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

VCS COL 13.1-1-A

13.1 Organizational Structure of Applicant

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

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

Replace the first paragraph with the following.

This section describes the organization of VCS Units 1 and 2. It describes organizational positions of the nuclear power station and Owner/Applicant Corporation and associated functions and responsibilities. The position titles used in the text are generic and describe the function of the position. Table 13.1-201, Generic Position/Site Specific Position Cross Reference, provides a cross-reference to identify the corresponding site-specific position titles. The organizational structure as described in this section 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

Exelon Corporation has over 48 years of experience in the design, construction, and operation of nuclear generating stations. Exelon currently operates seventeen nuclear units at ten sites in Illinois, Pennsylvania, and New Jersey.

Corporate offices provide support for the nuclear stations. This support includes executive level management to provide strategic and financial support for plant initiatives, coordination of functional efforts division-wide, and functional level management in areas such as training, security, emergency planning, and engineering analysis.

13.1.1.1 Design, Construction, and Operating Responsibilities

The chief executive officer has overall responsibility for functions involving design, construction, and operation. Line responsibilities for those functions are assigned to the executive (vice president) in charge of the design and construction of new nuclear plants and to the chief nuclear officer (CNO) for operation. At the appropriate time after construction, the CNO accepts responsibility for the site from the new plant executive and then maintains direct control of nuclear plant operation through the chief operating officer, regional senior vice president operations and site executive in charge of plant management (site vice president — VCS), plant manager and the operations, engineering, maintenance and work management directors and their direct reports. 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, decision-making, and communication are clearly and unambiguously established to enable the understanding of the various project members, including contractors, that utility management is in charge and directs the project. Key executive and corporate management positions, functions, and responsibilities are discussed herein. The corporate organization is shown in Figure 13.1-203. The management and technical support organization for design, construction, and preoperational activities is addressed in Appendix 13AA and is incorporated here.

Provisions for Technical Support Functions

Before beginning preoperational testing, the site executive in charge of plant management (Sr. VP operations), the executive in charge of operations support (Sr. VP operations support), and the executive in charge of engineering and technical services (Sr. VP engineering and technical services) will establish the site organization of managers, functional managers, supervisors, and staff sufficient to perform required

functions for support of safe plant operation. These functions include the following:

RG 1.206 Technical Support for Operations	Exelon Departmental Functions
(a) Engineering	Engineering-Nuclear, mechanical, structural, electrical, thermal-hydraulic, metallurgical and material, and instrumentation and controls
(b) Plant chemistry	Chemistry
(c) Health Physics	Radiation protection and environmental support
(d) Fueling and refueling operations support	Fueling and refueling operations support
(e) Maintenance support	Maintenance
(f) Operations support	Operations
(g) QA	Nuclear Oversight-Quality Assurance, audit and assessments
(h) Training	Training
(i) Safety review	Nuclear Safety Review
(j) Fire protection	Fire Protection
(k) Emergency coordination	Emergency Planning
(l) Outside contractual assistance	Work Management-Supply

In the event that station personnel are not qualified to deal with a specific issue, the services of qualified individuals from other functional areas within the company or outside consultants are engaged. For example, major contractors, such as the reactor technology vendor or turbine generator manufacturer, provide technical support when equipment modifications or special maintenance problems are considered. Special studies, such as environmental monitoring, may be contracted to qualified consultants. Figure 13.1-201 illustrates the management and technical support organizations supporting operation of the plant. See Subsection 13.1.1.2 for the description of responsibilities and authorities of management positions for organizations providing technical support. Table 13.1-201 shows the estimated number of positions required for each function. Multiple layers of protection are provided to preserve unit integrity including organization. Organizationally, operators and other shift members are assigned to a specific unit. Physical separation of units helps to minimize wrong-unit activities. Station procedures and programs also provide operating staff with methods to minimize human error

including tagging programs, procedure adherence requirements, and training.

Engineering

The engineering department is responsible for the support of plant operations through the utilization of various engineering programs. It supports procurement, chemical and environmental analysis and maintenance activities in the plant as requested by the plant manager. Additional responsibilities include the performance of design engineering of plant modifications, maintaining the design basis, updating documents as necessary to reflect the actual as-built configuration of the plant, performing accident and transient analyses, and the human factors engineering design process.

Plant engineering is governed by a central corporate engineering organization under the VP of engineering and technical services with regional support personnel in both the East and Midwest offices. Oversight of the processes and programs is the responsibility of the VP of engineering and accomplished through the director and managers in the various disciplines.

Corporate engineering provides support for engineering projects, safety and engineering analysis, and nuclear fuels engineering. They are responsible for probabilistic safety assessment and other nuclear safety issues, plant system reliability analysis, performance and technical support.

The site engineering department consists of a director, two senior managers (senior manager plant engineering and senior manager design engineering), and various supporting managers and supervisors. Functional groups consist of plant engineering, design engineering, and engineering programs. These groups are responsible for performing the plant system support and design activities. They also provide engineering expertise for programs such as inservice inspection (ISI), inservice testing (IST), snubbers, and maintenance rule.

Each of the site engineering groups has a functional manager who reports through the senior managers of design or plant systems to the engineering director who is in charge of engineering. The engineering programs manager is a direct report to the engineering director. The engineering director reports to the site vice president.

Engineering services may be contracted to and performed by outside companies in accordance with the quality assurance (QA) program. Engineering resources are shared between units. A single management organization oversees the engineering work associated with the station units.

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 byproducts is kept to levels that allow operations and maintenance with radiation doses as low as reasonably achievable.

Overall responsibility for fleet chemistry is the responsibility of the VP of operations support. Governance, support, and oversight of the operations area is provided by the corporate director for chemistry.

The site functional manager in charge of chemistry is responsible to the plant manager for maintaining chemistry programs and 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.

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

Radiation Protection

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

Overall responsibility for fleet radiation protection is the responsibility of the VP of operations support. Governance, support, and oversight of the operations area is provided by the corporate RP director.

The site RP department is staffed by radiation protection technicians, support personnel, and supervisors who report to the functional manager in charge of radiation protection. The manager in charge of the RP program is the radiation protection manager (RPM) who reports directly to the plant manager.

A single management organization oversees the RP group for both units and personnel resources of the RP organization are shared between units.

Fueling and Refueling Operations Support

The function of fueling and refueling is the responsibility of the corporate outage director who is supported by the corporate manager of reactor services. A senior project manager is located on site to coordinate the reactor services functions which includes but is not limited to refueling operations. The refueling function is supported by a combination of personnel from various departments including operations, maintenance, radiation protection, engineering, and the reactor technology vendor or other contractor staff.

Initial fueling and all subsequent refueling operations are the responsibility of the corporate outage support organization.

The site outage manager who is in charge of outages is also responsible for the planning and scheduling of outages and for arranging the necessary refueling support. This position reports to the director of work management.

Personnel resources of the outage support organization are shared between both units and throughout the Exelon fleet. A single management organization oversees outage support work associated with the station units.

Maintenance

The maintenance department is responsible for performing the required preventative and corrective maintenance of the plant and its support systems to ensure it operates safely and reliably.

Overall responsibility for fleet maintenance is the responsibility of the VP of operations support. Governance, support, and oversight of the maintenance area is provided by the corporate maintenance director.

The site maintenance department includes the three disciplines; mechanical maintenance, electrical maintenance, and instrumentation and control (I&C) groups as well as planning, support, and component optimization personnel. Each group includes a manager, supervisors, 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 and schedulers 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. The manager in charge of maintenance (maintenance director) reports to the plant manager.

A single management organization oversees the function of maintenance support for the station units and the personnel of the maintenance support organization are shared between units.

Operations

The operations department is responsible for and in charge of operating the plant.

Overall responsibility for fleet operations is the responsibility of the VP of operations support. Governance, support, and oversight of the operations area are provided by the corporate director of operations.

The site functional manager is the operations director. Supporting the director is the shift operations superintendent (SOS), the operations services manager, the operations support manager, and the reactor engineering manager.

The operations director reports to the plant manager and is supported by a corporate functional area manager for operations (corporate operations director).

The SOS is responsible for the day-to-day shift operations. The on-shift personnel report to this position. A shift manager, who reports to the SOS, supervises each operations shift. Each shift contains sufficient personnel with RO or SRO licensed personnel as required by the technical specifications.

The operations support function is provided by the managers of support and services. These support functions include the following programs:

- Operations procedures
- Operations surveillances
- Equipment tagging

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. Responsibilities include core management and periodic reactor testing.

