rule. Engineering is also responsible for probabilistic safety assessment and other safety issues, plant system reliability analysis, performance and technical support, core management, and periodic reactor testing.

Each of the engineering groups has a functional manager who reports to the director in charge of engineering.

The engineering organization is responsible for:

- Support of plant operations in the engineering areas of mechanical, structural, electrical, thermal-hydraulic, metallurgical, materials, electronic, and instrument and control. Priorities for support activities are established based on input from the plant manager with emphasis on issues affecting safe operation of the plant.
- Support of procurement, chemical and environmental analysis, and maintenance activities in the plant as requested by the plant manager
- Performance of design engineering of plant modifications

- Maintaining the design basis by updating the record copy of design documents as necessary to reflect the actual as-built configuration of the plant
- Accident and transient analyses
- Human Factors Engineering design process

Reactor engineering, led by the functional manager in charge of reactor engineering, provides technical assistance in the areas of core operations, core thermal limits, and core thermal hydraulics.

Design work may be contracted to and performed by outside companies in accordance with Section 17.5.

13.1.1.2.2 Plant Chemistry

A chemistry program is established to monitor and control the chemistry of various plant systems such that corrosion of components and piping is minimized and radiation from corrosion by-products is kept to levels that allow operations and maintenance with radiation doses as low as is reasonably achievable.

The functional manager in charge of chemistry is responsible for maintaining chemistry programs and for monitoring and maintaining the water chemistry of plant systems. The staff of the chemistry department consists of laboratory technicians, support personnel, and supervisors who report to the functional manager in charge of chemistry.

13.1.1.2.3 Radiation Protection

A radiation protection (RP) program is established to protect the health and welfare of the surrounding public and personnel working at the plant. The RP program is described in Chapter 12.

The RP department is staffed by radiation protection technicians, support personnel, and supervisors who report to the radiation protection manager. To provide sufficient organizational freedom from operating pressures, the radiation protection manager reports directly to the director responsible for facility safety and licensing.

Personnel resources of the RP organization are shared between units. A single management organization oversees RP for the units.

13.1.1.2.4 Fueling and Refueling Operations Support

The function of fueling and refueling is performed by a combination of personnel from various departments including operations, maintenance, radiation protection, engineering, and reactor technology vendor or other contractor staff. Initial fueling is a function of the startup management organization discussed in Appendix 13AA. Refueling operations are a function of the operations organization.

13.1.1.2.5 Maintenance Support

The maintenance department includes mechanical maintenance, electrical maintenance, and instrumentation and control (I&C) groups. Each group includes supervisors, foremen, and technicians in sufficient numbers to provide for the safe and efficient operation of the plant during all phases of plant life.

In support of maintenance activities, planners, schedulers, and parts specialists prepare work packages, acquire proper parts, and develop procedures that provide for the successful completion of maintenance tasks. Maintenance tasks are integrated into the station schedule for evaluation of operating or safe shutdown risk elements and to provide for efficient and safe performance. Functional managers in charge of planning and scheduling report to outage and planning management.

13.1.1.2.6 Operations Support

The operations support function is provided under the direction of the operations manager, and includes the following programs:

- Operations procedures
- Operations surveillances
- Equipment tagging preparation
- Fuel handling

13.1.1.2.7 Quality Assurance

Safety-related activities associated with the operation of the plant are governed by the quality assurance (QA) program described in Chapter 17. QA includes:

- Maintenance of the QAPD
- Coordinating the development of audit schedules
- Audit, surveillance, and evaluation of Nuclear Division suppliers

- Quality control (QC) inspection/testing activities

QA management is independent of the station management line organization. The manager of QA reports administratively to the director responsible for facility safety and licensing and functionally to the site executive.

Personnel resources of the QA organization are shared between units. A single management organization oversees the QA group for the site.

13.1.1.2.8 Training

The training department is responsible for providing training programs that are established, maintained, and implemented in accordance with applicable plant administrative directives, regulatory requirements, and company operating policies so that station personnel can meet the performance requirements of their jobs in operations, maintenance, technical support, emergency response, and other areas. The training department's responsibilities encompass operator initial license training, requalification training, and plant staff training as well as the plant access training (general employee training) course and radiation worker training. To maintain independence from operating pressures, the manager of training reports to the director responsible for facility safety and licensing. Nuclear plant training programs are described in Section 13.2.

To the extent practicable given the differences between plant designs, personnel resources of the training department are shared between units. A single management organization provides oversight of station training activities.

13.1.1.2.9 Safety Review

Review and audit activities are addressed in Chapter 17.

Oversight of station programs, procedures, and activities is performed by the Onsite Safety Review Organization (OSRO) and an Independent Review Body (IRB), which is responsible for review of corrective actions for significant conditions adverse to quality and the audit program. The supervisor in charge of the IRB ultimately reports to the site executive.

In the event of an unplanned reactor trip or significant power reduction, it is the responsibility of the OSRO to determine the circumstances, analyze the cause, and determine that operations can proceed safely before the reactor is returned to power.

Personnel resources of the IRB organization are shared between units. A single management organization oversees the site IRB organization.

13.1.1.2.10 Fire Protection

The station is committed to maintaining a fire protection program as described in DCD Section 9.5.1.15. Fire protection for the facility is organized and administered by the functional manager in charge of fire protection. The functional manager in charge of fire protection is responsible for development and implementation of the fire protection program including development of fire protection procedures, site personnel and fire brigade training, and inspections of fire protection systems and functions. Functional descriptions for all responsible positions are included in appropriate procedures. Station personnel are responsible for adhering to the fire protection/prevention requirements detailed in Subsection 9.5.1. The site construction executive will have the lead responsibility for overall construction site fire protection during construction. The fire brigade is described in Subsection 13.1.2.1.5.

13.1.1.2.11 Emergency Organization

The emergency preparedness organization is a matrixed organization composed of personnel who have the experience, training, knowledge, and ability necessary to implement actions to protect the public in the case of emergencies. Managers and station personnel assigned to positions in the emergency organization are responsible for supporting the emergency preparedness organization and the emergency plan as required. The staff members of the emergency planning organization administer and orchestrate drills and training to maintain qualification of station staff members, and develop procedures to guide and direct the emergency organization during an emergency. The functional manager in charge of emergency preparedness reports to the director responsible for facility safety and licensing. The site emergency plan organization is described in the Emergency Plan.

13.1.1.2.12 Outside Contractual Assistance

Contract assistance with vendors and outside suppliers is provided by the materials, procurement, and contracts organization. The functional manager in charge of materials, procurement, and contracts reports to the engineering, procurement and construction (EPC) executive.

Resources and management of the materials, procurement, and contracts organization are shared between units.

13.1.1.3 Organizational Arrangement

Organizational arrangement for corporate offices and site organizations reporting directly to corporate offices is presented in Section 17.5.

13.1.1.4 Qualifications of Technical Support Personnel

Personnel of the technical support organization meet the education and experience qualifications for those described in ANSI/ANS-3.1 (Reference 13.1-201) as endorsed and amended by RG 1.8.

13.1.2 Operating Organization

13.1.2.1 Plant Organization

The plant management, technical support, and plant operating organizations are incorporated into Section 17.5. Additional personnel are required to augment normal staff during outages.

Nuclear plant employees are responsible for reporting problems with plant equipment and facilities. They are required to identify and document equipment problems in accordance with the QA program. QA program requirements as they apply to the operating organization are described in Section 17.5.

Rules of practice are met through administrative controls as described in Section 17.5. These controls include:

- Establishment of a quality assurance program for the operational phase
- Preparation of procedures necessary to carry out an effective quality assurance program
- A program for review and audit of activities affecting plant safety
- Programs and procedures for rules of practice

Managers and supervisors within the plant operating organization are responsible for establishing goals and expectations for their organization and to reinforce behaviors that promote radiation protection. Specifically, managers and supervisors are responsible for the following, as applicable to their position within the plant organization:

- Interfacing directly with radiation protection staff to integrate radiation protection measures into plant procedures and design documents into

the planning, scheduling, conduct, and assessment of operations and work

- Notifying radiation protection personnel promptly when radiation protection problems occur or are identified, taking corrective actions, and resolving deficiencies associated with operations, procedures, systems, equipment, and work practices
- Training site personnel on radiation protection and providing periodic retraining in accordance with 10 CFR 19 so that personnel are properly instructed and briefed for entry into restricted areas
- Periodically observing and correcting, as necessary, radiation worker practices
- Supporting radiation protection management in implementing the radiation protection program
- Maintaining exposures to site personnel As Low As Reasonably Achievable (ALARA)

The operating organization is further defined in Section 17.5.

13.1.2.1.1 Site Executive

The site executive reports to the chief nuclear officer. The site executive is directly responsible for management and direction of activities associated with the efficient, safe, and reliable operation of the nuclear station. The site executive is assisted in management and technical support activities by the plant manager, the plant safety and licensing (S&L) director, the site support director and the engineering director. Executive management establishes expectations such that a high level of quality, safety, and efficiency is achieved in aspects of plant operations and support activities through an effective management control system and an organization selected and trained to meet the above objectives.

Additionally, the site executive has overall responsibility for occupational and public radiation safety. Radiation protection responsibilities of the vice president, nuclear generation are consistent with the guidance in RG 8.8 and RG 8.10, including the following:

- Providing management radiation protection policy throughout the plant organization
- Providing an overall commitment to radiation protection by the plant organization

- Interacting with and supporting the radiation protection manager on implementation of the radiation protection program
- Supporting identification and implementation of cost-effective modifications to plant equipment, facilities, procedures and processes to improve radiation protection controls and reduce exposures
- Establishing plant goals and objectives for radiation protection
- Maintaining exposures to site personnel ALARA
- Supporting timely identification, analysis, and resolution of radiation protection problems (e.g., through the plant corrective action program)
- Providing training to site personnel on radiation protection in accordance with 10 CFR 19
- Establishing an ALARA Committee with delegated authority from the site that includes the managers in charge of operations, maintenance, engineering, and radiation protection to help provide for effective implementation of line organization responsibilities for maintaining worker doses ALARA

The succession of responsibility for overall plant instructions or special orders in the event of absences, incapacitation of personnel, or other emergencies is as follows, unless otherwise designated in writing:

- The site executive
- The plant manager
- The operations manager

The succession of authority includes the authority to issue standing or special orders as required.

13.1.2.1.1.1 **Plant Manager**

The plant manager reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Operations
- Maintenance and modification
- Outage management

13.1.2.1.1.2 **Plant Safety & Licensing (S&L) Director**

The plant S&L director reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities

necessary for safe operation and maintenance of the plant including the following:

- Training
- Licensing and emergency preparedness
- Radiation protection
- Chemistry and radiochemistry
- Quality assurance

13.1.2.1.1.3 **Engineering Director**

The engineering director reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Design engineering
- Systems engineering
- Program engineering
- Reactor engineering
- Procurement engineering

13.1.2.1.1.4 **Site Support Director**

The site support director reports to the site executive, is responsible for safe operation of the plant, and has control over onsite activities necessary for safe operation and maintenance of the plant including the following:

- Fire protection
- Physical security
- Procedures and document control
- Information systems interface
- Supply chain interface

13.1.2.1.1.5 **Maintenance Manager**

Maintenance of the plant is performed by the maintenance department mechanical, electrical, and instrumentation and control disciplines. The functions of this department are to perform preventive and corrective maintenance, equipment testing, and implement modifications as necessary.

The manager in charge of plant maintenance is responsible for the performance of preventive and corrective maintenance and modification activities required to support operations, including compliance with applicable standards, codes, specifications, and procedures. The maintenance manager reports to the plant manager and provides direction and guidance to the maintenance discipline functional managers and maintenance support staff.

13.1.2.1.1.6 Maintenance Discipline Functional Managers

The functional managers of each maintenance discipline (mechanical, electrical, instrumentation and control, and support) are responsible for maintenance activities within their discipline including plant modifications. They provide guidance in maintenance planning and craft supervision. They establish the necessary manpower levels and equipment requirements to perform both routine and emergency type maintenance activities, seeking the services of others in performing work beyond the capabilities of the plant maintenance group. Each discipline functional manager is responsible for liaison with other plant staff organizations to facilitate safe operation of the station. These functional managers report to the maintenance manager.

13.1.2.1.1.7 Maintenance Discipline Supervisors

The maintenance discipline supervisors and assistant supervisors (mechanical, electrical, and instrumentation and control) supervise maintenance activities, assist in the planning of future maintenance efforts, and guide the efforts of the craft within their discipline. The maintenance discipline supervisors report to the appropriate maintenance discipline functional managers.

13.1.2.1.1.8 Maintenance Mechanics, Electricians, and Instrumentation and Control Technicians

The discipline craft perform electrical and mechanical maintenance and I&C tasks as assigned by the discipline supervisors. They troubleshoot, inspect, repair, maintain, and modify plant equipment and perform Technical Specification surveillances on equipment for which they have cognizance. They perform these tasks in accordance with approved procedures and work packages.

13.1.2.1.1.9 Outage and Planning Manager

The outage and planning manager is responsible for the support functions described in Subsection 13.1.1.2.5. This manager safely fulfills the responsibilities of planning and scheduling all plant work through a staff which includes a functional manager in each area of planning, scheduling, and outages. The outage and planning manager reports to the plant manager.

