13.1 ORGANIZATIONAL STRUCTURE

This section describes the organization of FPL Energy Seabrook, LLC (FPLE Seabrook). FPLE Seabrook is an indirect, wholly-owned subsidiary of FPL Energy, LLC, the independent power producer subsidiary of FPL Group, Inc. FPL Group affiliates operate, and have ownership interests in, four other nuclear units besides Seabrook Station. These are St. Lucie Units 1 and 2 and Turkey Point Units 3 and 4 in Florida operated by Florida Power and Light Company (FP&L). While FPLE Seabrook does not rely on other organizations to establish its technical qualifications, additional support is available from FP&L's Nuclear Division. Contracts may also be established with third parties (e.g., NSSS, AE) for support services. Notwithstanding any service that may be provided to Seabrook Station by FP&L or third parties, FPLE Seabrook remains responsible, at all times, for the management, operation and maintenance of Seabrook Station.

13.1.1 Management and Technical Support Organization

FPLE Seabrook is responsible for the operation and maintenance of Seabrook Station. The Senior Vice President, Nuclear and Chief Nuclear Officer has final site authority and responsibility for the overall safe operation and maintenance of Seabrook Station. This responsibility has been delegated to the Site Vice President who is the management official in overall charge of the station.

The following provides a description of the FPLE Seabrook organization associated with the operation of Seabrook Station:

a. Senior Vice President, Nuclear and Chief Nuclear Officer

The Senior Vice President, Nuclear and Chief Nuclear Officer has overall responsibility for Seabrook Station, including plant operations, maintenance, licensing, engineering, training and support services. He has assigned responsibility for plant operations, maintenance and licensing to the Vice President Nuclear Operations. He has assigned responsibility for the other functions to offsite management as follows: engineering to the Vice President Nuclear Engineering and training to the Vice President Nuclear Operations Support. Additionally, responsibility for materials management, emergency preparedness, human resources, information technology, and communications and community relations have also been assigned to offsite management at Juno Beach.

b. Vice President Nuclear Operations

The Vice President Nuclear Operations, reporting to the Senior Vice President, Nuclear and Chief Nuclear Officer has overall responsibility for Seabrook Station plant operations, maintenance, licensing and support services. The Vice President Nuclear Operations has assigned responsibility for these activities to the Site Vice President.

c. Site Vice President

The Site Vice President, reporting to the Vice President Nuclear Operations, is responsible for overall activities associated with Seabrook Station, including Plant Operations, Maintenance, Licensing and Support Services. The Site Vice President has assigned day to day responsibility for these activities to the Station Director and the Regulatory Programs Manager.

d. Vice President Nuclear Engineering

The Vice President Nuclear Engineering, reporting to the Senior Vice President, Nuclear and Chief Nuclear Officer is responsible for nuclear plant design and engineering support.

e. Vice President Nuclear Operations Support

The Vice President Nuclear Operations Support - Juno Beach, reporting to the Senior Vice President, Nuclear and Chief Nuclear Officer is responsible for administration of the Operator Training Program and the technical and administrative staff training programs.

f. Director of Nuclear Assurance

The Director of Nuclear Assurance - Juno Beach, reporting to the Senior Vice President, Nuclear and Chief Nuclear Officer is responsible for the overall implementation of the Operational Quality Assurance Program at Seabrook Station.

g. Senior Director, Nuclear Supply Chain

The Senior Director, Nuclear Supply Chain - Juno Beach, reporting to the Vice President Integrated Supply Chain has overall responsibility for inventory, procurement engineering, purchasing, contracts, and receipt inspection activities at Seabrook Station. The Vice President Integrated Supply Chain reports to the Senior Vice President Engineering, Construction and Corporate Services.

h. Station Director

The Station Director – Seabrook, reporting to the Site Vice President, is responsible for the operation, maintenance and operational support (e.g., work and outage control, chemistry and health physics) of Seabrook Station.

i. Senior Project Manager

The Senior Project Manager, reporting to the Vice President Nuclear Projects, is responsible for projects and plant modifications.

j. Manager of Engineering

The Manager of Engineering, reporting to the Vice President Nuclear Engineering, is responsible for FPLE Seabrook engineering design, engineering support, configuration management, plant engineering, capital projects engineering, and configuration control.

k. Regulatory Programs Manager

The Regulatory Programs Manager, reporting to the Site Vice President, is responsible for the management of NRC licensing compliance and generic licensing activities. The Regulatory Programs Manager is also responsible for the overall direction of nonradiological environmental compliance and owner relations.

l. Nuclear Oversight

The Nuclear Oversight Manager, reporting to the Director of Nuclear Assurance - Juno Beach, is responsible for independent oversight of FPLE Seabrook activities and for the Concerns Resolution Program.