Nuclear Oversight-Quality Assurance, Audit and Assessments

Safety related activities associated with the operation of the plant are overseen in accordance with the Quality Assurance Program Description (QAPD) as described in Chapter 17. The requirements and commitments contained in the QAPD apply to activities associated with structures, systems, and components which are safety related and mandatory and must be implemented, enforced, and adhered to by individuals and organizations. QA requirements are implemented through the use of approved procedures, policies, directives, instructions, or other documents, which provide written guidance for the control of quality related activities and provide for the development of documentation to provide objective evidence of compliance. The QA functions include:

- Maintenance of the QAPD
- Coordinating the development of audit schedules
- Audit, surveillance, and evaluation of nuclear division suppliers
- Routine assessment of plant performance

The QA organization referred to as Nuclear Oversight (NOS) is independent of the station management line organization. Quality control (QC) inspection/testing activities support plant operation, maintenance, and outages and are also independent of the station management line organization and reports to the site nuclear oversight manager. The site NOS manager reports to the corporate nuclear oversight director who reports to the corporate VP of nuclear oversight.

A single management organization oversees the NOS group for the station and personnel resources (auditors) of the QA organization are shared between units.

Training

The objective of training programs is to provide qualified personnel how to operate and maintain the plant in a safe and efficient manner and to provide compliance with the license, technical specifications, and applicable regulations.

The corporate vice president of training and the associated corporate training directors and managers for the various programs provide overall governance, support, and oversight of the training processes.

The site 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, and emergency response.

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, maintenance and technical training, and radworker training.

The functional manager of training is the training director and reports to the site vice president. The training director is responsible for identifying the programmatic training needs of stations personnel, ensuring the effectiveness of training programs, incorporating operating experience into training, and monitoring participation. In addition, the training director is accountable for developing and implementing the various training programs, ensuring the applicable ones are and remain accredited by INPO. Nuclear plant training programs are described in Subsection 13.2 of the FSAR.

A single management organization provides oversight of station training activities, and personnel resources of the training department are shared between units.

The site training director is supported by the corporate vice president of training and associated corporate training directors for the various programs.

Nuclear Safety Review

Quality Assurance review and audit activities are addressed in Chapter 17.

The Nuclear Safety Review Board (NSRB) is a corporate safety review committee, consisting of both external members (industry experts) and Exelon nuclear management personnel from other Exelon stations. It acts as a collegial body that conducts independent reviews of Exelon’s nuclear stations performance and operations.

The NSRB provides an integral part of the Exelon nuclear oversight process by independently and directly assessing the performance of the stations and advising the chief nuclear officer (CNO) with respect to

nuclear safety performance. The scope includes facility operations and the adequacy and implementation of all Exelon nuclear safety policies and programs. Based on periodic assessments, the NSRB will provide comments and/or recommendations to improve nuclear safety and plant reliability. The NSRB chairman reports directly to the CNO.

Fire Protection

The station maintains a fire protection program as described in Subsection 9.5.1.15. The engineering director is responsible for the fire protection program. Assigning the responsibilities at that level provides the authority to obtain the resources and assistance necessary to meet fire protection program objectives, resolve conflicts, and delegate appropriate responsibility to fire protection staff.

Fire protection for the facility is organized and administered by the engineer in charge of fire protection. The engineering director, through the engineer 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. The engineer in charge of fire protection coordinates operations-related fire protection program activities with the manager in charge of operations support. Functional descriptions of position responsibilities are included in appropriate procedures. Station personnel are responsible for adhering to the fire protection/prevention requirements detailed in Subsection 9.5.1.

The fire brigade is described in Section 13.1.2.2.

The site construction executive has the lead responsibility for overall site fire protection during construction of the new units.

A single management organization oversees the fire protection function for both units and personnel resources of the fire protection organization are shared between units.

Emergency Planning

The emergency response 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 positions in the emergency response 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 coordinate drills and training to maintain qualified 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 regulatory assurance manager, who reports to the site vice president.

The site emergency plan organization is described in the Emergency Plan.

A single management organization oversees the emergency planning function for the station units.

Work Management-Supply

The materials, purchasing, and contracts organization provide contract assistance with vendors and suppliers of services not available from organizations established as part of utility staff. Personnel in the materials, purchasing, and contracts organization perform the necessary functions to contract vendors of special services to perform tasks for which utility staff does not have the experience or equipment required. The functional manager in charge of materials, purchasing, and contracts reports to the corporate nuclear supply manager, as well as the manager in charge of engineering and site support. Resources of the materials, purchasing, and contracts organization are shared between units. A single management organization oversees the materials, purchasing, and contracts group for the station units.

Work Management

The work management department is responsible for the development and implementation of the maintenance work schedule and the development and execution of all outages, including forced outages and refueling outages. It is responsible for assuring that the "on-line" activities and the outages are effectively planned and properly managed including planning, scheduling, and reporting site work activities. Reporting to the director of work management are the outage manager, the "on-line" manager, and indirectly the supply manager.

Project Management

The project management group is responsible for implementing plant modifications and for managing and coordinating large engineering and design projects. The group is lead by the site project manager who reports to the site vice president.

13.1.1.2 Organizational Arrangement

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

Site Support Organization

13.1.1.2.1 Management Position Responsible for Engineering

The management position responsible for engineering is the onsite lead position for engineering and reports to the management position responsible for the nuclear site and functionally to the management position responsible for engineering and technical services. The management position responsible for engineering is responsible for engineering activities related to the operation or maintenance of the plant and design change implementation support activities and other functions described below.

The management position responsible for engineering directs functional managers responsible for plant engineering, design engineering, and engineering programs.

Functional Manager In Charge of Plant Engineering

The functional manager in charge of plant engineering reports to the management position responsible for engineering, supervises a technical staff of engineers and other engineering specialists, and coordinates their work with that of other groups.

The functional manager in charge of plant engineering is responsible for providing direction and guidance to system engineers as follows:

- Monitoring the efficiency and proper operation of balance of plant and reactor systems.
- Planning programs for improving equipment performance, reliability, or work practices.
- Conduct of operational tests and analyzing the results.
- Identification of plant spare parts for systems and components.

Functional Manager In Charge of Design Engineering

The functional manager in charge of design engineering reports to the management position responsible for engineering and is responsible for:

- Resolution of design issues.
- On-site development of design related change packages and plant modifications.
- Implementation of effective project management methods and procedures, including cost controls, for implementation of modifications.
- Management of contractors who may perform modification or construction activities.
- Maintaining configuration control program.

Functional Manager In Charge of Engineering Programs

The functional manager in charge of engineering programs reports to the manager in charge of engineering and is responsible for programs such as:

- Materials engineering
- Performance/ISI engineering
- Valve engineering
- Maintenance rule tracking and trending
- Piping erosion/corrosion
- In-service testing
- Equipment reliability engineering

Engineer in Charge of Fire Protection

The engineer in charge of fire protection and the fire protection program staff 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.
- Pre-fire planning including review and updating of pre-fire plans at least every two years.

The engineer in charge of fire protection reports to the site executive through the director in charge of engineering who has overall responsibility for fire protection of the plant. Additionally, the engineer in charge of fire protection is responsible for, and coordinates through, the operations support manager those activities assigned to the site fire marshal. The engineer in charge is responsible for all fire protection program requirements. In accordance with Regulatory Guide 1.189, the engineer in charge of fire protection is a graduate of an engineering curriculum of accepted standing and has completed not less than six years of engineering experience, three of which were in a responsible position in charge of fire protection engineering work.

Engineer in Charge of Safety and Engineering Analysis

The engineer in charge of safety and engineering analysis reports to the manager in charge of engineering programs and is responsible for:

- Development and maintenance of accident analysis activities and programs.
- Probabilistic risk assessment (PRA) studies for maintenance activities and outage management planning.

Functional Manager In Charge of Quality Assurance

The functional manager in charge of Quality Assurance (nuclear oversight manager) is responsible for those functions described previously in Subsection 13.1.1.1 and reports to the corporate director of nuclear oversight and indirectly to the site executive in charge of plant management. Responsibilities of the functional manager in charge of QA are generally performed by the supervisors and staff of the QA organization.

Functional Manager In Charge of Plant Licensing

The functional manager in charge of plant licensing (regulatory assurance manager) is responsible for providing a coordinated focus for interface with the NRC, and for technical direction and administrative

guidance to the licensing staff for licensing activities including the following:

- Developing licensee event reports (LERs) and responding to notices of violations.
- Coordinating review and concurrence of operating license and technical specification amendments, FSAR update submittals, generic letter responses; and tracking commitments
- Analyzing operating experience data and monitoring industry issues.
- Preparing the station for special NRC inspections, interfacing with NRC inspectors, and interpreting NRC regulations.
- Maintaining the licensing basis

The functional manager in charge of plant licensing reports to the corporate manager in charge of licensing and indirectly to the executive in charge of plant management.