13.1.2.1.1.10 Radiation Protection Manager

The radiation protection manager has the direct responsibility for providing adequate protection of the health and safety of personnel working at the plant and members of the public during activities covered within the scope and extent of the license. This manager's radiation protection responsibilities are consistent with the guidance in RG 8.8 and RG 8.10. They include:

- Managing the radiation protection organization
- Establishing, implementing, and enforcing the radiation protection program
- Providing radiation protection input to facility design and work planning
- Tracking and analyzing trends in radiation work performance and taking necessary actions to correct adverse trends
- Supporting the plant emergency preparedness program and assigning emergency duties and responsibilities within the radiation protection organization
- Delegating authority to appropriate radiation protection staff to stop work or order an area evacuated (in accordance with approved procedures) when, in his or her judgment, the radiation conditions warrant such an action and such actions are consistent with plant safety
- Managing the radioactive waste programs

The radiation protection manager reports to the plant S&L director and is assisted by the supervisors in charge of radiation protection.

13.1.2.1.1.11 Radiation Protection Supervisors

The supervisors in charge of radiation protection are responsible for carrying out the day-to-day operations and programs of the radiation

protection department as listed in Subsection 13.1.1.2.3, to promote safe, legal, and efficient plant operation.

Radiation protection supervisors report to the radiation protection manager.

13.1.2.1.1.12 Radiation Protection Technicians

Radiation protection technicians (RPTs) directly carry out responsibilities defined in the radiation protection program and procedures. In accordance with Technical Specifications, an RPT is on site whenever there is fuel in the vessel.

The following are some of the duties and responsibilities of the RPTs:

- In accordance with authority delegated by the manager in charge of radiation protection, stop work or order an area evacuated (in accordance with approved procedures) when, in his or her judgment, the radiation conditions warrant such an action and such actions are consistent with plant safety
- Provide coverage and monitor radiation conditions for jobs potentially involving significant radiation exposure
- Conduct surveys, assess radiation conditions, and establish radiation protection requirements for access to and work within restricted, radiation, high radiation, very high radiation, airborne radioactivity areas, and areas containing radioactive materials
- Provide control over the receipt, storage, movement, use, and shipment of licensed radioactive materials
- Review work packages, proposed design modifications, and operations and maintenance procedures to facilitate integration of adequate radiation protection controls and dose-reduction measures
- Review and oversee implementation of plans for the use of process or other engineering controls to limit the concentrations of radioactive materials in the air
- Provide personnel monitoring and bioassay services
- Maintain, prescribe, and oversee the use of respiratory protection equipment
- Perform assigned emergency response duties.

13.1.2.1.1.13 Functional Manager in Charge of Chemistry

The functional manager in charge of chemistry is responsible for development, implementation, and direction and coordination of the chemistry, radiochemistry, and non-radiological environmental monitoring programs. This area includes overall operation of the hot lab, cold lab, emergency offsite facility lab, and non-radiological environmental monitoring. The functional manager in charge of chemistry is responsible for the development, administration, and implementation of procedures and programs which provide for effective compliance with environmental regulations. The functional manager in charge of chemistry reports to the plant S&L director via the radiation protection manager and directly supervises the chemistry supervisors.

The functional manager in charge of chemistry is responsible for assuring that a chemistry technician is on site whenever the unit is in modes other than cold shutdown or refueling.

13.1.2.1.1.14 Functional Manager in Charge of Fire Protection

The functional manager in charge of fire protection is responsible for the following:

- Fire protection program requirements, including consideration of potential hazards associated with postulated fires, knowledge of building layout, and system design
- Post-fire shutdown capability
- Design, maintenance, surveillance, and quality assurance of fire protection features (e.g., detection systems, suppression systems, barriers, dampers, doors, penetration seals, and fire brigade equipment
- Fire prevention activities (administrative controls and training)
- Fire brigade organization and training
- Pre-fire planning, including review and updating of pre-fire plans at least every two years

The functional manager in charge of fire protection reports to the director responsible for site support. Additionally, the functional manager in charge of fire protection works with the operations and engineering departments to coordinate activities and program requirements with the those organizations. In accordance with RG 1.189, the functional manager in charge of fire protection is an individual who has been

delegated authority commensurate with the responsibilities of the position and who has available staff personnel knowledgeable in both fire protection and nuclear safety.

13.1.2.1.2 Operations Department

All operations activities are conducted with safety of personnel, the public, and equipment as the overriding priority. The operations department is responsible for:

- Operation of station equipment
- Monitoring and surveillance of safety- and non-safety-related equipment
- Fuel loading
- Providing the nucleus of emergency and fire-fighting teams

The operations department maintains sufficient licensed and senior licensed operators to staff the control room continuously using a crew rotation system. The operations department is under the authority of the manager in charge of operations who, through the supervisor in charge of shift operations, directs the day-to-day operation of the plant.

Specific duties, functions, and responsibilities of key shift members are discussed in Subsection 13.1.2.1.2.4 through Subsection 13.1.2.1.2.8 and in plant administrative procedures and the Technical Specifications. The minimum shift manning requirements are shown in Table 13.1-202.

For activities that do not require an operator's license, resources of the operations organization may be shared between units. These activities may include administrative functions and tagging. To operate or supervise the operation of more than one unit, an operator (SRO or RO) must hold an appropriate, current license for each unit. See Table 13.1-201 for expected staffing of the operations department, and Table 13.1-202 for minimum shift staffing.

The Operations Support Section is staffed with sufficient personnel to provide support activities for the operating shifts and overall operations department. The following is an overview of the operations organization.

13.1.2.1.2.1 Operations Manager

The operations manager has overall responsibility for the day-to-day operation of the plant. The operations manager reports to the plant manager and is assisted by the supervisors of shift operations,

operations support, and operations maintenance advisor. Either the operations manager or the supervisor of shift operations is SRO licensed.

13.1.2.1.2.2 Supervisor of Shift Operations

The supervisor of shift operations, under the direction of the operations manager, is responsible for:

- Shift plant operations in accordance with the operating license, Technical Specifications, and written procedures
- Providing supervision of operating shift personnel for operational shift activities including those of emergency and firefighting teams
- Coordinating with the supervisor of operations support and other plant staff sections
- Verifying that nuclear plant operating records and logs are properly prepared, reviewed, evaluated and turned over to the assistant manager in charge of operations support

The supervisor of shift operations is assisted in these areas by the on-shift operations manager who directs the operating shift personnel. The supervisor of shift operations may assume the duties of the operations manager in the event of an absence.

13.1.2.1.2.3 Supervisor of Operations Support

The supervisor of operations support, under the direction of the operations manager is responsible for:

- Directing and guiding plant operations support activities in accordance with the operating license, Technical Specifications, and written procedures
- Providing supervision of operating support personnel and operations support activities, and coordination of support activities
- Providing for nuclear plant operating records and logs to be turned over to the nuclear records group for maintenance as quality records

The supervisor of operations support is assisted by the supervisors of work management, radwaste operations, operations procedures group, and other support personnel. In the absence of the operations manager, the supervisor of operations support may assume the duties and responsibilities of this position.

13.1.2.1.2.4 Operations Shift Manager

The operations shift manager is a licensed senior reactor operator (SRO) responsible for the control room command function, and is the plant manager's direct management representative for the conduct of operations. The operations shift manager has the responsibility and authority to direct the activities and personnel onsite as required to:

- Protect the health and safety of the public, the environment, and personnel on the plant site
- Prevent damage to site equipment and structures
- Comply with the operating license

The operations shift manager retains this responsibility and authority until formally relieved of operating responsibilities by a licensed SRO. Additional responsibilities of the operations shift manager include:

- Directing nuclear plant employees to report to the plant for response to potential and real emergencies
- Seeking the advice and guidance of the shift technical advisor and others in executing his duties whenever in doubt as to the proper course of action
- Promptly informing responsible supervisors of significant actions affecting their responsibilities
- Participating in operator training, retraining, and requalification activities from the standpoint of providing guidance, direction, and instruction to shift personnel

The operations shift manager is assisted in carrying out the above duties by the on-shift unit supervisors and the operating shift personnel. The shift operations manager reports to the supervisor of shift operations.

13.1.2.1.2.5 On-Shift Unit Supervisor

The on-shift unit supervisor is a licensed SRO. The main functions of the on-shift unit supervisor are to administratively support the operations shift manager such that the "command function" is not overburdened with administrative duties and to supervise the licensed and non-licensed operators in carrying out the activities directed by the operations shift manager. Other duties and responsibilities include:

- Being aware of maintenance and testing performed during the shift
- Directing reactor shutdown if conditions warrant this action

- Informing the operations shift manager and other station management in a timely manner of conditions which may affect public safety, plant personnel safety, plant capacity or reliability, or cause a hazard to equipment
- Initiating immediate corrective action as directed by the operations shift manager in any upset situation until assistance, if required, arrives
- Participating in operator training, retraining, and requalification activities from the standpoint of providing guidance, direction, and instruction to shift personnel
- Responding conservatively to instrument indications unless they are proved to be incorrect
- Adhering to the plant's technical specifications
- Reviewing routine operating data to assure safe operation

The on-shift unit supervisor reports directly to the operations shift manager.

13.1.2.1.2.6 **Reactor Operator**

Reactor operators (RO) are licensed personnel and normally report to the on-shift unit supervisor. They are responsible for routine plant operations and performance of major evolutions at the direction of the on-shift unit supervisor. The RO duties and responsibilities include:

- Monitoring control room instrumentation
- Responding to plant or equipment abnormalities in accordance with approved plant procedures
- Directing the activities of non-licensed operators
- Documenting operational activities, plant events, and plant data in shift logs
- Responding conservatively to instrument indications unless they are proved to be incorrect
- Adhering to the plant's technical specifications
- Reviewing routine operating data to assure safe operation
- Initiating plant shutdowns or scrams or other compensatory actions when:

- Observation of plant conditions indicates a nuclear safety hazard exists
- Approved procedures so direct
- The operator determines that the safety of the reactor is in jeopardy
- Operating parameters exceed any of the reactor protection system setpoints and automatic shutdown does not occur

Whenever there is fuel in the reactor vessel, at least one reactor operator is in the control room monitoring the status of the unit at the main control panel. The RO assigned to the main control panel is designated the Operator-At-The Controls (OATC) and conducts monitoring and operating activities in accordance with the guidance set forth in RG 1.114, which is further described in Subsection 13.1.2.1.3.

13.1.2.1.2.7 Non-Licensed Operator

The non-licensed operators perform routine duties outside the control room as necessary for continuous, safe plant operation including:

- Assisting in plant startup, shutdown, surveillance, and emergency response by manually or remotely changing equipment operating conditions, placing equipment in service, or securing equipment from service at the direction of the RO
- Performing assigned tasks in procedures and checklists such as valve manipulations for plant startup or data sheets on routine equipment checks, and making accurate entries according to the applicable procedure, data sheet, or checklist
- Assisting in training of new employees and improving and upgrading their own performance by participating in the applicable sections of the training program

13.1.2.1.2.8 Shift Technical Advisor

The station is committed to meeting NUREG-0737 TMI Action Plan item I.A.1.1 for shift technical advisors (STAs). The STA reports directly to the shift manager and provides advanced technical assistance to the operating shift complement during normal and abnormal operating conditions. The STA's responsibilities are detailed in plant administrative procedures as required by TMI Action Plan I.A.1.1 and NUREG-0737, Appendix C. These responsibilities include:

- Monitoring core power distribution and critical parameters
- Assisting the operating shift with technical expertise during normal and emergency conditions
- Evaluating technical specifications, special reports, and procedural issues

The STA contributes to operations safety by independently observing plant status and advising shift supervision of conditions that could compromise plant safety. During transients or accident situations, the STA independently assesses plant conditions and provides technical assistance and advice to mitigate the incident and minimize the effect on personnel, the environment, and plant equipment.

An SRO on shift who meets the qualifications for the combined SRO/STA position specified for Option 1 of Generic Letter 86-04 (Reference 13.1-202) may also serve as the STA. If this option is used for a shift, the separate STA position may be eliminated for that shift.

13.1.2.1.2.9 Nuclear Operations Maintenance Advisor

The nuclear operations maintenance advisor is a licensed SRO. The primary function of this position is to directly supervise activities by non-licensed personnel outside the control room that could affect safe operation of the plant. These activities include, but are not limited to:

- Valve lineups
- Equipment tagging
- Surveillances or other testing activities
- Building rounds
- Maintenance activities

The nuclear operations maintenance advisor reports directly to the manager of nuclear operations.

13.1.2.1.2.10 Nuclear Operations Support Supervisor

The nuclear operations support supervisor is a licensed SRO. The primary function of the nuclear operations support supervisor is to review and authorize maintenance, surveillance, or other work or testing activities being performed in the plant. The responsibilities of the nuclear operations support supervisor include keeping the operations shift manager and other operations personnel informed of activities for which they need to be cognizant, verifying that work and testing is safe and

appropriate for the existing conditions of the plant, and tracking the work and testing to provide assurance that any LCOs or other requirements will not be exceeded. The nuclear operations support supervisor reports directly to the manager of nuclear operations.