Functional Manager In Charge of Training and Development

The functional manager in charge of training and development (training director) is responsible for training programs at the site required for the safe and proper operation and maintenance of the plant including:

- Operations training programs
- Maintenance and technical training programs
- Plant staff training programs
- Plant access training
- Radiation worker training

The functional manager in charge of training may seek assistance from other departments within the company or outside specialists such as educators and manufacturers. The functional manager in charge of training supervises a staff of training managers and supervisors who coordinate the development, preparation, and presentation of training programs for nuclear plant personnel and reports directly to the site executive in charge of plant management and secondarily to the corporate executive in charge of nuclear training.

Functional Manager In Charge of Materials, Purchasing, and Contracts

The functional manager in charge of materials, purchasing, and contracts is responsible for site purchasing. This position reports to the corporate nuclear supply director in charge of materials, purchasing, and contracts and is responsible for providing sufficient and proper materials to support the material needs of the plant and performing related activities including:

- Procedure development
- Materials storage
- Supply system database maintenance
- Meeting quality assurance and internal audit requirements

Functional Manager In Charge of Security

The functional manager in charge of security (site security manager) is responsible for:

- Implementation and enforcement of security directives, procedures, and instructions received from appropriate authorities.
- Day-to-day supervision of the security guard force.
- Administration of the security program.

The functional manager in charge of security reports directly to the site executive plant management and indirectly to the corporate security director.

Functional Manager In Charge of Corrective Actions and Performance Improvement

The responsibilities of the functional manager in charge of corrective actions and performance improvement include establishing processes and procedures to facilitate identification and correction of conditions adverse to quality and implementing corrective actions. The functional manager in charge of corrective actions and performance improvement reports to the regulatory assurance manager.

Functional Manager In Charge of Emergency Preparedness

The functional manager in charge of emergency preparedness is responsible for:

- Coordinating and implementing the plant emergency response plan with state and local emergency plans.

- Developing, planning, and executing emergency drills and exercises
- Emergency action level development
- NRC reporting associated with 10CFR50.54(q).

The functional manager in charge of emergency preparedness reports to the regulatory assurance manager.

Manager In Charge of Site Business

The manager in charge of site business (business manager) is responsible for conduct of business operations of the site. This includes business planning, financial planning, forecasting, controller, financial systems, business performance reporting, and project authorizations.

The manager in charge of business operations reports to the site executive in charge of plant management.

13.1.1.3 Qualifications of Technical Support Personnel

The qualifications of managers and supervisors of the technical support organization meet the qualification requirements in education and experience for those described in ANSI/ANS-3.1-1993 (Reference 13.1.5-201) as endorsed and amended by Regulatory Guide 1.8. The qualification and experience requirements of headquarters staff are established in corporate policy and procedure manuals. For details of personnel qualification requirements refer to Appendix 17BB, Section 2.6.

13.1.2 Operating Organization

13.1.2.1 Plant Organization

The plant management, technical support, and plant operating organizational alignment are shown in Figure 13.1-201. The on-shift operating organization is presented in Figure 13.1-202, which shows those positions requiring NRC licenses. 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 Chapter 17. Administrative procedures include:

- Establishment of a quality assurance program for the operational phase.

- Preparation of procedures necessary to carry out an effective quality assurance program. See Subsection 13.5 for description of the station procedure program.
- A program for review and audit of activities affecting plant safety. See Section 17.5 for description of station review and audit programs.
- Programs and procedures for rules of practice as described in Section 5.2 of N18.7-1976/ANS-3.2 (Reference 13.1.5-203).

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:

- Interface directly with radiation protection staff to integrate radiation protection measures into plant procedures and design documents and into the planning, scheduling, conduct, and assessment of operations and work.
- Notify radiation protection personnel promptly when radiation protection problems occur or are identified, take corrective actions, and resolve deficiencies associated with operations, procedures, systems, equipment, and work practices.
- Ensure department personnel receive training on radiation protection and periodic retraining, in accordance with 10 CFR Part 19, so that they are properly instructed and briefed for entry into restricted areas.
- Periodically observe and correct, as necessary, radiation worker practices.
- Support radiation protection management in implementing the radiation protection program.
- Maintain exposures to site personnel ALARA.

13.1.2.2 Plant Personnel Responsibilities and Authorities

Plant Manager

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

- Operations

- Maintenance
- Chemistry and radiochemistry
- Work management
- Radiation Protection

Additionally, the plant manager has overall responsibility for occupational and public radiation safety. In the absence of the executive of plant management, the plant manager will act in that capacity. Radiation protection responsibilities of the plant manager are consistent with the guidance in Regulatory Guide 8.8 and Regulatory Guide 8.10.

The line of succession of authority and responsibility for overall operations in the event of unexpected events (absence of the plant manager) of a temporary nature is as follows: (One of the following will be designated as responsible for station activities.)

a. Operations Director

b. Plant Maintenance Director

c. Engineering Director

As described in Section 13.1.1.1, the manager in charge on-shift (Shift Manager) is the plant manager's direct representative for the conduct of operations. The succession of authority includes the authority to issue standing or special orders as required.

Plant Maintenance Director

Maintenance of the plant is performed by the various maintenance department disciplines; mechanical, electrical, and instrumentation and control. Planning, scheduling, and work package preparations are performed by maintenance support. The functions of this department are to perform preventive and corrective maintenance, equipment testing, and implement modifications as necessary. The functional manager in charge of plant maintenance (plant maintenance director) 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 manager in charge of plant maintenance reports to the plant manager and provides direction and guidance to the maintenance discipline functional managers and maintenance support staff.

Maintenance Discipline Functional Managers

The functional managers of each maintenance discipline (mechanical, electrical, instrumentation and control, planning, component optimization, 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 director in charge of plant maintenance.

Maintenance Discipline Supervisors

The maintenance discipline 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.

Director of Work Management

The director of work management is responsible for the development and execution of the maintenance work schedule and for performing on-line and outage related maintenance of structures/systems/components (SSC) in order to enhance overall plant safety and reliability.

The schedule is developed to perform corrective, preventive, and predictive maintenance activities on SSCs important to safety and reliability at power to ensure that an SSCs overall reliability will be maintained or improved. The benefits of well managed maintenance conducted during power operations include increased system and unit reliability, reduction of SSC deficiencies that could impact operations, more focused attention during periods when fewer activities are competing for specialized resources, and reduction of work scope during outages. Maintenance activities that are planned and executed within established bounds and acceptable levels of risk maintain overall plant safety. A configuration risk assessment of planned maintenance activities is conducted prior to initiating any maintenance activity.

The director of work management is supported by an on-line manager and an outage manager and reports to the plant manager.

Functional Manager In Charge of Outages

The functional manager in charge of outages is responsible for:

- Planning and scheduling refueling, maintenance, and forced outages.
- Providing direction and guidance to staff members in establishing outage activities.
- Minimizing shutdown risk during outages with proper planning and preparation.
- Directing activities during outages to provide safe, efficient, and effective outages.

The functional manager in charge of outages reports to the director of work management described above.

Functional Manager In Charge of Online Work Management

The functional manager in charge of on-line work management is responsible for the development of the work cycle plan, the 12-week scheduling process, detailed work scheduling, and work execution.

On-line work control is based upon a 13-week cycle template containing work windows on major safety related and risk significant structures, systems, and components (SSCs). For scheduling convenience, these windows are tied to the SSC surveillance intervals. The intent of the work window is to permit the maximum bundling of maintenance tasks and minimize the number of maintenance outages on SSCs, thus minimizing SSC unavailability and optimizing reliability.

The manager in charge of on-line work management reports to the director of work management.

Functional Manager In Charge of Radiation Protection

The functional manager in charge of radiation protection 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. Radiation protection responsibilities of the functional manager in charge of radiation protection are consistent with the guidance in Regulatory Guide 8.8 and Regulatory Guide 8.10.

The functional manager in charge of radiation protection reports to the plant manager and is supported by the supervisors in radiation protection. The functional manager in charge of radiation protection receives support from the corporate radiation protection manager in nuclear support.

Supervisors In Charge of Radiation Protection

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 Section 13.1.1.1.

Supervisors in charge of radiation protection report to the functional manager in charge of radiation protection.

Radiation Protection Technicians

Radiation protection technicians (RPT's) 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 RPT's:

- As delegated authority 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.

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 that provide for effective compliance with environmental regulations. The functional manager in charge of chemistry reports to the plant manager and directly supervises the chemistry supervisors and chemistry technicians as assigned. The functional manager in charge of chemistry reports indirectly to and receives support from the corporate chemistry manager in nuclear support.

Operations Department

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

- Overall operation of station equipment
- Monitoring and surveillance of safety and non-safety related equipment.
- Fuel movement
- 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 director in charge of operations who, through the shift operations superintendent (SOS) 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 the following subsections, plant administrative procedures, and technical specifications. The minimum shift manning requirements are shown in Table 13.1-202.