13.1.2.1.3 Conduct of Operations

Station operations are controlled and coordinated through the control room. Maintenance activities, surveillances, and removal from/return to service of SSCs affecting the operation of the plant may not commence without the authority of senior control room personnel. The rules of practice for control room activities, as described by administrative procedures, which are based on RG 1.114, address the following:

- Position/placement of the workstation for the operator at the controls and the expected area of the control room where the supervisor/manager in charge on shift should spend the majority of on-shift time
- Definition and outline of “surveillance area” and requirement for continuous surveillance by the operator at the controls
- Relief requirements for operator at the controls and the supervisor/manager in charge on shift

In accordance with 10 CFR 50.54 (i), (j), (k), (l), and (m):

- Reactivity controls may be manipulated only by licensed operators and senior operators except as allowed for training under 10 CFR 55
- Apparatus and mechanisms other than controls which may affect reactivity or power level of the reactor shall be operated only with the consent of the operator at the controls or the manager/supervisor in charge on-shift
- An operator or senior operator shall be present at the controls at all times during the operation of the facility
- For each shift, operations management designates one or more SROs to be responsible for directing the licensed activities of licensed operators
- An SRO shall be present at the facility or readily available on call at all times during its operation, and shall be present at the facility during initial start-up and approach to power, recovery from an unplanned or unscheduled shut-down or significant reduction in power, and refueling, or as otherwise prescribed in the facility license

- Minimum shift staffing for operations personnel is shown in Table 13.1-201
- With the unit in modes other than cold shutdown or refueling, there shall be one SRO in the control room at all times. In addition, there shall be one RO or one SRO at the controls whenever there is fuel in the reactor vessel

13.1.2.1.4 Operating Shift Crews

Plant administrative procedures implement the required shift staffing. These provisions establish crews with sufficient qualified plant personnel to staff the operational shifts and be readily available in the event of an abnormal or emergency situation. The objective is to operate the plant with the required staff and to develop work schedules that minimize overtime for plant staff members who perform safety-related functions. Work hour limitations and shift manning requirements defined by TMI Action Plan I.A.1.3 are addressed in station procedures. Shift crew staffing plans may be modified during refueling outages to accommodate safe and efficient completion of outage work in accordance with work hour limitations established in administrative procedures.

The minimum composition of an operating shift depends on the operational mode, as shown in Table 13.1-202. Reporting relationships for these positions are shown in Figure 13.1-203.

EF3 COL 9.5.1-10-H

13.1.2.1.5 Fire Brigade

The plant is designed, and the fire brigade organized, to be self-sufficient with respect to fire fighting activities. The fire brigade is organized to deal with fires and related emergencies that could occur. It consists of a fire brigade leader and a sufficient number of team members to be consistent with the equipment that must be put in service during a fire emergency. A sufficient number of trained and physically qualified fire brigade members are available on site during each shift. The fire brigade consists of at least five members on each shift. Members of the fire brigade are knowledgeable of building layout and system design. The assigned fire brigade members for any shift do not include the operations shift manager nor any other members of the minimum shift operating crew necessary for safe shutdown of the unit, nor do they include any other personnel required for other essential functions during a fire emergency. Fire brigade members for a shift are designated in accordance with

established procedures at the beginning of the shift. The fire brigade for Fermi 3 does include personnel assigned to Fermi 2.

13.1.3 Qualification Requirements of Nuclear Plant Personnel

13.1.3.1 Minimum Qualification Requirements

EF3 COL 13.1-1-A

Qualifications of managers, supervisors, operators, and technicians of the operating organization meet the requirements for education and experience described in ANSI/ANS-3.1 (Reference 13.1-201), as endorsed and amended by RG 1.8. For operators and SROs, these requirements are modified in Section 13.2.

13.1.3.2 Qualification Documentation

Resumes and other documentation of qualification and experience of initial appointees to appropriate management and supervisory positions are available for review by regulators upon request after position vacancies are filled.

13.1.4 COL Information

13.1-1-A Organizational Structure

EF3 COL 13.1-1-A

This COL item is addressed in Subsection 13.1.1 through Subsection 13.1.3.

13.1.5 References

13.1-201 American Nuclear Society, “American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plant,” ANSI/ANS -3.1.

13.1-202 U.S. Nuclear Regulatory Commission, “Generic Letter 86-04, Policy Letter, Engineering Expertise on Shift.”

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 1 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents*			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
Executive management	chief nuclear officer & senior executive, nuclear operations	(n/a)	Chief Nuclear Officer	1**	1**	1**	1**
	senior executive	(n/a)	Site Executive	1**	1**	1**	1**
Nuclear support	executive, construction	(n/a)	Major Enterprise Projects Executive	1**	1**	1**	
Plant management	plant manager	(4.2.1)	Plant Manager			1	1
Operations	manager	(4.2.2)	Manager, Operations			1	1
operations, plant	functional manager	(4.3.8)	Operations – Shift Supervisor			1	1
operations, admin	functional manager	(4.3.8)	Operations – Support Supervisor			1	1
operations, (on-shift)	functional manager	(4.4.1)	Shift Manager			6	6
	supervisor	(4.4.2)	Unit Supervisor			5	5
	supervisor	(4.4.2)	Supervisor, Work Control			5	5
	supervisor	(4.6.2)	STA****			5	5
	licensed operator	(4.5.1)	Control Room Operator			15	24
	non-licensed operator	(4.5.2)	Non-licensed Operator		6	24	30
	rad waste operator	(4.5.2)	Rad Waste Operator			1	2
Engineering	manager	(4.2.4)	Director, Nuclear Engineering	1	1	1	1
projects	functional manager	(4.3.9)	Manager, Projects		1	1	1
system engineering	functional manager	(4.3.9)	Supervisor, System Engineering		1	4	4

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 2 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents* Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	system engineer	(4.6.1)	System Engineer	1	4	16	16
design engineering	functional manager	(4.3.9)	Supervisor, Design Engineering	1	1	1	1
	design engineer	(4.6 – staff engineer)	Design Engineer	3	5	10	15
safety and engineering analysis	functional manager	(4.3.9)	Manager, Nuclear Safety Engineering		1	1	1
	analysis engineer	(4.6–staff engineer)	Analysis Engineer		1	1	1
engineering programs	functional manager	(4.3.9)	Manager, Engineering Programs		1	1	1
	programs engineer	(4.6–staff engineer)	Programs Engineer		6	12	12
reactor engineering	functional manager	(4.3.9)	Supervisor, Reactor Engineering			1	1
	reactor engineer	(4.6–staff engineer)	Reactor Engineer		1	3	3
Chemistry	functional manager	(4.3.2)	Manager, Radiation Protection & Chemistry		1***	1***	1***
	supervisor	(4.4.5)	Chemistry Supervisor		1	1	2
	technician	(4.5.3.1)	Chemistry Technician		2	6	10
Radiation Protection	functional manager	(4.3.3)	Manager, Radiation Protection & Chemistry		1***	1***	1***

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 3 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents*			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	supervisor	(4.4.6)	Health Physics Supervisor		2	6	8
	technician	(4.5.3.2)	Health Physics Technician		4	12	18
Maintenance	manager	(4.2.3)	Manager, Maintenance			1	1
instrumentation and control	supervisor	(4.4.7)	Supervisor, Instrumentation and Control		1	1	1
	supervisor	(4.4.7)	Assistant Supervisor, Instrumentation and Control		2	2	2
	technician	(4.5.3.3)	Instrumentation and Control Technician		4	20	30
mechanical	supervisor	(4.4.9)	Supervisor, Mechanical		1	1	1
	supervisor	(4.4.9)	Assistant Supervisor, Mechanical		2	2	2
	technician	(4.5.7.2)	Mechanic		4	20	30
electrical	supervisor	(4.4.8)	Supervisor, Electrical		1	1	1
	supervisor	(4.4.8)	Assistant Supervisor, Electrical		2	2	2
	technician	(4.5.7.1)	Electrician		4	20	30
Planning and scheduling and outage	manager	(4.2)	Manager, Outage & Planning			1***	1***
	functional manager	(4.3)	Supervisor, Outage & Planning			1	1
	functional manager	(4.3)	Supervisor, Scheduling			1	1

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 4 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)	Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents*			
			Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	functional manager (4.3)	Supervisor, Planning		1	1	1
Purchasing, and contracts	functional manager (4.3)	Manager, Supply Chain Services		1***	1***	1***
Quality assurance	functional manager (QAPD)	QA Manager	1***	1***	1***	1***
	QA lead auditor (QAPD)	QA Auditor	1	1	1	1
	QA internal auditor (QAPD)	QA Auditor		2	2	8***
	QC inspector (QAPD)	QC Inspector		6	6	4
	supplier auditor (QAPD)	Nuclear Quality Auditor		2	2	1***
	vendor surveillance QC inspector (QAPD)	Vendor Surveillance QC Inspector	2	6	4	4***
	nuclear fuel inspector (QAPD)	Nuclear Fuel Inspector		3***	3***	3***
Training	functional manager (4.3.1)	Manager, Training		1***	1***	1***
	supervisor operations training (4.4.4)	Supervisor, Operations Training		1	1	1
	supervisor, simulator (4.4.4)	Supervisor, Simulator & Training Support		1	1	1
	operations training instructor (4.5.4)	Operations Training Instructor		10	10	10
	supervisor tech staff training (4.4.4)	Supervisor, Tech Training		1	1	1
	supervisor maintenance training (4.4.4)	Supervisor, Maintenance Training		1	1	1

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 5 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents* Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	tech staff/maintenance instructor	(4.5.4)	Tech Staff/Maintenance Instructor		7	7	7
Nuclear safety assurance	manager	(4.2)	Director, Nuclear Safety & Licensing		1***	1***	1***
licensing	functional manager	(4.3)	Supervisor, Licensing	1	1	1	1
	licensing engineer	(n/a)	Licensing Engineer	4	4	4	2
corrective action	functional manager	(4.3)	Performance Improvement Manager		1***	1***	1***
	corrective action engineer	(n/a)	Station Nuclear Safety Engineer		1	1	1
Nuclear protection services							
fire protection	supervisor	(4.4)	Supervisor, Protection Services		1***	1***	1***
emergency preparedness	functional manager	(4.3)	Manager, Emergency Planning		1**	1**	1**
	EP planner	(n/a)	EP Specialist		2***	2***	2***
security	functional manager	(4.3)	Manager, Security		1***	1***	1***
	first line supervisor	(4.4)	Supervisor, Nuclear Security		10***	10***	10***
	security officer	(n/a)	Security Officer		100***	100***	100***
Startup testing	supervisor	(4.4.12)	Startup Testing Supervisor		1	3	1
	startup test engineer		Startup Test Engineer		24	10	4

Table 13.1-201 Generic Position/Site Specific Position Cross Reference (Sheet 6 of 6) [EF3 COL 13.1-1-A]

Nuclear Function	Function Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents* Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	supervisor	(4.4.11)	Preop Testing Supervisor		2	2	-
	preop test engineer	(n/a)	Preop Test Engineer		8	8	-

Notes:

* Unless otherwise noted, the number in each block represents the estimated number of full time equivalents dedicated to the project.

** The number in this block indicates total positions in the nuclear organization.

*** Shared position with other Fermi units.

**** A senior reactor operator on shift who meets the qualifications for the combined SRO/STA position specified for Option 1 of Generic Letter 86-04 (Reference 13.1-202) may also serve as the STA. If this option is used for a shift, the separate STA position may be eliminated for that shift.

Table 13.1-202 Minimum Shift Staffing [EF3 COL 13.1-1-A]

Unit Shutdown	1 SM (SRO)
	1 RO
	1 NLO
Unit Operating*	1 SM (SRO)
	1 SRO
	2 RO
	2 NLO

SM – Shift Manager	RO – Licensed Reactor Operator
SRO – Licensed Senior Reactor Operator	NLO – Non-Licensed Operator

Notes:

In addition, one Shift Technical Advisor (STA) is assigned during plant operation in modes other than cold shutdown or refueling. A shift manager or another SRO on shift, who meets the qualifications for the combined Senior Reactor Operator/Shift Technical Advisor (SRO/STA) position, as specified for option 1 of Generic Letter 86-04 (Reference 13.1-202), the commission's policy statement on engineering expertise on shift, may also serve as the STA. If this option is used for a shift, then the separate STA position may be eliminated for that shift. In addition to the minimum shift organization above, during refueling a licensed senior reactor operator or senior reactor operator limited (fuel handling only) is required to directly supervise any core alteration activity.

A shift manager/supervisor (licensed SRO), is on site at all times when fuel is in the reactor.

A health physics technician is on site at all times where there is fuel in the reactor.

A chemistry technician is on site during plant operation in modes other than cold shutdown or refueling.

* Operating modes other than cold shutdown or refueling.