Portions of the operations organization are shared between units. For instance, administrative and support personnel may perform their duties on either/or both units. Additional operations staff may be required to fill the on-shift staffing requirements of the other unit. In order to operate or supervise the operation of more than one unit, the operator (senior reactor operator [SRO] or reactor operator [RO]) must hold the appropriate, current license for each unit.

A single management organization oversees the operations group for the station. Table 13.1-201 illustrates the estimated staffing level in the operations department. Operations support is staffed with sufficient personnel to provide support activities for the operating shifts and overall operations department.

The following subsections provide an overview of the operations organization.

Operations Director

The operations department organizational relationship is shown in Figure 13.1-202. The operations director has overall responsibility for the day-to-day operation of the plant. The operations director reports to the plant manager and is assisted by the shift operating superintendent in charge of shift operations, the operations services manager, the operations support manager, and the reactor engineering manager. Either the operations director or the shift operating superintendent in charge of shift operations shall be SRO licensed on both the units.

SOS in Charge of Shift Operations

The SOS in charge of operations, under the direction of the director in charge of operations, 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 service and support managers in charge of off-shift operations 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 shift managers in charge on-shift who direct the operating shift personnel assist the shift operating superintendent in charge of operations in this area. The shift operating superintendent in charge of operations reports to the director in charge of operations and, in the absence of the director in charge of operations, the shift operating superintendent may assume the duties and responsibilities of director in charge of operations.

Operations Support Manager

The manager in charge of operations support, under the direction of the director in charge of operations, 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, for 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 assurance records.
- Coordinating operations related fire protection program activities with the engineer in charge of fire protection.

The support manager is supported by an operations procedures group and other assigned personnel to assist the manager in charge of operations support. In the absence of the director in charge of operations and/or the shift operating superintendent, the manager in charge of operations support may assume the duties and responsibilities of either of these positions.

Operations Services Manager

The operations services manager reports to the operations director.

The responsibilities of the operations services manager include:

- Development of performance standards for personnel under his/her supervision as a means of evaluating individual performance.

- Direction of the daily planners on matters relating to the day-to-day planning activities.
- Direction of the Clearance Order writers on matters relating to the day-to-day Clearance and Tagging activities.
- Responsibility for forced and refueling outage preparation and execution.
- Support of the site-wide work schedule and assurance that operations can support completion of the scheduled activities
- Assurance that critical equipment repairs have the proper priority.

The operations services manager is supported by licensed individuals (RO) to prepare clearance orders and by licensed SRO personnel to prepare and coordinate station work activities.

Shift Manager

The manager in charge on-shift is a licensed SRO responsible for the control room command function, and is the plant manager's direct management representative for the conduct of operations. As such, the manager in charge on shift 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.
- Protect the physical security of the plant.
- Prevent damage to site equipment and structures.
- Comply with the operating license.

The shift manager is in charge of and responsible for operations during their shift and for supervising and directing operating employees during a shift to ensure the work is performed according to approved procedures. This position is also responsible for coordinating maintenance activities while on shift.

The manager in charge on-shift retains this responsibility and authority until formally relieved of operating responsibilities by another licensed SRO qualified as shift manager.

Additional responsibilities of the manager in charge on-shift 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 the duties of the manager in charge on-shift 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 re-qualification activities from the standpoint of providing guidance, direction, and instruction to shift personnel.

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

Supervisor in Charge On-Shift

The supervisor in charge on-shift is a licensed SRO. The shift supervisors report directly to the shift manager. The primary function of the supervisor in charge on-shift is to administratively support the manager in charge on-shift 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 manager in charge on-shift. The unit supervisor normally resides in the main control room and directly supervises the reactor operators in the control room. The field supervisor normally functions outside the control room and provides supervision to the equipment operators. Other duties include:

- Being aware of maintenance and testing performed during the shift.
- Shutting down the reactor if conditions warrant this action.
- Informing the manager in charge on-shift 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 manager in charge on-shift in any upset situation until assistance, if required, arrives.
- Participating in operator training, retraining, and re-qualification activities from the standpoint of providing guidance, direction, and instruction to shift personnel.

Reactor Operator

The reactor operators are licensed and normally report to the unit supervisor in charge on-shift or manager in charge on-shift. They are responsible for routine plant operations and performance of major evolutions at the direction of the manager/supervisor in charge on-shift.

The RO duties 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.
- Initiating plant shutdowns or scrams or other compensatory actions when observation of plant conditions indicates a nuclear safety hazard exists or when approved procedures so direct.

Whenever there is fuel in the reactor vessel, there is at least one reactor operator 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" and conducts monitoring and operating activities in accordance with the guidance set forth in Regulatory Guide 1.114, responsibilities of the "operator at the controls" is further described in the subsection **Operations Shift Crews** below.

Equipment Operators

The equipment operators are non-licensed operators and normally report to the supervisor in charge of the shift. They are responsible for performing 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 reactor operator.
- 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 improvement and upgrading of their own performance by participating in the applicable sections of the training program.

Radwaste Operations

Radwaste operations are responsible for development, implementation, direction, and coordination of the radioactive waste program. The unit supervisor assigned to radwaste operations reports to the operations services manager. The assigned supervisor of radwaste operations coordinates radwaste operations and operators assigned to the radwaste area.

Shift Technical Advisor

The station is committed to meeting NUREG-0737 TMI Action Plan item I.A.1.1 for shift technical advisors. The Shift Technical Advisor (STA) reports directly to the manager in charge on-shift 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 's primarily function is to contribute to maximizing safety of operations 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.

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 13.1.5-202) 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.

Fire Marshall

This position reports directly to the operations support manager and functionally to the engineer in charge of fire protection. Responsibilities are as outlined in the Exelon Fire Protection Program. The fire marshall has responsibility for the effective implementation of the administrative controls regarding fire protection and prevention, and fire brigade readiness. The fire marshall:

- Performs plant inspections to ensure the effectiveness of fire protection administrative controls and housekeeping practices.
- Authorizes and monitors system impairments (including insurance carrier notifications), hot work, transient combustible control permits, and maintenance of the transient combustible log, as required by applicable administrative control procedures.
- Ensures that all fire watches and other required fire protection compensatory measures are performed.
- Ensures fire response readiness by coordinating fire brigade drills, maintaining the site-specific pre-fire plans, and ensuring fire brigade turnout gear and equipment is properly maintained.
- Ensures support agreements with local community agencies are maintained.
- Reviews scheduled fire related impairments, as necessary.
- Ensures that the content of training materials used for fire brigade, fire watch, general employee training, site-specific administrative controls, and fire response procedures are adequate.
- Investigates and reports fire incidents.
- Interfaces with site and corporate fire protection program engineers on administrative controls and fire brigade issues.
- Interfaces with Nuclear Electric Insurance Limited (NEIL) inspectors during insurance inspections.

Operations Shift Crews

Station operations are controlled and/or 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 approval of senior control room personnel. The rules of practice for control room activities, as described by administrative

procedures, which are based on Regulatory Guide 1.114, are performed in accordance with 10 CFR 50.54. The rules of practice for control room activities include, as a minimum, the following:

- Only licensed operators and senior operators may manipulate reactivity controls except as allowed for training under 10 CFR Part 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.
- During operation of the facility in modes other than cold shutdown or refueling a senior operator shall be in the control room and a licensed operator or senior operator shall be present at the controls.

Operating Shift Crews

Plant administrative procedures implement the required shift staffing. These procedures 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. Shift staffing requirements defined by TMI Action Plan I.A.1.3 are retained in station procedures. When overtime is necessary the provisions in the technical specifications and the plant administrative procedures apply. Shift crew staffing plans may be modified during refueling outages to accommodate safe and efficient completion of outage work in accordance with the proceduralized work hour limitations.

The minimum composition of the operating shift crew is contingent upon the unit operating status. Position titles, license requirements and minimum shift manning for various modes of operation are contained in Technical Specifications, administrative procedures, and Table 13.1-202, and illustrated in Figure 13.1-202.

VCS COL 9.5.1-10-H **Fire Brigade**

The station is designed and the fire brigade is 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 does not include the shift manager in charge on shift, the STA, nor any other members of the minimum shift operating crew necessary for safe shutdown of the unit. It does not 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 station fire brigade is comprised of qualified individuals. The qualification consists of initial and refresher fire brigade training.

13.1.3 Qualifications of Nuclear Plant Personnel

13.1.3.1 Qualification Requirements

Qualifications of managers, supervisors, operators, and technicians of the operating organization meet the qualification requirements in education and experience for those described in ANSI/ANS-3.1-1993 (Reference 13.1.5-201), as endorsed and amended by Regulatory Guide 1.8, except for cold license operators as discussed in Appendix 13BB.