Figure 13.1-201 Construction Organization

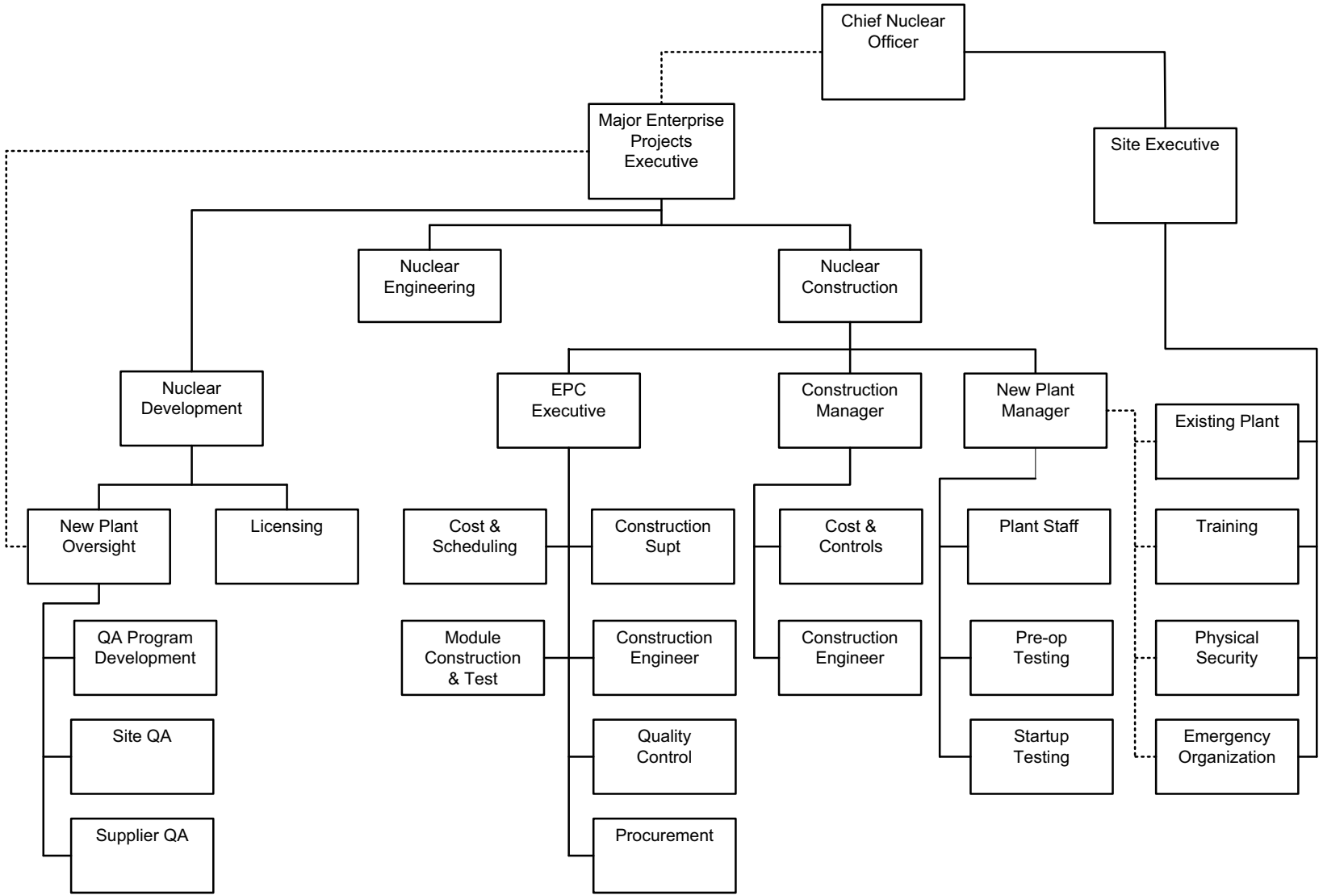


Figure 13.1-202 Nominal Plant Staff Hiring and Training Schedule

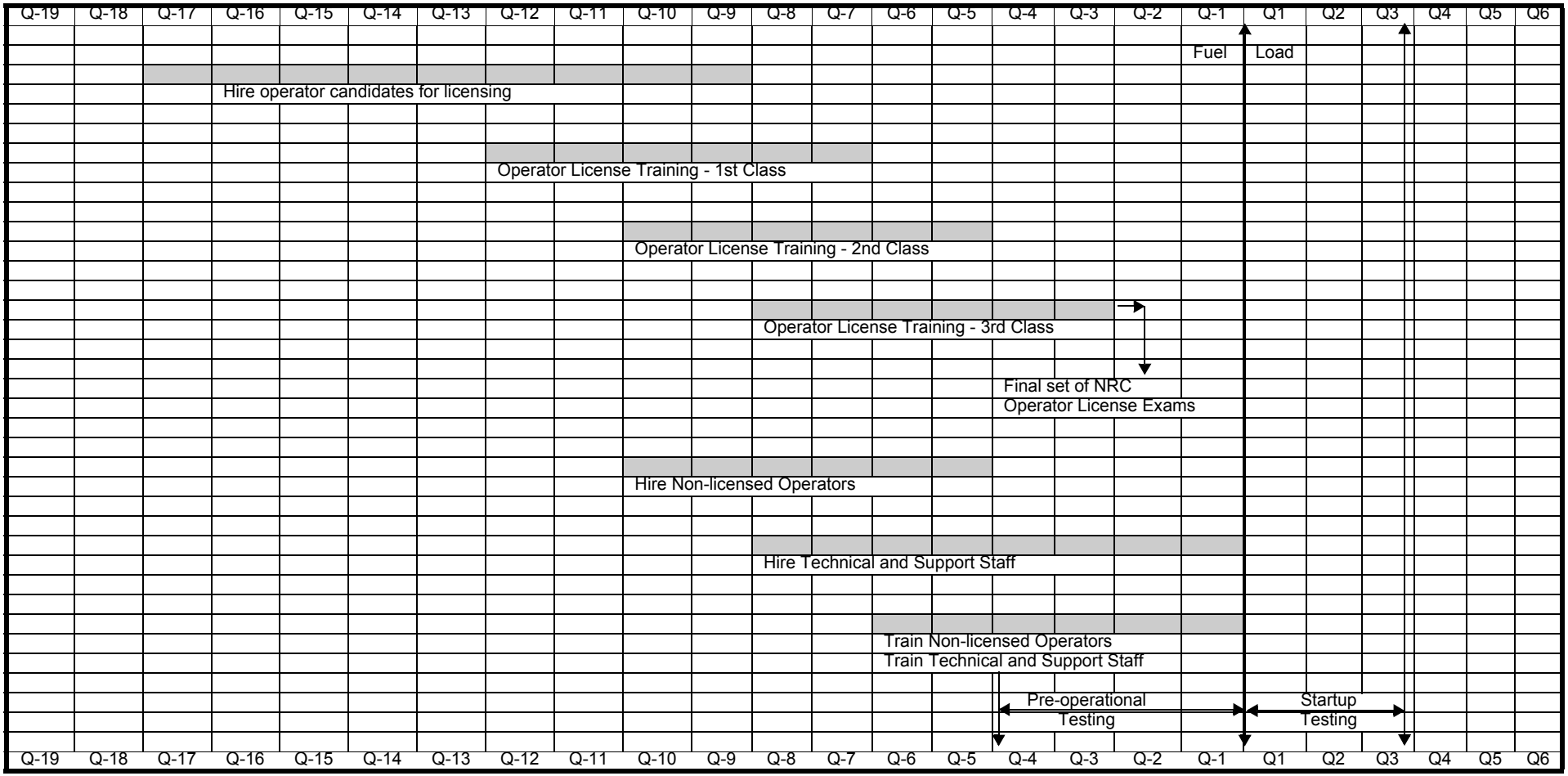
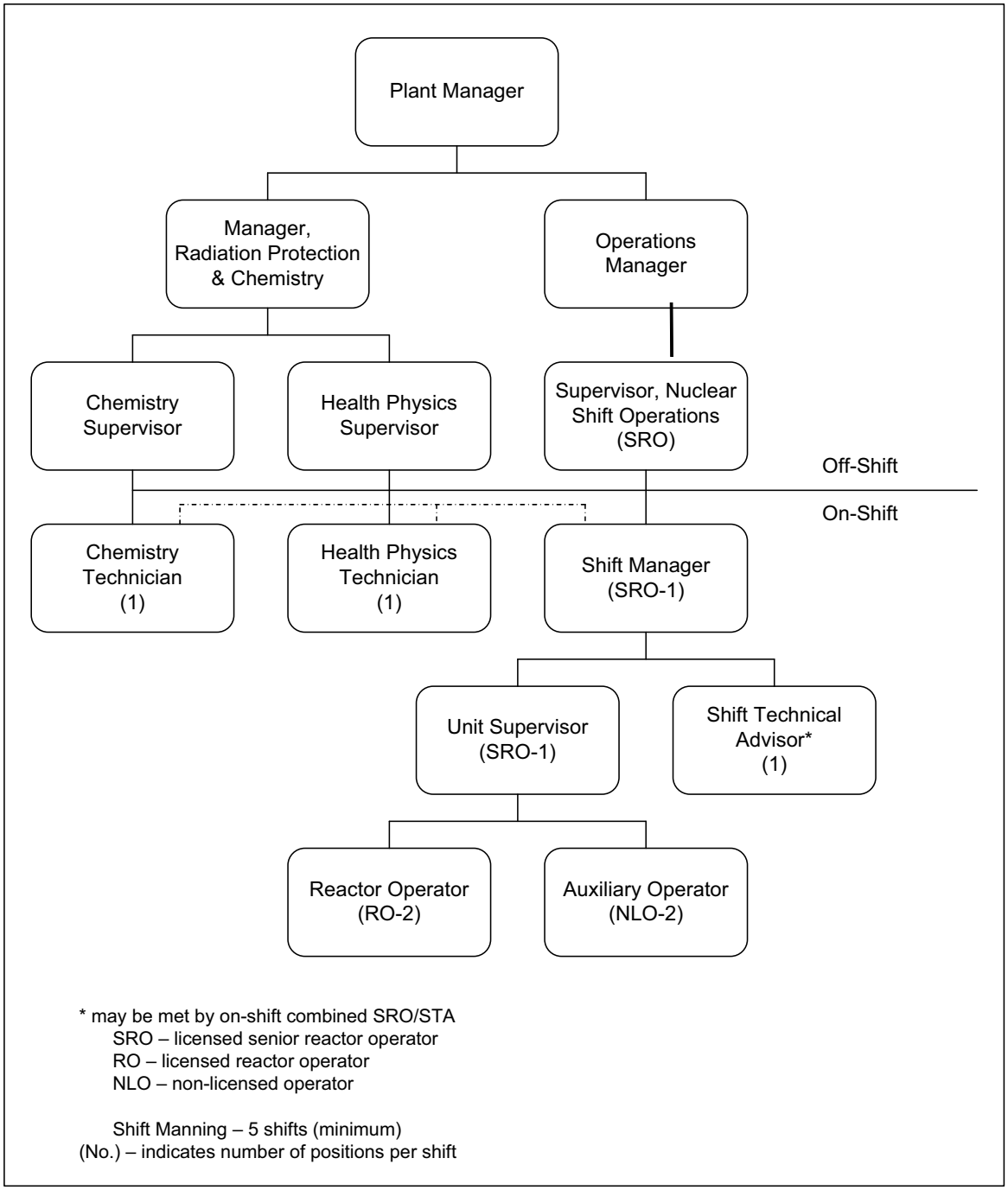


Figure 13.1-203 Shift Operations



13.2 Training

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Add the following as introductory material under Section 13.2:

STD SUP 13.2-1

Training programs are addressed in Appendix 13BB. Implementation milestones are addressed in Section 13.4.

13.2.1 Reactor Operator Training

Replace the second sentence of the second paragraph with the following:

STD COL 13.2-1-A

Descriptions of the training program and licensed operator requalification program for reactor operators and senior reactor operators are addressed in Appendix 13BB. A schedule showing approximate timing of initial licensed operator training relative to fuel loading is addressed in Section 13.1. Requalification training is implemented in accordance with Section 13.4.

13.2.2 Training for Non-Licensed Plant Staff

Replace the second sentence of the second paragraph with the following:

STD COL 13.2-2-A

A description of the training program for non-licensed plant staff is addressed in Appendix 13BB. A schedule showing approximate timing of initial training for non-licensed plant staff relative to fuel load is addressed in Section 13.1.

13.2.5 COL Information

13.2-1-A Reactor Operator Training

STD COL 13.2-1-A

This COL item is addressed in Subsection 13.2.1 and Appendix 13BB.

13.2-2-A Training for Non-Licensed Plant Staff

STD COL 13.2-2-A

This COL item is addressed in Subsection 13.2.2 and Appendix 13BB.

13.3 Emergency Planning

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Replace the fifth and sixth paragraphs with the following:

STD COL 13.3-1-A

As addressed in the emergency plan, the TSC is provided with reliable voice and data communication with the MCR and Emergency Operations Facility (EOF) and reliable voice communications with the Operational Support Center (OSC), NRC, and state and local operations centers.

The OSC communications system has at least one dedicated telephone extension to the control room, and one dedicated telephone extension to the TSC, and one telephone capable of reaching on-site and off-site locations, as a minimum.

Replace the second sentence in the seventh paragraph with the following.

STD COL 13.3-3-A

Supplies are provided in the service building adjacent to the main change rooms for decontamination of on-site individuals.

13.3.2 Emergency Plan

STD COL 13.3-1-A
STD COL 13.3-2-A
STD COL 13.3-3-A

The emergency plan, prepared in accordance with 10 CFR 52.79(d), is maintained as a separate document.