13.1.3.2 Qualifications of Plant Personnel

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

13.1.4 COL Information

13.1-1-A Organizational Structure

VCS COL 13.1-1-A This COL item is addressed in Subsections 13.1.1 through 13.1.3.

13.1.5 References

13.1.5-201 American Nuclear Society, *American National Standard for Selection, Qualification, and Training of Personnel for Nuclear Power Plant*, ANSI/ANS -3.1-1993.

13.1.5-202 U.S. Nuclear Regulatory Commission, *Generic Letter 86-04, Policy Letter, Engineering Expertise on Shift.*

13.1.5-203 American Nuclear Society, *American National Standard for Administrative Controls and Quality Assurance for the Operational Phase of Nuclear Power Plants*, N18.7-1976/ANS-3.2

VCS COL 13.1-1-A

Table 13.1-201 (Sheet 1 of 6)
Generic Position/Site Specific Position Cross Reference

Nuclear Function	Function/Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents[a]			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
Executive management							
	chief nuclear officer	(n/a)	CNO Exelon	1[b]	1[b]	1[b]	1[b]
	senior executive, nuclear operations	(n/a)	Chief Operating officer, Nuclear Operations	1**	1**	1[b]	1[b]
	senior executive, nuclear operations	(n/a)	Sr Vice President Operations	2[b]	2[b]	2[b]	2[b]
	site executive	(n/a)	Site Vice President — VCS	1	1	1	1
Nuclear support							
	executive, operations support	(n/a)	Vice President, Nuclear Support	1[b]	1[b]	1[b]	1[b]
	executive, construction	(n/a)	Vice President, New Plant Development	1[b]	1[b]	1[b]	1[b]
	executive, engineering and technical services	(n/a)	Sr Vice President, Engineering and Technical Services	1[b]	1[b]	1[b]	1[b]
Plant management							
	plant manager	(4.2.1)	Plant Manager	—	—	1	1
	safety and licensing manager	(n/a)	Regulatory Assurance Manager	—	—	1	1
Operations							
	manager	(4.2.2)	Operations Director	—	—	1	1
operations, plant	functional manager	(4.3.8)	Shift Operations Superintendent	—	—	1	1
operations, admin	functional manager	(4.3.8)	Operations Services and Support managers	—	—	2	2

Table 13.1-201 (Sheet 2 of 6)
Generic Position/Site Specific Position Cross Reference

Nuclear Function	Function/Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents[a]			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
reactor engineering	functional manager	(4.3.9)	Reactor Engineering Manager	—	—	1	1
	reactor engineer	(4.6 — staff engineer)	Reactor Engineer	—	1	3	3
Operations (continued)							
operations, (on-shift)	functional manager	(4.4.1)	Shift Manager	—	—	6	12
	supervisor)	(4.4.2)	Unit Supervisor	—	—	5	12
	supervisor	(4.4.2)	Field Supervisor	—	—	5	6
	supervisor	(4.6.2)	STA[c]	—	—	5	12
	licensed operator	(4.5.1)	Control Room Operator	—	—	15	24
	non-licensed operator	(4.5.2)	Equipment Operator	—	6	24	47
	rad waste operator	(4.5.2)	Rad Waste Operator	—	—	1	12
Engineering							
	manager	(4.2.4)	Engineering Director	1	1	1	1
projects	functional manager	(4.3.9)	Manager, Projects	—	1	1	1
	projects engineer	(n/a)	Projects manager	1	3	3	5
system engineering	functional manager	(4.3.9)	Sr Manager, Plant Engineering	—	1	1	1
	function manager	(4.3.9)	Plant Engineering managers	—	—	3	3
	system engineer	(4.6.1)	System Engineer	1	10	18	27
design engineering	functional manager	(4.3.9)	Sr Manager, Design Engineering	1	1	1	1
	functional manager	(4.3.9)	Design managers	3	3	3	3
	design engineer	(4.6 — staff engineer)	Design Engineer	2	8	20	30

Table 13.1-201 (Sheet 3 of 6)
Generic Position/Site Specific Position Cross Reference

Nuclear Function	Function/Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents[a]			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
safety and engineering analysis	functional manager	(4.3.9)	Engineering Programs Manager	—	1	1	1
	analysis engineer	(4.6 — staff engineer)	Analysis Engineer	—	1	1	1
Engineering (continued)							
engineering programs	functional manager	(4.3.9)	Manager, Engineering Programs	—	1	1	1
	programs engineer	(4.6 — staff engineer)	Programs Engineer	—	5	10	10
Chemistry							
	functional manager	(4.3.2)	Chemistry Manager	—	1	1	1
	supervisor	(4.4.5)	Chemistry Supervisor	—	1	2	3
	technician	(4.5.3.1)	Chemistry Technician	—	2	6	14
Radiation Protection							
	functional manager	(4.3.3)	Radiation Protection Manager (RPM)	—	1	1	1
	supervisor	(4.4.6)	RP Supervisor	—	1	2	4
	technician	(4.5.3.2)	RP Technician	—	4	10	24
	ALARA specialist	(n/a)	ALARA Specialist	—	1	3	3
	decon technician	(n/a)	Decon Technician	—	2	6	13
Maintenance							
	manager	(4.2.3)	Maintenance Director	—	—	1	1

Table 13.1-201 (Sheet 4 of 6)
Generic Position/Site Specific Position Cross Reference

Nuclear Function	Function/Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents[a]			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
instrumentation and control	supervisor	(4.4.7)	Manager, Instrumentation and Control	—	1	1	1
	supervisor	(4.4.7)	Supervisor, Instrumentation and Control	—	2	3	5
	technician	(4.5.3.3)	Instrumentation and Control Technician	—	6	25	55
Maintenance (continued)							
mechanical	supervisor	(4.4.9)	Manager, Mechanical	—	1	1	1
	supervisor	(4.4.9)	Supervisor, Mechanical	—	2	3	5
	technician	(4.5.7.2)	Mechanic	—	10	30	61
electrical	supervisor	(4.4.8)	Manager, Electrical	—	1	1	1
	supervisor	(4.4.8)	Supervisor, Electrical	—	2	2	2
	technician		Electrician	—	4	20	25
Work Planning							
	functional manager	(4.3)	Supervisor, Planning	—	1	2	4
	technicians	(4.5.7.1)	Work Planners	—	2	6	11
Planning and Scheduling and outage							
	manager	(4.2)	Director of work management	—	—	1	1
	functional manager	(4.3)	Outage Manager	—	—	1	1
	functional manager	(4.3)	Manager on-line Scheduling	—	—	1	1
			Work week schedulers and planners	—	2	10	19
Purchasing, and contracts							
	functional manager	(4.3)	Manager, Supply Chain	—	1	1	1

Table 13.1-201 (Sheet 5 of 6)
Generic Position/Site Specific Position Cross Reference

Nuclear Function	Function/Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents[a]			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
	procurement engineer	(n/a)	Procurement Engineer	—	1	2	2
Quality assurance							
	functional manager	(QAPD)	Nuclear Oversight Manager	1	1	1	1
	QA lead auditor	(QAPD)	QA Lead Assessor	1	1	1	1
	QA internal auditor	(QAPD)	QA Assessors	—	2	2	4
	QA internal auditor	(QAPD)	QA Auditors	—	2	2	3
	QC inspector	(QAPD)	QC Inspector	—	6	6	3
	supplier auditor	(QAPD)	Nuclear Quality Inspector	—	2	2	1[d]
	vendor surveillance QC inspector	(QAPD)	Vendor Surveillance QC Inspector	2	6	4	4[d]
	nuclear fuel inspector	(QAPD)	Nuclear Fuel Inspector	—	3[d]	3[d]	3[d]
Training							
	functional manager	(4.3.1)	Training Director	—	1	1	1
	supervisor operations training	(4.4.4)	Manager, 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	16	19
	supervisor tech staff training	(4.4.4)	Manager, Tech Training	—	1	1	1
	supervisor maintenance training	(4.4.4)	Supervisor, Maintenance Training	—	1	1	1
	tech staff/maintenance instructors	(4.5.4)	Tech Staff/Maintenance Instructor	—	2	4	6
Nuclear safety assurance							

Table 13.1-201 (Sheet 6 of 6)
Generic Position/Site Specific Position Cross Reference

Nuclear Function	Function/Position (ANS-3.1-1993 section)		Nuclear Plant Position (Site-Specific)	Estimated Numbers of Full Time Equivalents[a]			
				Design Review Phase	Construction Phase	Pre-op Phase	Operational Phase
licensing	functional manager	(4.3)	Regulatory Assurance Manager	1	1	1	1
	licensing engineer	(n/a)	Licensing Engineer	3	4	4	4
corrective action	functional manager	(4.3)	Corrective action program manager	—	1	1	1
	corrective action engineer		Station Nuclear Safety Engineer	—	1	1	1
Nuclear Protection Services							
fire protection	supervisor	(4.4)	Fire Marshall	—	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)	Security Manager	—	1[d]	1[d]	1[d]
	first line supervisor	(4.4)	Supervisor, Nuclear Security	—	10[d]	10[d]	10[d]
	security officer	(n/a)	Security Officer	—	100[d]	100[d]	100[d]
Startup testing							
	supervisor	(4.4.12)	Startup Testing Supervisor	—	1	3	0
	startup test engineer		Startup Test Engineer	—	4	10	0
	supervisor	(4.4.11)	Preop Testing Supervisor	—	2	6	—
	preop test engineer	(n/a)	Preop Test Engineer	—	8	25	—

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

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

c. 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 may also serve as the STA. If this option is used for a shift, the separate STA position may be eliminated for that shift.

d. Shared position with other Exelon units.

Table 13.1-202
Minimum Shift Staffing for each Unit

Unit Shutdown	1 SM (SRO) 1 RO 1 EO
Unit Operating*	1 SM (SRO) 1 SRO 2 RO 2 EO
SM – shift manager SRO – Licensed Senior Reactor Operator	RO – Licensed Reactor Operator EO– 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 13.1.5-202), 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 radiation protection 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.

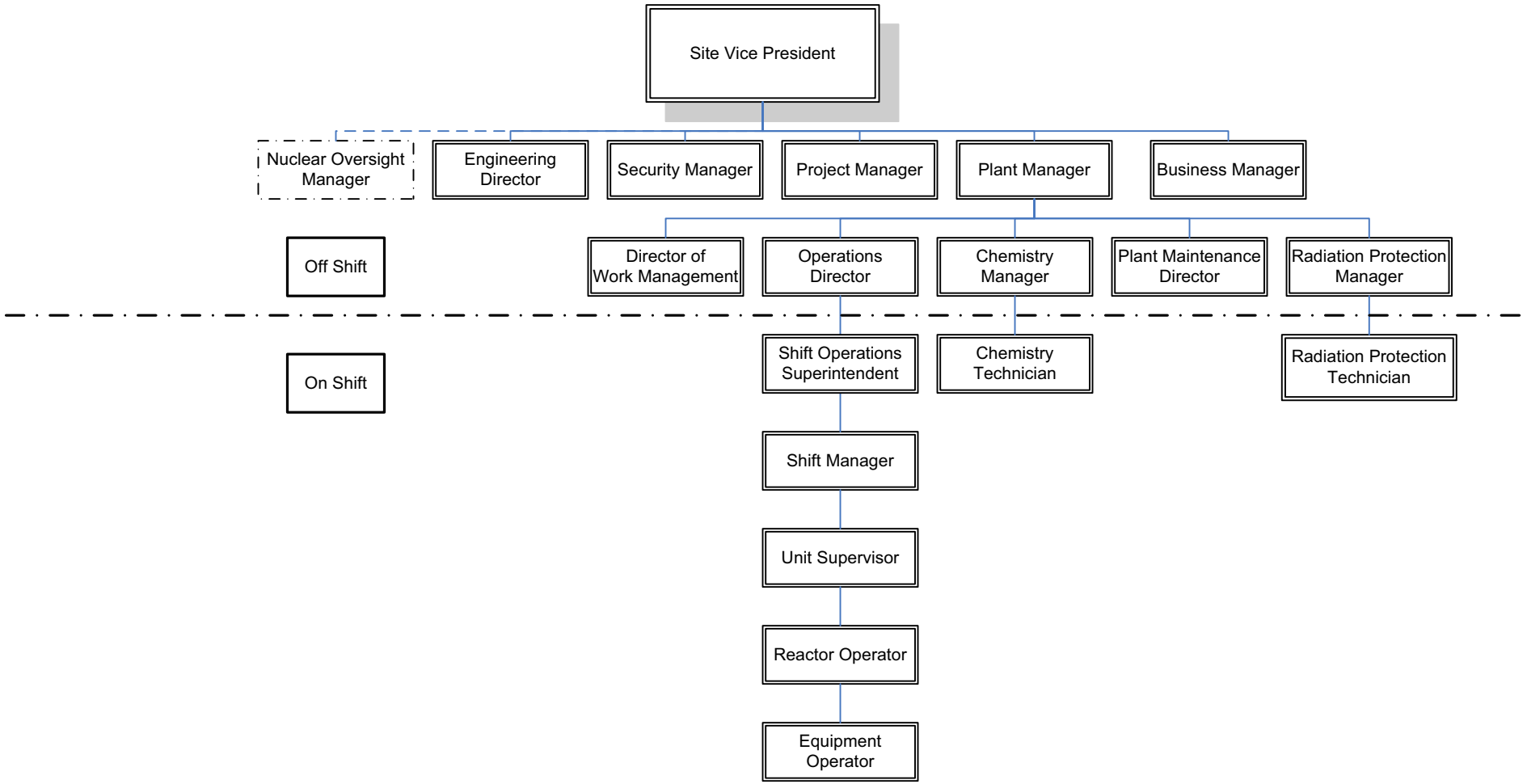

Figure 13.1-201 Plant Management Organization

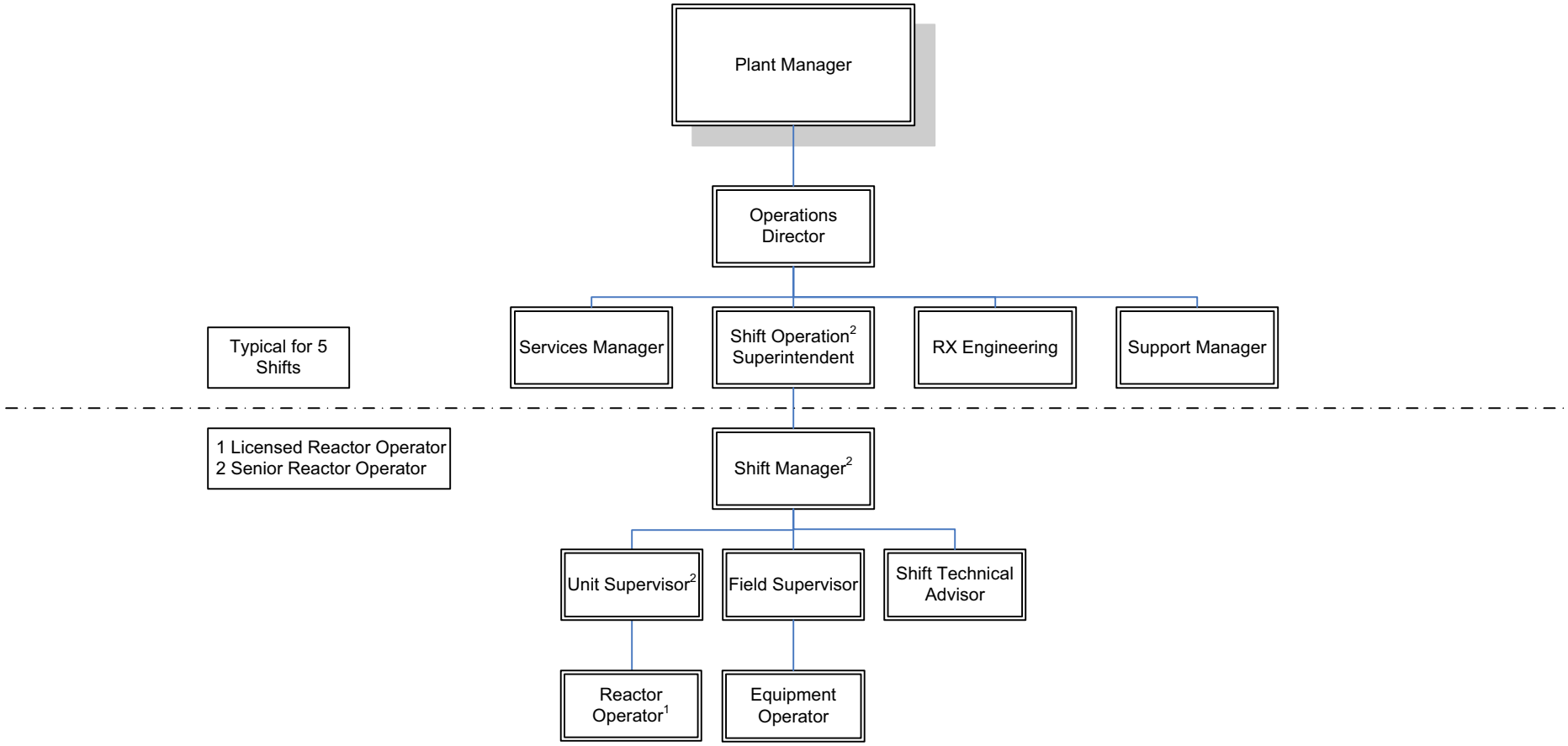

Figure 13.1-202 Shift Operations

Figure 13.1-203 Corporate and Engineering Organization

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:

VCS 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 shown in Appendix 13AA. 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:

VCS 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 shown in Appendix 13AA.