13.3.3 COL Information

13.3-1-A Identification of OSC and Communication Interfaces With Control Room and TSC

STD COL 13.3-1-A

This COL Item is addressed in Section 13.3 and in Emergency Plan Sections II-F and II-H.

13.3-2-A Identification of EOF and Communication Interfaces with Control Room and TSC

STD COL 13.3-2-A

This COL item is addressed in Section 13.3 and in Emergency Plan Sections II-F and II-H.

13.3-3-A **Decontamination Facilities**

STD COL 13.3-3-A This COL item is addressed in Section 13.3 and in Emergency Plan Section II-J.

13.4 Operational Program Implementation

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

Replace this section with the following.

STD COL 13.4-1-A
STD COL 13.4-2-A Table 13.4-201 lists each operational program, the regulatory source for the program, the associated implementation milestone(s), and the section of the FSAR in which the operational program is fully described as required by RG 1.206, Combined License Applications for Nuclear Power Plants (LWR edition).

13.4.1 COL Information

13.4-1-A **Operation Programs**

STD COL 13.4-1-A This COL item is addressed in Section 13.4.

13.4-2-A **Implementation Milestones**

STD COL 13.4-2-A This COL item is addressed in Section 13.4.

13.4.2 References

13.4-201 American Society of Mechanical Engineers (ASME), “Boiler and Pressure Vessel Code (B&PVC), Rules for Inservice Inspection of Nuclear Power Plant Components,” BPVC Section XI.

13.4-202 American Society of Mechanical Engineers (ASME), “Code for the Operation and Maintenance of Nuclear Power Plants,” OM Code.

Table 13.4-201 Operational Programs Required by NRC Regulations (Sheet 1 of 5) [STD COL 13.4-1-A] [STD COL 13.4-2-A]

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	Requirement
1.	Inservice Inspection Program	10 CFR 50.55a(g)	5.2.4 6.6 DCD 3.8.1.7.3 3.9.3.7.1(3)e	Prior to commercial service	10 CFR 50.55a(g); ASME XI IWA 2430(b) (Reference 13.4-201) **[COM 13.4-024]**
2.	Inservice Testing Program	10 CFR 50.55a(f)	3.9.6 5.2.4 6.6 3.9.3.7.1(3)e	After generator online on nuclear heat	10 CFR 50.55a(f); ASME OM Code (Reference 13.4-202) **[COM 13.4-025]**
3.	Environmental Qualification Program	10 CFR 50.49(a)	3.11	Prior to fuel load	License Condition **[COM 13.4-001]**
4.	Preservice Inspection Program	10 CFR 50.55a(g)	5.2.4 6.6 DCD 3.8.1.7.3 3.9.3.7.1(3)e	Completion prior to initial plant startup	10 CFR 50.55a(g); ASME Code Section XI IWB/IWC/IWD-2200(a) (Reference 13.4-201) **[COM 13.4-026]**
5.	Reactor Vessel Material Surveillance Program	10 CFR 50.60 10 CFR 50, Appendix H	DCD 5.3.1	Prior to fuel load	License Condition **[COM 13.4-002]**
6.	Preservice Testing Program	10 CFR 50.55a(f)	3.9.6 5.2.4 3.9.3.7.1(3)e	Prior to fuel load	License Condition **[COM 13.4-003]**
7.	Containment Leakage Rate Testing Program	10 CFR 50.54(o) 10 CFR 50, Appendix J	DCD 6.2.6	Prior to fuel load	10 CFR 50, Appendix J Option B – Section III.a **[COM 13.4-004]**

Table 13.4-201 Operational Programs Required by NRC Regulations (Sheet 2 of 5) [STD COL 13.4-1-A] [STD COL 13.4-2-A]

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	Requirement
8.	Fire Protection Program	10 CFR 50.48	9.5.1.15	Prior to fuel receipt for elements of the Fire Protection Program necessary to support receipt and storage of fuel onsite. Prior to fuel load for elements of the Fire Protection Program necessary to support fuel load and plant operation.	License Condition **[COM 13.4-005]** **[COM 13.4-006]**
9.	Process and Effluent Monitoring and Sampling Program:				
	Radiological Effluent	10 CFR 20.1301 and 20.1302	11.5.4.6	Prior to fuel load	License Condition **[COM 13.4-007]**
	Technical	10 CFR 50.34a			
	Specifications/Standard	10 CFR 50.36a			
	Radiological Effluent Controls	10 CFR 50, Appendix I, Section II and IV			
	Offsite Dose Calculation Manual	Same as above	11.5.4.5 11.5.4.8	Prior to fuel load	License Condition **[COM 13.4-009]**
	Radiological Environmental Monitoring Program	Same as above	11.5.4.5	Prior to fuel load	License Condition **[COM 13.4-010]**
	Process Control Program	10 CFR 20.1301 and 20.1302 10 CFR 50.34a 10 CFR 61.55 and 61.56 10 CFR 71	11.4.2.3	Prior to fuel load	License Condition **[COM 13.4-011]**

Table 13.4-201 Operational Programs Required by NRC Regulations (Sheet 3 of 5) [STD COL 13.4-1-A] [STD COL 13.4-2-A]

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	**Requirement**
10.	Radiation Protection Program	10 CFR 20.1101	12.5	Prior to initial receipt of by-product, source, or special nuclear materials (excluding Exempt Quantities as described in 10 CFR 30.18) for those elements of the Radiation Protection (RP) Program necessary to support such receipt	License Condition **[COM 13.4-012]**
				Prior to fuel receipt for those elements of the RP Program necessary to support receipt and storage of fuel onsite	**[COM 13.4-013]**
				Prior to fuel load for those elements of the RP Program necessary to support fuel load and plant operation	**[COM 13.4-014]**
				Prior to first shipment of radioactive waste for those elements of the RP Program necessary to support shipment of radioactive waste	**[COM 13.4-015]**
11.	Non Licensed Plant Staff Training Program	10 CFR 50.120	13.2.2	18 months prior to scheduled fuel load	10 CFR 50.120(b)
12.	Reactor Operator Training Program	10 CFR 55.13 10 CFR 55.31 10 CFR 55.41 10 CFR 55.43 10 CFR 55.45	13.2.1	18 months prior to scheduled fuel load	License Condition **[COM 13.4-016]**

Table 13.4-201 Operational Programs Required by NRC Regulations (Sheet 4 of 5) [STD COL 13.4-1-A] [STD COL 13.4-2-A]

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	**Requirement**
13.	Reactor Operator Requalification Program	10 CFR 50.34(b) 10 CFR 50.54(i) 10 CFR 55.59	13.2	Within 3 months after issuance of an operating license or the date the Commission makes the finding under 10 CFR 52.103(g)	10 CFR 50.54(i-1)
14.	Emergency Planning	10 CFR 50.47 10 CFR 50, Appendix E	13.3	Full participation exercise conducted within 2 years prior to scheduled date for initial loading of fuel	10 CFR Part 50, Appendix E, Section IV.F.2.a(ii)
				Onsite exercise conducted within 1 year prior to the schedule date for initial loading of fuel	10 CFR 50, Appendix E, Section IV.F.2.a(ii)
				Applicant's detailed implementing procedures for its emergency plan submitted at least 180 days prior to scheduled date for initial loading of fuel	10 CFR 50, Appendix E, Section V
15.	Security Program:	10 CFR 50.34(c)	13.6	Prior to fuel receipt	License Condition **[COM 13.4-017]**
	Physical Security Program	10 CFR 73.55 10 CFR 73.56 10 CFR 73.57			
	Safeguards Contingency Program	10 CFR 50.34(d) 10 CFR 73, Appendix C	13.6	Prior to fuel receipt	License Condition **[COM 13.4-017]**
	Training and Qualification Program	10 CFR 73, Appendix B	13.6	Prior to fuel receipt	License Condition **[COM 13.4-017]**

Table 13.4-201 Operational Programs Required by NRC Regulations (Sheet 5 of 5) [STD COL 13.4-1-A] [STD COL 13.4-2-A]

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	**Requirement**
	Fitness for Duty (Construction – Mgt & Oversight personnel)	10 CFR 26, Subparts A-H, N, and O	13.7	Prior to on-site construction of safety- or security-related SSCs	License Condition **[COM 13.4-018]**
	Fitness for Duty (Construction – Workers & First Line Supv.)	10 CFR 26 Subpart K	13.7	Prior to on-site construction of safety- or security-related SSCs	License Condition **[COM 13.4-018]**
	Fitness for Duty (Operation)	10 CFR 26	13.7	Prior to fuel receipt	License Condition **[COM 13.4-019]**
16.	Quality Assurance Program – Operation	10 CFR 50.54(a) 10 CFR 50, Appendix A (GDC 1) 10 CFR 50, Appendix B	17.5	30 days prior to scheduled date for initial loading of fuel	10 CFR 50.54(a)(1)
17.	Maintenance Rule	10 CFR 50.65	17.6	Prior to fuel load authorization per 10 CFR 52.103(g)	10 CFR 50.65(a)(1) **[COM 13.4-008]**
18.	Motor-Operated Valve Testing	10 CFR 50.55a(b)(3)(ii)	3.9.6	Prior to fuel load	License Condition **[COM 13.4-020]**
19.	Initial Test Program	10 CFR 50.34 10 CFR 52.79(a)(28)	14.2	Prior to the first construction test being conducted for the Construction Test Program	License Condition **[COM 13.4-021]**
				60 days prior to the scheduled date of the first preoperational test for the Preoperational Test Program	**[COM 13.4-022]**
				60 days prior to the scheduled date of initial fuel loading for the Startup Test Program	**[COM 13.4-023]**

13.5 Plant Procedures

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

STD SUP 13.5-1 This section describes the administrative and operating procedures that the operating organization (plant staff) uses to conduct routine operating, abnormal, and emergency activities in a safe manner.

STD SUP 13.5-2 The QAPD describes procedural document control, record retention, adherence, assignment of responsibilities, and changes.

STD SUP 13.5-3 Procedures are identified in this section by topic, type, or classification in lieu of the specific title, and represent general areas of procedural coverage.

STD SUP 13.5-4 **[START COM 13.5-001]** Procedures are developed prior to fuel load to allow sufficient time for plant staff familiarization and to allow NRC staff adequate time to review the procedures and to develop operator licensing examinations. **[END COM 13.5-001]**

STD COL 13.5-4-A Industry guidance for the appropriate format, content, and typical activities delineated in written procedures is implemented, as appropriate. Guidance is based on ASME NQA-1, “Quality Assurance Requirements for Nuclear Facility Applications” (Reference 13.5-202).

STD SUP 13.5-5 The format and content of procedures are controlled by administrative procedure(s). Procedures are organized to include the following components, as necessary:

- Title Page
- Table of Contents
- Scope and Applicability
- Responsibilities
- Prerequisites

- Precautions and Limitations
- Main Body
- Acceptance Criteria
- Check-off Lists
- References
- Attachments and Data Sheets

STD SUP 13.5-6

Each procedure is sufficiently detailed for an individual to perform the required function without direct supervision, but does not provide a complete description of the system or plant process. The level of detail contained in the procedure is commensurate with the qualifications of the individual normally performing the function.

STD SUP 13.5-7

Procedures are developed consistent with guidance described in DCD Section 18.9, Procedure Development, and with input from the human factors engineering process and evaluations.

The bases for procedure development include:

- Plant design bases
- System-based technical requirements and specifications
- Task analyses results
- Risk-important human actions identified in the HRA/PRA
- Initiating events considered in the Emergency Operating Procedures (EOPs), including those events in the design bases
- Generic Technical Guidelines (GTGs) for EOPs

Procedure verification and validation includes the following activities, as appropriate:

- A review to verify they are correct and can be carried out.
- A final validation in a simulation of the integrated system as part of the verification and validation activities as described in DCD Section 18.11, Human Factors Verification and Validation.
- A verification of modified procedures for adequate content, format, and integration. The procedures are assessed through validation if a modification substantially changes personnel tasks that are significant to plant safety. The validation verifies that the procedures correctly

reflect the characteristics of the modified plant and can be performed effectively to restore the plant.

STD SUP 13.5-8

Procedures for shutdown management are developed consistent with the guidance described in NUMARC 91-06, “Guidelines for Industry Actions to Assess Shutdown Management,” to reduce the potential for loss of reactor coolant system (RCS) boundary and inventory during shutdown conditions. (Reference 13.5-203)

13.5.1 Administrative Procedures

Replace the first sentence of the first paragraph with the following:

STD SUP 13.5-9

This section describes administrative procedures that provide administrative control over activities that are important to safety for the operation of the facility.

Replace the second paragraph with the following:

STD COL 13.5-1-A

Administrative procedures are developed in accordance with the nominal schedule presented in Table 13.5-202.

STD SUP 13.5-10

Procedures outline the essential elements of the administrative programs and controls as described in ASME NQA-1 and Section 17.5. These procedures are organized such that the program elements are prescribed in documents normally referred to as administrative procedures.

Administrative procedures contain adequate programmatic controls to provide effective interface between organizational elements. This includes contractor and owner organizations providing support to the station operating organization.

STD SUP 13.5-11

Procedure control is discussed in the QAPD. Type and content of procedures are discussed throughout Section 13.5.

STD SUP 13.5-12

A procedure style (writer’s) guide promotes the standardization and application of human factors engineering principles to procedures. The

writer's guide establishes the process for developing procedures that are complete, accurate, consistent, and easy to understand and follow. The guide provides objective criteria so that procedures are consistent in organization, style, and content. The writer's guide includes criteria for procedure content and format including the writing of action steps and the specification of acceptable acronym lists and acceptable terms to be used.

STD SUP 13.5-13 Procedure maintenance and control of procedure updates are performed in accordance with the QAPD.

STD SUP 13.5-14 The administrative programs and associated procedures developed in the pre-COL phase are described in Table 13.5-201 (for future designation as historical information).

STD SUP 13.5-15 13.5.1.1 **Administrative Procedures-General**

This section describes those procedures that provide administrative controls with respect to procedures, including those that define and provide controls for operational activities of the plant staff.

STD SUP 13.5-16 Plant administrative procedures provide procedural instructions for the following:

- Procedures review and approval
- Procedure adherence
- Scheduling for surveillance tests and calibration
- Log entries
- Record retention
- Containment access
- Bypass of safety function and jumper control
- Communication systems
- Equipment control procedures - These procedures provide for control of equipment, as necessary, to maintain personnel and reactor safety, and to avoid unauthorized operation of equipment
- Control of maintenance and modifications

- Fire Protection Program procedures
- Crane Operation Procedures - Crane operators who operate cranes over fuel pools are qualified and conduct themselves in accordance with ANSI B30.2 (Chapter 2-3), “Overhead and Gantry Cranes” (Reference 13.5-201).
- Temporary changes to procedures
- Temporary procedure issuance and control
- Special orders of a temporary or self-canceling nature
- Standing orders to shift personnel including the authority and responsibility of the shift manager, senior reactor operator in the control room, control room operator, and shift technical advisor
- Manipulation of controls and assignment of shift personnel to duty stations per the requirements of 10 CFR 50.54 (i), (j), (k), (l), and (m) including delineation of the space designated for the “At the Controls” area of the Control Room
- Shift relief and turnover procedures
- Fitness for Duty
- Control Room access
- Working hour limitations
- Feedback of design, construction, and applicable important industry and operating experience
- Shift Manager administrative duties
- Verification of correct performance of operational activities
- A vendor interface program that provides vendor information for safety related components is incorporated into plant documentation

STD SUP 13.5-17 13.5.2 **Operating and Maintenance Procedures**

Replace the third paragraph with the following:

STD COL 13.5-2-A Operating Procedures are developed in accordance with Subsection 13.5.2.1 and Maintenance Procedures are developed in accordance with Subsection 13.5.2.2.6.1.

Replace the fifth paragraph with the following:

STD COL 13.5-4-A

A Plant Operations Procedures Development Plan is established in accordance with Subsection 13.5.2.1.

Replace the second sentence of “Procedures for Calibration, Inspection and Testing” with the following:

STD COL 13.5-6-H

Surveillance procedures that cover safety-related logic circuitry are addressed in Subsection 13.5.2.2.6.3.

Replace the second paragraph with the heading “Procedures for Handling of Heavy Loads” with the following:

STD COL 13.5-5-A

The scope of procedures in the Plant Operating Procedures Development Plan is addressed in Subsection 13.5.2.1.

Replace the last sentence of Subsection 13.5.2 with the following:

STD COL 13.5-3-A

Emergency Procedures are developed in accordance with Subsection 13.5.2.1.4.

Add the following at the end of Subsection 13.5.2.

STD COL 13.5-2-A

13.5.2.1 **Operating and Emergency Operating Procedures**

This section describes the operating procedures used by the operating organization (plant staff) to conduct routine operating, abnormal, and emergency activities in a safe manner.

[START COM 13.5-002] Operating procedures are developed at least six months prior to fuel load to allow sufficient time for plant staff familiarization and to allow NRC staff adequate time to review the procedures and to develop operator licensing examinations. **[END COM 13.5-002]**

STD SUP 13.5-18

The classifications of operating procedures are:

- System Operating Procedures

- General Operating Procedures
- Abnormal (Off-Normal) Operating Procedures
- Emergency Operating Procedures
- Alarm Response Procedures

STD COL 13.5-2-A The Plant Operating Procedures Development Plan establishes:

- A scope that includes those operating procedures defined below, which direct operator actions during normal, abnormal, and emergency operations, and considers plant operations during periods when plant systems/equipment are undergoing test, maintenance, or inspection.
- The methods and criteria for the development, verification and validation, implementation, maintenance, and revision of procedures. The methods and criteria are in accordance with NUREG-0737 TMI Items I.C.1 and I.C.9.

STD COL 13.5-5-A The following procedures are included in the scope of the Plant Operating Procedures Development Plan:

- System operating procedures
- General operating procedures
- Abnormal (off-normal) or alarm response procedures
- Procedures for combating emergencies and other significant events
- Procedures for maintenance and modification
- Procedures for radiation monitoring and control
- Fuel handling procedures
- Temporary procedures
- Procedures for handling of heavy loads

STD COL 13.5-5-A
STD COL 13.5-6-H

- Procedures for calibration, inspection, and testing

STD COL 13.5-4-A Implementation of the Plant Operating Procedures Development Plan establishes:

- Procedures that are consistent with the requirements of 10 CFR 50 and the TMI requirements in NUREG-0737 and Supplement 1 to NUREG-0737
- Requirements that the procedures developed include, as necessary, the elements described in the QAPD
- Bases for specifying plant operating procedures including:
  - Operator actions identified in the vendor's task analysis and PRA efforts in support of the design certification
  - Standardized plant emergency procedure guidelines
  - Consideration of plant-specific equipment selection and site specific elements such as the station water intake structure and the ultimate heat sink
- The definition of the methods through which specific operator skills and training needs, as may be considered necessary for reliable execution of the procedures, are identified and documented
- Requirements that the procedures specified above are made available for the purposes of the Human Factors V&V Implementation Plan described in GE Report NEDO-33276, ESBWR Verification & Validation Implementation Plan (DCD Reference 13.5-1)
- Procedures for the incorporation of the results of operating experience and the feedback of pertinent information into plant procedures in accordance with the provisions of TMI Item I.C.5 (NUREG-0737)

STD SUP 13.5-19

13.5.2.1.1 **System Operating Procedures**

Instructions for energizing, filling, venting, draining, starting up, shutting down, changing modes of operation, returning to service following testing or maintenance (if not contained in the applicable procedure), and other instructions appropriate for operation of systems are delineated in system procedures.

System procedures contain check-off lists, where appropriate, which are prepared in sufficient detail to provide an adequate verification of the status of the system.

STD SUP 13.5-20

13.5.2.1.2 **General Operating Procedures**

General operating procedures provide instructions for performing integrated plant operations involving multiple systems such as plant startup and shutdown. These procedures provide a coordinated means of integrating procedures together to change the mode of plant operation or achieve a major plant evolution. Check-off lists are used for the purpose of confirming completion of major steps in proper sequence.

Typical types of general operating procedures are described as follows:

- Startup procedures provide instruction for starting the reactor from cold or hot conditions, establishing power operation, and recovery from reactor trips
- Shutdown procedures guide operations during and following controlled shutdown or reactor trips, and include instructions for establishing or maintaining hot standby and safe or cold shutdown conditions, as applicable
- Power operation and load changing procedures provide instruction for steady-state power operation and load changing

STD SUP 13.5-21

13.5.2.1.3 **Abnormal (Off-Normal) Operating Procedures**

Abnormal operating procedures for correcting abnormal conditions are developed for those events where system complexity might lead to operator uncertainty. Abnormal operating procedures describe actions to be taken during other than routine operations, which if continued, could lead to either material failure, personnel harm, or other unsafe conditions.

Abnormal procedures are written so that a trained operator knows in advance the expected course of events or indications that identify an abnormal situation and the immediate action to be taken.

STD SUP 13.5-22

13.5.2.1.4 **Emergency Operating Procedures**

EOPs are procedures that direct actions necessary for the operators to mitigate the consequences of transients and accidents that cause plant parameters to exceed reactor protection system or ESF actuation setpoints.

Emergency operating procedures include appropriate guidance for the operation of plant post-72-hour equipment, and are developed as appropriate per the guidance of:

- NUREG-0737, “Clarification of TMI Action Plan Requirements,” Items I.C.1 and I.C.9
- The QAPD

STD COL 13.5-3-A

The emergency operating procedure program (e.g., the procedures generation package (PGP)) describes the objectives of the emergency procedure development process, the program for developing EOPs and the required content of the EOPs.

[START COM 13.5-003] The procedure development program, as described in the PGP for EOPs, is submitted to the NRC at least three months prior to the planned date to begin formal operator training on the EOPs. **[END COM 13.5-003]** The PGP includes:

- GTGs, which are guidelines based on analysis of transients and accidents that are specific to the plant design and operating philosophy. The submitted documentation includes: a) identification of significant deviations from the generic guidelines (including identification of additional equipment beyond that identified in the generic guidelines), along with necessary engineering evaluations or analyses to support the adequacy of each deviation, and b) a description of the process used for identifying operator information and control requirements.
- A generic writer’s guide (GWG) that details the specific methods used in preparing EOPs based on GTGs. The writer’s guide contains objective criteria that require that the emergency procedures developed are consistent in organization, style, content, and usage of terms.
- A description of the program for verification and validation (V&V) of EOPs.
- A description of the program for training operators on EOPs.
- The objectives of the emergency procedure development.
- Discussion of any design change recommendations and/or negative implications that the current design may have on safe operation as

noted during implementation of the emergency procedures development plan.

STD SUP 13.5-23

13.5.2.1.5 **Alarm Response Procedures**

Procedures are provided for annunciators (alarm signals) identifying the proper operator response actions to be taken. Each of these procedures normally contains: a) the meaning of the annunciator or alarm, b) the source of the signal, c) any automatic plant responses, d) any immediate operator action, and e) the long range actions. When corrective actions are very detailed and/or lengthy, the alarm response may refer to another procedure.

STD SUP 13.5-24

13.5.2.1.6 **Temporary Procedures**

Temporary procedures are issued during the operational phase only when permanent procedures do not exist for the following activities: to direct operations during testing, refueling, maintenance, and modifications; to provide guidance in unusual situations not within the scope of the normal procedures; and to provide orderly and uniform operations for short periods when the plant, a system, or a component of a system is performing in a manner not covered by existing detailed procedures, or has been modified or extended in such a manner that portions of existing procedures do not apply.

Temporary operating procedures are developed under established administrative guidelines. They include designation of the period of time during which they may be used and adhere to the QAPD and Technical Specifications, as applicable.

STD SUP 13.5-25

13.5.2.1.7 **Fuel Handling Procedures**

Fuel handling operations, including fuel receipt, identification, movement, storage, and shipment, are performed in accordance with written procedures. Fuel handling procedures address, for example, the status of plant systems required for refueling; inspection of replacement fuel and control rods; designation of proper tools; proper conditions for spent fuel movement and storage; proper conditions to prevent inadvertent criticality; proper conditions for fuel cask loading and movement; and status of interlocks, reactor trip circuits, and mode switches. These

procedures provide instructions for use of refueling equipment, actions for core alterations, monitoring core criticality status, accountability of fuel, and partial or complete refueling operations.

STD SUP 13.5-26

13.5.2.2 **Maintenance and Other Operating Procedures**

The QAPD provides guidance for procedural adherence.

STD SUP 13.5-27

13.5.2.2.1 **Plant Radiation Protection Procedures**

The plant radiation protection program is contained in procedures. Procedures are developed and implemented for such things as: maintaining personnel exposures, plant contamination levels, and plant effluents ALARA; monitoring both external and internal exposures of workers, considering industry-accepted techniques; performing routine radiation surveys; performing environmental monitoring in the vicinity of the plant; monitoring radiation levels during maintenance and special work activities; evaluating radiation protection implications of proposed modifications; and maintaining radiation exposure records of workers and others.

STD SUP 13.5-28

13.5.2.2.2 **Emergency Preparedness Procedures**

A discussion of emergency preparedness procedures can be found in the Emergency Plan. A list of implementing procedures is maintained in the Emergency Plan.

STD SUP 13.5-29

13.5.2.2.3 **Instrument Calibration and Test Procedures**

The QAPD provides a description of procedural requirements for instrumentation calibration and testing.

STD SUP 13.5-30

13.5.2.2.4 **Chemistry Procedures**

Procedures provided for chemical and radiochemical control activities include the nature and frequency of sampling and analyses; instructions for maintaining fluid quality within prescribed limits; the use of control and diagnostic parameters; and limitations on concentrations of agents that could cause corrosive attack, foul heat transfer surfaces or become sources of radiation hazards due to activation.

Procedures are also provided for the control, treatment, and management of radioactive wastes and control of radioactive calibration sources.

STD SUP 13.5-31

13.5.2.2.5 **Radioactive Waste Management Procedures**

Procedures for the operation of the radwaste processing systems provide for the control, treatment, and management of on-site radioactive wastes. These procedures are addressed in Subsection 13.5.2.1.1, System Operating Procedures.

STD SUP 13.5-32

13.5.2.2.6 **Maintenance, Inspection, Surveillance, and Modification Procedures**

13.5.2.2.6.1 **Maintenance Procedures**

Maintenance procedures describe maintenance planning and preparation activities. Maintenance procedures are developed considering the potential impact on the safety of the plant, license limits, availability of equipment required to be operable, and possible safety consequences of concurrent or sequential maintenance, testing, or operating activities.