13.2.5 COL Information

13.2-1-A **Reactor Operator Training**

VCS COL 13.2-1-A

This COL item is addressed in Section 13.2.1, Appendix 13AA, and Appendix 13BB.

13.2-1-A **Training for Non-Licensed Plant Staff**

VCS COL 13.2-2-A

This COL item is addressed in Section 13.2.2, Appendix 13AA, 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.

13.3-1-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.

13.3-1-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.

13.4-1-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.

STD COL 13.4-1-A
STD COL 13.4-2-A

Table 13.4-201 (Sheet 1 of 5)
Operational Programs Required by NRC Regulations

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)
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)
3.	Environmental Qualification Program	10 CFR 50.49(a)	3.11	Prior to fuel load	License Condition
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)
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
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
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

STD COL 13.4-2-A

Table 13.4-201 (Sheet 2 of 5)
Operational Programs Required by NRC Regulations

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
9.	Process and Effluent Monitoring and Sampling Program:				
	Radiological Effluent Technical Specifications/Standard Radiological Effluent Controls	10 CFR 20.1301 and 20.1302 10 CFR 50.34a 10 CFR 50.36a 10 CFR 50, Appendix I, Section II and IV	11.5.4.6	Prior to fuel load	License Condition
	Offsite Dose Calculation manual	Same as above	11.5.4.5 11.5.4.8	Prior to fuel load	License Condition
	Radiological Environmental Monitoring Program	Same as above	11.5.4.5	Prior to fuel load	License Condition
	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

STD COL 13.4-2-A

Table 13.4-201 (Sheet 3 of 5)
Operational Programs Required by NRC Regulations

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 Prior to fuel receipt for those elements of the RP Program necessary to support receipt and storage of fuel onsite Prior to fuel load for those elements of the RP Program necessary to support fuel load and plant operation Prior to first shipment of radioactive waste for those elements of the RP Program necessary to support shipment of radioactive waste	License Condition
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
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)

STD COL 13.4-2-A

Table 13.4-201 (Sheet 4 of 5)
Operational Programs Required by NRC Regulations

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	**Requirement**
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)			
	Physical Security Program	10 CFR 73.55 10 CFR 73.56 10 CFR 73.57	13.6	Prior to fuel receipt	License Condition
	Safeguards Contingency Program	10 CFR 50.34(d) 10 CFR 73, Appendix C	13.6	Prior to fuel receipt	License Condition
	Training and Qualification Program	10 CFR 73, Appendix B	13.6	Prior to fuel receipt	License Condition
	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
	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
	Fitness for Duty (Operation)	10 CFR 26	13.7	Prior to fuel receipt	License Condition

STD COL 13.4-2-A

Table 13.4-201 (Sheet 5 of 5)
Operational Programs Required by NRC Regulations

Item	Program Title	Program Source (Required by)	Section	Implementation	
				Milestone	Requirement
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)
18.	Motor-Operated Valve Testing	10 CFR 50.55a(b)(3)(ii)	3.9.6	Prior to fuel load	License Condition
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 60 days prior to the scheduled date of the first preoperational test for the Preoperational Test Program 60 days prior to the scheduled date of initial fuel loading for the Startup Test Program	License Condition

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 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.

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 Section 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 Section 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 Section 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 Section 13.5.2.1.

Replace the last sentence of Section 13.5.2 with the following:

STD COL 13.5-3-A Emergency Procedures are developed in accordance with Section 13.5.2.1.4.

Add the following at the end of Section 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.

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.

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.

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. 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 Section 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. An initial program based on service conditions, experience with comparable equipment and vendor

recommendations is developed prior to fuel loading. 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.

13.5-1-A Plant Operating Procedures Development Plan

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

13.5-1-A Emergency Procedures Development

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

13.5-1-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.

13.5-1-A Procedures for Calibration, Inspection, and Testing

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

13.5-2-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.

STD SUP 13.5-39

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

(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

STD COL 13.5-1-A

Table 13.5-202
Nominal Procedure Development Schedule

(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.

VCS SUP 13.7-1

13.7 Fitness For Duty

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 onsite construction of safety- or security-related SSCs. The operations phase program is consistent with NEI 03-01 (Reference 13.7-202), which is currently under NRC review. 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.

13.7-202 Nuclear Energy Institute (NEI) *Nuclear Power Plant Access Authorization Program*, NEI 03-01.

VCS SUP 13AA-1

Appendix 13AA Construction-Related Organization

The information in this appendix is included for future designation as historical information. Paragraphs are numbered to be subsequent to Subsection 13.1.1.1 and immediately preceding the subsection article entitled **Provisions for Technical Support Functions**.

13AA.1.1 Design and Construction Activities

General Electric-Hitachi Nuclear Energy was selected to design, fabricate, deliver, and install the ESBWR advanced light water boiling water reactor (BWR) and to provide technical direction for installation and startup of this equipment. DCD Subsection 1.4 provides detailed information regarding GE past experience in design, development, and manufacturing of nuclear power facilities. Operating experience from design, construction, and operation of earlier GE BWR's is applied in the design, construction, and operation of the ESBWR as described in numerous locations throughout the DCD.

A construction architect engineer (AE) provides the construction of the plant and additional design engineering for selected site-specific portions of the plant. The AE is selected based on experience and proven technical capability in nuclear construction projects or projects of similar scope and complexity. Other design and construction activities are generally contracted to qualified suppliers of such services. Implementation or delegation of design and construction responsibilities is described in the subsections below. Quality assurance aspects of these activities are described in Chapter 17.

13AA.1.2 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. During construction, foundations within the power block area are mapped or visually inspected and photographed. 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.

13AA.1.3 Design of Plant and Ancillary Systems

Responsibility for design and construction of systems outside the power block such as circulating water, service water, switchyard, and secondary fire protection systems are delegated to qualified contractors.

13AA.1.4 Review and Approval of Plant Design Features

Design engineering review and approval is performed in accordance with the reactor technology vendor QA program and Section 17.1. The reactor technology vendor is responsible for design control of the power block. 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 and site support for review. As systems are tested and approved for turnover and operation, control of design is turned over to plant staff.

The director in charge of engineering, along with functional managers and staff, assume 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 director 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 Chapter 18. See Organization Charts, Figures 13.1-201 and 13.AA-201 for reporting relationships.

13AA.1.5 Site Layout With Respect to Environmental Effects and Security Provisions

Site layout was considered when determining the expected environmental effects from construction. The Physical Security Plan is designed with provisions that meet the applicable NRC regulations. Site layout was considered when developing the Security Plan.

13AA.1.6 Development of Safety Analysis Reports

Information regarding the development of the Final Safety Analysis Report is found in Chapter 1.

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

Safety-related material and component specifications of structures, systems, and components designed by the reactor technology vendor are reviewed and approved in accordance with the reactor technology 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 Quality Assurance Program Document.

13AA.1.8 Procurement of Materials and Equipment

Procurement of materials during construction phase is the responsibility of the reactor technology 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 manager in charge of quality assurance.

13AA.1.9 Management and Review of Construction Activities

Overall management and responsibility for construction activities is assigned to the site executive in charge of project build. The project directors of the engineering, procurement, and construction (EPC) new plant development contractor are accountable to the site executive in charge of project build for the various construction activities. See Organization Chart Figure 13.AA-201. 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 contractors are in compliance with contractual obligations for quality, schedule, and cost. Monitoring and review of construction activities is divided functionally across the various disciplines of the utility construction staff, e.g. 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 they will be responsible for completion of construction activities as directed by plant

staff and available to provide support for preoperational and start-up testing as necessary.

13AA.2.1 Preoperational Activities

The project startup manager reports to the site executive in charge of plant management. The startup manager, with the aid of those managers that report directly to the position, (see Figure 13.AA-201) is responsible for 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, procedure development for tests, fuel load, integrated startup testing, and turnover of systems to plant staff.

The plant operation readiness and transition manager reports to the site executive in charge of plant management. The plant operation readiness and transition manager is responsible for programs and process

13AA.2.2 Development of Human Factors Engineering

Design Objectives and Design Phase Review of Proposed Control Room Layouts

Human factors engineering (HFE) design objectives are initially developed by the reactor technology vendor in accordance with Chapter 18 of the FSAR and the Design Control Document (DCD). As a collaborative team, personnel from the reactor technology 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 Design Control Document are reviewed per engineering and site support procedures, as required by DCD Section 18.2, to evaluate the impact to plant safety. The director in charge of engineering is responsible for the human factors engineering (HFE) design process and for the design commitment to HFE during construction and throughout the life of the plant as noted in Subsection 13.1.1.1.