Maintenance procedures contain sufficient detail to permit the maintenance work to be performed correctly and safely. Procedures include provisions for conducting and recording results of required tests and inspections, if not performed and documented under separate test and inspection procedures. References are made to vendor manuals, plant procedures, drawings, and other sources, as applicable.

Instructions are included, or referenced, for returning the equipment to its normal operating status. Testing is commensurate with the maintenance that has been performed. Testing may be included in the maintenance procedure or be covered in a separate procedure.

Where appropriate sections of related documents, such as vendor manuals, equipment operating and maintenance instructions, or approved drawings with acceptance criteria, provide adequate instructions to provide the required quality of work, the applicable sections of the related documents are referenced in the procedure, or may, in some cases, constitute adequate procedures in themselves.

Such documents receive the same level of review and approval as maintenance documents.

The preventive maintenance program, including preventive and predictive procedures, as appropriate, prescribes the frequency and type of maintenance to be performed. **[START COM 13.5-004]** An initial program based on service conditions, experience with comparable equipment and vendor recommendations is developed prior to fuel loading. **[END COM 13.5-004]** The program is revised and updated as experience is gained with the equipment. To facilitate this, equipment history files are created and maintained. The files are organized to provide complete and easily retrievable equipment history.

STD SUP 13.5-33

13.5.2.2.6.2 **Inspection Procedures**

The QAPD provides a description of procedural requirements for inspections.

13.5.2.2.6.3 **Surveillance Testing Procedures**

The QAPD provides a description of procedural requirements for surveillance testing. Surveillance testing procedures are written in a manner that adequately tests all portions of safety-related logic circuitry as described in Generic Letter 96-01, “Testing of Safety Related Logic Circuits.”

STD SUP 13.5-34

13.5.2.2.6.4 **Modification Procedures**

Plant modifications and changes to setpoints are developed in accordance with approved procedures. These procedures control necessary activities associated with the modifications such that they are carried out in a planned, controlled, and orderly manner. For each modification, design documents such as drawings, equipment and material specifications, and appropriate design analyses are developed, or the as-built design documents are utilized. Separate reviews are conducted by individuals knowledgeable in both technical and QA requirements to verify the adequacy of the design effort.

Proposed modifications that involve a license amendment or a change to Technical Specifications are processed as proposed license amendment request.

Plant procedures impacted by modifications are changed to reflect revised plant conditions prior to declaring the system operable and cognizant personnel who are responsible for operating and maintaining the modified equipment are adequately trained.

STD SUP 13.5-35

13.5.2.2.6.5 **Heavy Load Handling Procedures**

Procedures to control handling of heavy loads are provided and meet the guidance of NUREG-0612, Section 5.1. These procedures include:

- Identification of required equipment
- Inspections and acceptance criteria required before movement of load
- The steps and proper sequence to be followed in handling the load
- Defining the safe load path
- Other special precautions

STD SUP 13.5-36

13.5.2.2.7 **Material Control Procedures**

The QAPD provides a description of procedural requirements for material control.

STD SUP 13.5-37

13.5.2.2.8 **Security Procedures**

A discussion of security procedures is provided in the Security Plan.

STD SUP 13.5-38

13.5.2.2.9 **Refueling and Outage Planning Procedures**

Procedures provide guidance for the development of refueling and outage plans, and as a minimum address the following elements:

- An outage philosophy which includes safety as a primary consideration in outage planning and implementation
- Separate organizations responsible for scheduling and overseeing the outage and provisions for an independent safety review team that would be assigned to perform final review and grant approval for outage activities
- Control procedures, which address both the initial outage plan and safety-significant changes to schedule
- Provisions that activities receive adequate resources

- Provisions that defense-in-depth during shutdown and margins are not reduced or provisions that an alternate or backup system must be available if a safety system or a defense-in-depth system is removed from service
- Provisions that personnel involved in outage activities are adequately trained including operator simulator training to the extent practicable, and training of other plant personnel, including temporary personnel, commensurate with the outage tasks they are to perform
- The guidance described in NUMARC 91-06, "Guidelines for Industry Actions to Assess Shutdown Management," to reduce the potential for loss of reactor coolant system boundary and inventory during shutdown conditions (Reference 13.5-203)

13.5.3 COL Information

13.5-1-A Administrative Procedures Development Plan

STD COL 13.5-1-A This COL item is addressed in Subsection 13.5.1.

13.5-2-A Plant Operating Procedures Development Plan

STD COL 13.5-2-A This COL item is addressed in Subsection 13.5.2.

13.5-3-A Emergency Procedures Development

STD COL 13.5-3-A This COL item is addressed in Subsection 13.5.2.

13.5-4-A Implementation of the Plant Procedures Plan

STD COL 13.5-4-A This COL item is addressed in Section 13.5 and Subsection 13.5.2.

13.5-5-A Procedures for Calibration, Inspection, and Testing

STD COL 13.5-5-A This COL item is addressed in Subsection 13.5.2.

13.5-6-H Procedures Included in Scope of Plan

STD COL 13.5-6-H This COL item is addressed in Subsection 13.5.2.

13.5.4 References

13.5-201 American National Standards Institute, Overhead and Gantry Cranes, ANSI B30.2- 2001.

13.5-202 American Society of Mechanical Engineers, Quality Assurance Requirements for Nuclear Facility Applications, NQA-1-1994.

13.5-203 Nuclear Utilities Management and Resources Council, Guidelines for Industry Actions to Assess Shutdown Management, NUMARC 91-06, December 1991.

13.5-204 General Electric Corporation, Licensing Topical Report ESBWR Human Factors Engineering Procedures Development Implementation Plan, NEDO-33274, Revision 2, March 2007.

Table 13.5-201 Pre-COL Phase Administrative Programs and Procedures

[STD SUP 13.5-39]

(This table is included for future designation as historical information.)

Design/Construction Quality Assurance Program
Reporting of Defects and Noncompliance,10 CFR 21 Program
Construction License Fitness for Duty Programs, 10 CFR 26
Design Reliability Assurance Program

Table 13.5-202 Nominal Procedure Development Schedule [STD COL 13.5-1-A]

This table is included for future designation as historical information.

Category A: Controls

Group	Procedure Type	Preparation Milestone
1	Procedures review and approval	6 months before first license class
2	Equipment control procedures	18 months before fuel load
3	Control of maintenance and modifications	18 months before fuel load
4	Fire Protection procedures	1. 6 months before fuel receipt for elements of the program supporting fuel onsite 2. 6 months before fuel load for elements supporting fuel load and plant operation
5	Crane operation procedures	6 months before fuel receipt
6	Temporary changes to procedures	6 months before first license class
7	Temporary procedures	6 months before first license class
8	Special orders of a transient or self-canceling character	6 months before first license class

Category B: Specific Procedures

Group	Procedure Type	Preparation Milestone
1	Standing orders to shift personnel including the authority and responsibility of the shift supervisor, licensed senior reactor operator in the control room, control room operator, and shift technical advisor	6 months before first license class
2	Assignment of shift personnel to duty stations and definition of “surveillance area”	6 months before first license class
3	Shift relief and turnover	6 months before fuel load
4	Fitness for duty	1. Construction FFD program: 6 months before on-site construction of safety- or security-related SSCs 2. Operational FFD program: 6 months before fuel load
5	Control room access	6 months before fuel load
6	Limitations on work hours	6 months before fuel load
7	Feedback of design, construction, and applicable important industry and operating experience	6 months before fuel load
8	Shift supervisor administrative duties	6 months before fuel load
9	Verification of correct performance of operating activities	6 months before first license class

13.6 Physical Security

This section of the referenced DCD is incorporated by reference with the following departures and/or supplements.

13.6.2 Security Program

Add the following paragraph at the end of this section:

STD SUP 13.6-1

The Physical Security Plan during construction, including control of access to the new plant construction site, is consistent with NEI 03-12, Appendix F (Reference 13.6-201), which is currently under NRC review. Table 13.4-201 provides milestones for security program implementation.

13.6.4 References

13.6-201 Nuclear Energy Institute, Security Measures During New Reactor Construction, NEI 03-12, Appendix F.

13.7 Fitness for Duty

STD SUP 13.7-1

The Fitness for Duty (FFD) Program is implemented and maintained in two phases: the construction phase program and the operating phase program. The construction phase program is consistent with NEI 06-06 (Reference 13.7-201), which is currently under NRC review. The construction phase program is implemented, as identified in Table 13.4-201, prior to on-site construction of safety- or security-related SSCs. The licensee commits to an operations phase program consistent with 10 CFR 26. The operations phase program is implemented prior to fuel receipt, as identified in Table 13.4-201.

13.7.1 References

13.7-201 Nuclear Energy Institute (NEI) “Fitness for Duty Program Guidance for New Nuclear Power Plant Construction Sites,” NEI 06-06.

Appendix 13AA Design and Construction Responsibilities

EF3 COL 13.1-1-A

13AA.1 Design and Construction Activities

Detroit Edison has substantial experience in the design, construction, and operation of nuclear power plants and substantial experience in

activities of similar scope and complexity. Detroit Edison was responsible for the design and construction activities associated with Fermi 2. Detroit Edison oversaw the activities of a number of engineering, design and construction companies, including General Electric Company, Sargent & Lundy, Stone & Webster, Parsons Company and Daniels Construction Company.

In addition, Detroit Edison has been responsible for the design, construction, and operation of several large fossil stations, activities of similar scope and complexity. With an 11,000 megawatt system capacity, the company has been associated with the construction and generation of power facilities such as coal, nuclear, natural gas and hydroelectric pumped storage. An example is the Belle River coal facility which generates in excess of 1000 MW.

Detroit Edison's management, engineering, and technical support organization for the construction and operation of Fermi 3 are described in Chapter 17 and Chapter 13, respectively. As described in Subsection 1.4.1, Detroit Edison has selected General Electric Hitachi (GEH) as its primary contractor for the design of Fermi 3. The primary contractors for site engineering, and construction of the nuclear and turbine islands have not yet been selected.

Other design and construction activities will be contracted to qualified suppliers of such services. Implementation or delegation of design and construction responsibilities is described in the sections below. Quality Assurance aspects are described in Chapter 17.

13AA.1.1 Principal Site-Related Engineering Work

The principal site engineering activities accomplished towards the construction and operation of the plant are:

Meteorology

Information concerning local (site) meteorological parameters is developed and applied by station and contract personnel to assess the impact of the station on local meteorological conditions. An onsite meteorological measurements program is employed by station personnel to produce data for the purpose of making atmospheric dispersion estimates for postulated accidental and expected routine airborne releases of effluents. A maintenance program is established for

surveillance, calibration, and repair of instruments. More information regarding the study and meteorological program is found in Section 2.3.

Geology

Information relating to site and regional geotechnical conditions is developed and evaluated by utility and contract personnel to determine if geologic conditions could present a challenge to safety of the plant. Items of interest include geologic structure, seismicity, geological history, and ground water conditions. The excavation for safety-related structures are geologically mapped and photographed by experienced geologists. Unforeseen geologic features that are encountered are evaluated. Section 2.5 provides details of these investigations.

Seismology

Information relating to seismological conditions is developed and evaluated by utility and contract personnel to determine if the site location and area surrounding the site is appropriate from a safety standpoint for the construction and operation of a nuclear power plant. Information regarding tectonics, seismicity, correlation of seismicity with tectonic structure, characterization of seismic sources, and ground motion are assessed to estimate the potential for strong earthquake ground motions or surface deformation at the site. Section 2.5 provides details of these investigations.

Hydrology

Information relating to hydrological conditions at the plant site and the surrounding area is developed and evaluated by utility and contract personnel. The study includes hydrologic characteristics of streams, lakes, shore regions, the regional and local groundwater environments, and existing or proposed water control structures that could influence flood control and plant safety. Section 2.4 includes more detailed information regarding this subject.

Demography

Information relating to local and surrounding area population distribution is developed and evaluated by utility and contract personnel. The data is used to determine if requirements are met for establishment of exclusion area, low population zone, and population center distance. Section 2.1

includes more detailed information regarding population around the plant site.

Environmental Effects

Monitoring programs are developed to enable the collection of data necessary to determine possible impact on the environment due to construction, startup, and operational activities and to establish a baseline from which to evaluate future environmental monitoring. This program is described in the separately submitted Environmental Report.

13AA.1.2 Design of Plant and Ancillary Systems

Design and construction of systems outside the power block such as circulating water, service water, switchyard, and secondary fire protection systems are performed by Detroit Edison or qualified contractors, as assigned.

13AA.1.3 Review and Approval of Plant Design Features

Design engineering review and approval is performed in accordance with Chapter 17. The reactor vendor is responsible for design control of the power block. Design work is performed in accordance with the design and construction QA manual including the reviews necessary to verify the adequacy of the design. Verification is performed by competent individuals or groups other than those who performed the original design. Design issues arising during construction are addressed and implemented with notification and communication of changes to the manager in charge of engineering for review. As systems are tested and approved for turnover and operation, control of design is turned over to plant staff. The manager in charge of engineering, along with functional managers and staff, assumes responsibility for review and approval of modifications, additions, or deletions in plant design features, as well as control of design documentation, in accordance with the Operational QA Program. Design control becomes the responsibility of the manager in charge of engineering prior to loading fuel. During construction, startup, and operation, changes to human-system interfaces of control room design are approved using a Human Factors Engineering evaluation addressed within DCD Chapter 18. See Figure 13.1-201, Construction Organization and the QAPD (incorporated into Section 17.5) for reporting relationships.

13AA.1.4 Environmental Effects

Impact to the surrounding environment from construction and operating activities is fully addressed in the separately submitted Environmental Report.

13AA.1.5 Security Provisions

The Physical Security Plan is designed with provisions that meet the applicable NRC regulations. See Section 13.6 and the Security Plan, which was submitted under separate transmittal.

13AA.1.6 Development of Safety Analysis Reports

Information regarding the development of the FSAR is found in Chapter 1.

13AA.1.7 Review and Approval of Material and Component Specifications

Safety-related material and component specifications of SSCs designed by the reactor vendor are reviewed and approved in accordance with the reactor vendor quality assurance program and Section 17.1. Review and approval of items not designed by the reactor vendor are controlled for review and approval by Section 17.5 and the QAPD.

13AA.1.8 Procurement of Materials and Equipment

Procurement of materials during construction phase is the responsibility of the reactor vendor and constructor. The process is controlled by the construction QA programs of these organizations. Oversight of the inspection and receipt of materials process is the responsibility of the EPC executive.

13AA.1.9 Management and Review of Construction Activities

Management and responsibility for construction activities is assigned to the EPC executive. The EPC executive is accountable to the senior VP, major enterprise projects. See Figure 13.1-201, Construction Organization.

Monitoring and review of construction activities by utility personnel is a continuous process at the plant site. Contractor performance is monitored to provide objective data to utility management in order to identify problems early and develop solutions. Monitoring of construction activities verifies that the contractors are in compliance with contractual obligations for quality, schedule, and cost. To maintain independence

from the construction organization, the oversight organization has functional access to the Senior VP, Major Enterprise Projects.

Monitoring and review of construction activities is divided functionally across the various disciplines of the utility construction staff, i.e. electrical, mechanical, instrument and control, etc., and tracked by schedule based on system and major plant components/areas.

After each system is turned over to plant staff the construction organization relinquishes responsibility for that system. At that time the construction organization will be responsible for completion of construction activities as directed by plant staff and available to provide support for start-up testing as necessary.

13AA.2 Preoperational Activities

This section describes the activities required to transition the unit from the construction phase to the operational phase. These activities include turnover of systems from construction, preoperational testing, schedule management, test procedure development, fuel load, integrated startup testing, and turnover of systems to plant staff.

13AA.2.1 Development of Human Factors Engineering Design Objectives and Design Phase Review of Proposed Control Room Layouts

HFE design objectives are initially developed by the reactor vendor in accordance with DCD Chapter 18. As a collaborative team, personnel from the reactor vendor design staff and personnel, including licensed operators, engineers, and instrumentation and control technicians from owner and other organizations in the nuclear industry, assess the design of the control room and man-machine interfaces to attain safe and efficient operation of the plant. See DCD Section 18.2 for additional details of HFE program management.

Modifications to the certified design of the control room or man-machine interface described in the DCD are reviewed per engineering procedures, as required by DCD Section 18.2, to evaluate the impact to plant safety. The manager in charge of engineering is responsible for the HFE design process and for the design commitment to HFE during construction and throughout the life of the plant. The HFE program is established in accordance with the description and commitments in DCD Chapter 18.

13AA.2.2 Preoperational and Startup Testing

Functional managers reporting to the plant manager are assigned responsibility for organizing and developing the preoperational testing and startup testing organizations. These organizations prepare procedures and schedules and conduct preoperational and startup testing. The preoperational and startup testing organizations are staffed by testing engineers, procedure writers, and planner/schedulers. The qualification requirements of testing engineers in the preoperational and startup testing organizations meet those established in ANSI/ANS-3.1 (Reference 13.1-201).

Test engineers are responsible for integrated testing of systems to prove functionality of system design requirements. They provide guidance and supervision to procedure writers and communicate closely with operations personnel and other supporting staff to facilitate safe and efficient performance of preoperational and startup tests. The scope of testing to be accomplished is presented in Chapter 14. As systems are turned over from the constructor they are tested by component then by integrated system preoperational test. Sufficient numbers of personnel are assigned to perform preoperational and startup testing to facilitate safe and efficient implementation of the testing program. Plant-specific training provides instruction on the administrative controls of the test program. The startup test program provides data and experience useful during the operational phase.

During the preoperational and startup testing phases, the constructor and reactor vendor staff support, as necessary, the testing performed by the nuclear plant preoperational and startup testing staffs. The functional managers in charge of preoperational and startup testing are assisted by other station organizations including operations, plant maintenance, and engineering. These assisting organizations provide support in developing test procedures, conducting the test program, and in reviewing test results.

Procedures are written to describe organizational responsibilities and interfaces between staff, constructor, and reactor vendor, and to establish direction in writing, reviewing, and performing tests. The construction organization, depicted in Figure 13.1-201, includes the preoperational and startup testing functional groups.

13AA.2.3 Development and Implementation of Staff Recruiting and Training Programs

Staffing plans are developed with input from the reactor vendor for safe operation of the plant as determined by HFE. See DCD Section 18.6. These plans are developed under the direction and guidance of the site executive, the executive in charge of engineering, and the executive in charge of support. **[START COM 13AA-001]** Staffing plans will be completed and manager level positions filled prior to start of preoperational testing. Personnel selected to be licensed reactor operators and senior reactor operators along with other staff necessary to support the safe operation of the plant are hired with sufficient time available to complete appropriate training programs and become qualified and licensed (if required) prior to fuel being loaded in the reactor vessel. See Figure 13.1-202 for hiring and training requirements for operator and technical staff relative to fuel load. **[END COM 13AA-001]**

Because of the dynamic nature of the staffing plans and changes that occur over time, it is expected that specific numbers of personnel on site will change. Table 13.1-201 includes the initial estimated number of staff for selected positions that will be filled at the time of initial fuel load. Recruiting of personnel to fill positions is the shared responsibility of the manager in charge of human resources and the various heads of departments. The training program is described in Section 13.2.

Appendix 13BB Training Program

STD SUP 13.2-1
STD COL 13.2-1-A
STD COL 13.2-2-A

NEI 06-13-A (Reference 13BB-201), Technical Report on a Template for an Industry Training Program Description, is incorporated by reference with the following supplements:

Add the following information to NEI 06-13, as numbered:

STD SUP 13.2-2

1.1.3 Licensed Operator Training Program Prior to Commercial Operation

STD COL 13.2-1-A

Prior to initial commercial operation, licensed operator training is conducted early in the construction phase to support preoperational testing and cold and hot functional activities. Licensed operator training conducted prior to commercial operation is referred to as “cold” licensed operator training. Cold licensed operator training is conducted as described in Subsection 1.1.1.

Cold licensing of operators at a new plant provides the method for operations personnel to acquire the knowledge and experience required for licensed operator duties during the unique conditions of new plant construction.

Prior to commercial operation, plant experience requirements specified in RG 1.8 (Revision 3) and ANSI/ANS 3.1-1993 can not be met. Therefore, during cold license operator training, the Regulatory Position C.1.b of RG 1.8 (Revision 2) applies: cold license operator candidates will meet the training elements defined in ANSI/ANS 3.1 but are exempt from the experience requirements defined in ANSI/ANS 3.1. Alternate methods of gaining plant experience, in addition to those referenced in RG 1.8 and associated ANS/ANSI standards, are described in Subsection 1.1.3.2.

Approximately 18 months prior to expected fuel load, the NRC examination is administered for cold licensed operator candidates and includes a written examination, simulator examination, and in-plant job performance measures (JPMs). Sufficient operator licenses are obtained to support operational shifts prior to first fuel load.

The cold licensed operator training process terminates when the last licensed operator training class initiated during the plant construction/ preoperational test phases has taken a scheduled NRC license examination or the plant becomes operational, whichever is later.

1.1.3.1 Licensed Operator Continuing Training Prior to Commercial Operation

The SAT process is utilized to determine continuing training needs for cold licensed operator candidates following completion of the initial phases of their training. Structured continuing training is provided to maintain the license candidates' knowledge and ability and includes topics related to plant modifications, construction, functional testing, and OE related to construction activities.

An accredited licensed operator requalification training program is implemented within 90 days following the issuance of the first NRC operator licenses. This facilitates maintaining the licensed operators' knowledge and ability and meets the milestone guidance related to the Reactor Operator Requalification Training Program provided in RG 1.206.

1.1.3.2 Licensed Operator Experience Requirements Prior to Commercial Operation

Each cold licensed operator candidate's operational experience is assessed prior to selection for a licensed training program; however, experience requirements are not required to be fully met prior to enrolling in an operator training program. In addition, total experience requirements and one year on-site experience requirements not fully met at the time of the licensed operator application submittal shall be met prior to issuing the individual's NRC operator license. Following satisfactory completion of an NRC license examination, the licensee notifies the NRC when the candidate's experience requirements are met.

Experience is gained anytime prior to fuel load by participating in construction and testing activities. Operational experience on a one-for-one basis is achieved during the construction and testing phases while performing one or more of the following tasks:

- Plant operating procedure development and verification
- Human engineering and task analysis verification
- Preoperational testing of plant systems
- Participating in the cold and hot functional testing program
- Acting as an operations classroom, simulator, or on-the-job training (OJT) instructor

The above practical work assignments provide experience and fulfills the one year on-site experience requirement cited in RG 1.8 and the three month on-shift requirement cited in ANSI/ANS 3.1. On-site experience is also gained on a one-for-one basis at a nuclear reactor site of similar design (e.g., PWR or BWR).

An RO candidate who completes a site-specific non-licensed operator training program for critical non-licensed operator tasks and completes a site familiarization course designed on a systematic evaluation of site design features and operator site familiarization needs satisfies the one year on-site experience and six months as a non-licensed operator at the facility for which the license is sought requirements cited in RG 1.8.

A non-degreed SRO candidate who completes a combined RO and SRO course and completes a site familiarization course designed on a systematic evaluation of site design features and operator site

familiarization needs satisfies the one year experience requirement as a licensed RO cited in RG 1.8.

For a degreed SRO, performing construction and testing activities described above on a one-for-one basis satisfies the six month on-site experience requirement as a staff engineer cited in RG 1.8.

An SRO candidate (degreed or non-degreed) who completes a plant referenced simulator course or an observation course at an operating reactor of similar design meets the special experience requirements related to at power and startup operations described in ANSI/ANS 3.1. These courses are based on a systematic analysis of the supervisory skill, knowledge, and ability required of a SRO. A systematic process to identify the objectives associated with experience gained at an operating facility coupled with high fidelity simulation provides assurance that the requisite knowledge, skill, and ability level has been achieved.

1.1.3.3 On-the-Job Training Prior to Commercial Operation

Until equipment installation is sufficiently complete, viable alternatives for performance of in-plant JPMs are identified including, but not limited to, discussion, mock-ups, virtual presentations and part task simulation. Time spent in OJT training is counted as on-site and total nuclear power plant experience.

Until the plant becomes operational, viable alternatives for the main control room OJT (three months on-shift as an extra person) are identified including, but not limited to, preoperational testing activities, simulator time focused on crew operations, or dedicated observation time in the main control room of an operating nuclear power plant.

1.1.3.4 Plant-Referenced Simulation Facilities Prior to Commercial Operation

The initial phase of licensed operator simulator training is performed with a simulation facility modeled in accordance with the guidance of RG 1.149 and its associated ANSI/ANS standards as described below. The simulation facility is a high fidelity/quality training device and is maintained in accordance with the criteria of ANSI/ANS 3.5 1998, Appendix D.

Simulation models are updated as information concerning plant design and performance is obtained. These updates ensure the simulator is current with plant design and can be used as a reliable training tool.

The following provides a generic simulator training sequence indicating the use of part task/limited scope simulator and plant referenced simulator for licensed operator training. The actual sequence may vary depending on plant construction scheduling.

- **[START COM 13BB-001]** Phase 1 (approximately 40 months prior to fuel load) - The part task/limited scope simulator is used to provide licensed operator training based on standardized design simulator modeling and operating procedures. **[END COM 13BB-001]**
- **[START COM 13BB-002]** Phase 2 (approximately 24 months prior to fuel load) – An ANSI/ANS 3.5 1998 plant referenced simulator is used in final phase of licensed operator initial training to perform reactivity manipulations and complete required NRC license candidate training. **[END COM 13BB-002]**
- **[START COM 13BB-003]** Phase 3 (approximately 18 months prior to fuel load) – An ANSI/ANS 3.5 1998 plant referenced simulator is used for performance of NRC operator initial license examinations. **[END COM 13BB-003]**

Prior to conducting the simulator portion of licensed operator examination, the plant-referenced simulator response is tested and validated against plant design data to ensure the simulator meets the operational and testing criteria of 10 CFR 55.46, paragraph (c).

13.BB **References**

13BB-201 Nuclear Energy Institute (NEI), “Technical Report on a Template for an Industry Training Program Description,” NEI 06-13-A.