The HFE program is established in accordance with the description and commitments in Chapter 18.

13AA.2.3 Preoperational and Startup Testing

Preoperational and startup testing is conducted by the plant test and operation project startup organization. The project startup organization, functions, and responsibilities are addressed in Section 14.2. 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. To improve operational experience, operations and technical staff are used as support in conducting the test program and in reviewing test results. See Figure 13.AA-201 for organization chart for the construction organization responsible for preoperational and startup testing.

13AA.2.4 Development and Implementation of Staff Recruiting and Training Programs

Staffing plans are developed based on operating plant experience with input from the reactor technology vendor for safe operation of the plant as determined by HFE. See Section 18.6. These plans are developed under the direction and guidance of the site executive in charge of plant management, executive in charge of engineering and technical services, and executive in charge of operations support. Staffing plans are completed and manager level positions are 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.AA-202 for an estimated timeline of hiring requirements for operator and technical staff relative to fuel load. 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; however, Table 13.1-201 includes the initial estimated number of staff for selected positions and the estimated number of additional positions required for the second unit. 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 for these individuals is described in Section 13.2.

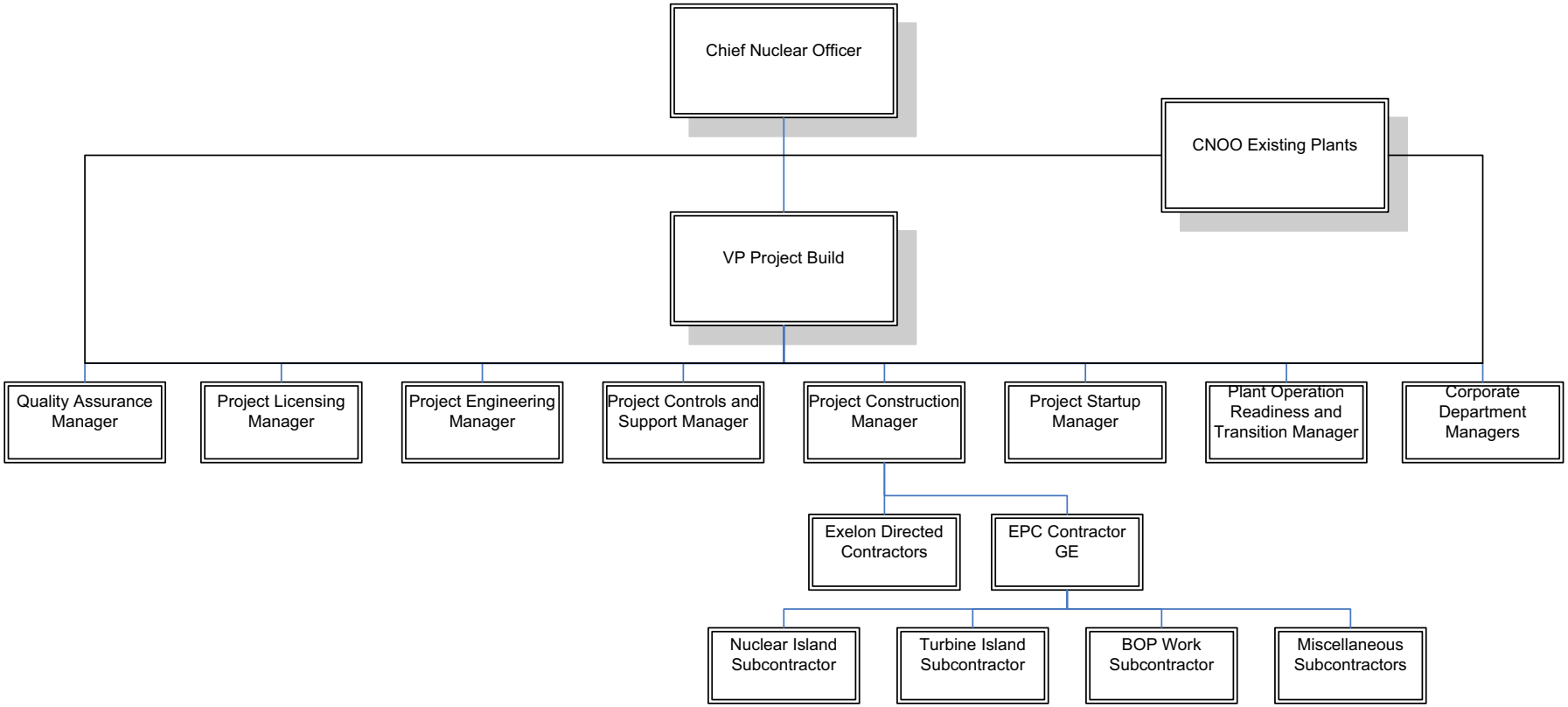

Figure 13.AA-201 Exelon Integrated Construction Organization

TO BE PROVIDED 18 MONTHS PRIOR TO FUEL LOAD

Figure 13.AA-202 Exelon Estimated Hiring Timeline for VCS Units 1 and 2

The following new appendix is inserted as supplemental information to NEI 06-13, which is incorporated by reference in Section 13.2.

VCS SUP 13BB-1

Appendix 13BB Standard Supplement To Generic Template NEI 06-13

Insert the following paragraphs into the text of NEI 06-13 (Revision 0 - A), October 2006 after the paragraph numbered 1.1.2 of that document.

13BB.1 Licensed Operator Training Program Prior to Commercial Operation

Prior to initial commercial operation, licensed operator training will be conducted 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" license operator training. Cold license operator training will be conducted as described in Section 1.1.1 of the relevant NEI 06-13. 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 Regulatory Guide 1.8 (Revision 3) and ANS/ANSI 3.1-1993 can not be met. Therefore, during cold license operator training, the Regulatory Position C.1.b of Regulatory 1.8 (Revision 2) applies: cold license operator candidates will meet the training elements defined in ANS/ANSI 3.1 but are exempt from the experience requirements defined in ANS/ANSI 3.1. Alternate methods of gaining plant experience, in addition to those referenced in Regulatory Guide 1.8 and associated ANS/ANSI standards, are described in Subsection 13BB.1.2.

Approximately 18 months prior to expected fuel load, the NRC examination will be administered for cold license operator candidates and will include a written examination, simulator examination, and in-plant job performance measures (JPM's). Sufficient operator licenses will be obtained to support operational shifts prior to first fuel load.

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

13BB.1.1 Licensed Operator Continuing Training Prior to Commercial Operation

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

An accredited licensed operator requalification training program will be implemented within 90 days following the issuance of the first NRC operator licenses. This will facilitate maintaining the licensed operators' knowledge and ability and meet the milestone guidance related to the Reactor Operator Requalification Training Program provided in Section C.I.13.4, "Sample FSAR Table 13.4-201 — Operational Program Required by NRC Regulation and Program Implementation" Item No. 13, of Regulatory Guide 1.206.

13BB.1.2 Licensed Operator Experience Requirements Prior to Commercial Operation

Each cold license 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 will notify the NRC when the candidate's experience requirements have been met. Experience may be gained anytime prior to fuel load by participating in construction and testing activities. Operational experience on a one-for-one basis may be 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 (OJT) instructor

The above practical work assignments provide experience and may fulfill the one-year on-site experience requirement cited in Regulatory Guide 1.8 and the three month on-shift requirement cited in ANS/ANSI 3.1. On-site experience may also be gained on a one-for-one basis at a nuclear reactor site of similar design (e.g., 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 requirement of one year onsite experience and the requirement of six months as a non-licensed operator at the facility for which the license is sought, both of which are cited in Regulatory Guide 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 Regulatory Guide 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 Regulatory Guide 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 ANS/ANSI 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.

13BB.1.3 On-the-Job Training (OJT) Prior to Commercial Operation

Until equipment installation is sufficiently complete, viable alternatives for performance of in-plant JPM's will be identified including, but not limited to, discussions, mockups, virtual presentations and part-task simulation. Time spent in OJT training may be counted as on-site and total nuclear power plant experience.

Until the plant becomes operational, viable alternatives for the main control room OJT (3 months on-shift as an extra person) will be 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.

13BB.1.4 Plant-Referenced Simulation Facilities Prior to Commercial Operation

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

Simulation models are updated as information concerning plant design and performance is obtained. These updates will 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.

- 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.
- 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.
- Phase 3 (approximately 18 months prior to fuel load) — ANSI/ANS 3.5 1998 plant referenced simulator is used for performance of NRC operator initial license examinations.

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