The Concerns Resolution Program Site Specialist, reporting to the Nuclear Oversight Manager, is responsible for the administration of the nuclear safety concerns program.

m. Manager of Materials Management

The Manager of Materials Management reports to the Senior Director, Nuclear Supply Chain - Juno Beach. The Manager of Materials Management is responsible for inventory, procurement engineering, purchasing, contracts, and receipt inspection.

The internal corporate organizational relationships are shown in the Quality Assurance Topical Report. Resumes of corporate management personnel are available upon request.

Westinghouse, United Engineers and Constructors (UE&C) and General Electric are three other organizations that had major responsibilities for the design and construction of the Seabrook project. Westinghouse was responsible for the design, fabrication and delivery of the Nuclear Steam Supply System, related auxiliary systems and the nuclear fuel. Technical direction for the installation of the equipment and technical assistance throughout the preoperational testing, initial core loading and power escalation testing programs were further responsibilities of Westinghouse. United Engineers and Constructors (UE&C) were responsible for construction phase engineering, design and certain construction activities of the station. Included in their services were furnishing the balance-of-plant systems and components, structures and switchyards so that a complete and integrated facility resulted. General Electric was responsible for the design, fabrication and delivery of the turbine-generator unit.

13.1.1.1 Seabrook Station Organization, Responsibilities and Authority

The Seabrook Station organization is under the overall direction of the Senior Vice President, Nuclear and Chief Nuclear Officer, who has overall responsibility for the operation and operational support for Seabrook Station. The Site Vice President, reporting to the Senior Vice President, Nuclear and Chief Nuclear Officer, has overall charge of the station. The Station Director, reporting to the Site Vice President, is responsible for day to day activities associated with operation and maintenance of the station.

The responsibilities, training, organization and qualifications of the Station Staff are discussed in Subsection 13.1.2. The responsibilities of the Training Staff are discussed in Subsection 13.1.1.2.

13.1.1.2 Seabrook Training Organization, Responsibilities and Authority

FPLE Seabrook has recognized the importance of training by establishing training facilities and by providing a Seabrook site-specific simulator. The Training Center is located on the Seabrook site outside of the protected area.

The training facilities contain classrooms, office space, a library, study areas, instructor material preparation rooms, a computer room, administrative areas, and a simulated Seabrook control room with a full-size main control board and various main control room panels. The simulator control board was manufactured by Link, a division of the Singer Company. Link has had extensive experience with nuclear simulators and a myriad of simulators for military applications. Seabrook represents the eighteenth simulator built by Link for the nuclear industry. The simulator control room is not only similar to the actual control room in appearance, but is also operated under the same working conditions as the actual main control room to provide a realistic atmosphere for operator training.

The Nuclear Training Manager reports to the Vice President of Nuclear Operations Support - Juno Beach. The training organization is shown in Figure 13.1-3. Resumes of key training personnel are available upon request.

Operator training is performed under the cognizance of the Operations Training Supervisor who is responsible for implementation of the License Training and Requalification Training Programs as discussed in Subsection 13.2.1. The training program for instructors is identical in scope to the Seabrook operator training required for a Senior Operator license, except that instructors are provided additional training on simulator control functions to improve teaching skills.

Training for technical and management staff is performed by the Training Department. This function is further discussed in Subsection 13.2.2.

13.1.2 Operating Organization

13.1.2.1 Station Organization

The Seabrook Station organization chart is shown in Figure 13.1-4. The station organization includes all the technically trained personnel necessary to support all aspects of Unit 1 operation.

The key supervisory positions for the station organization were filled in 1979. Personnel to meet the operational requirements of Unit 1 were hired on a phased basis consistent with the training and licensing requirements of the individual positions.

The Unit 1 on-duty operating shift crews are composed as shown in Technical Specification Table 6.2-1, and meet the requirements outlined in Technical Specification Subsection 6.2.2 describing the plant organization. Manpower necessary to staff six shift crews is provided. Each member of the station organization meets, or exceeds, the minimum qualifications recommended for comparable positions in Regulatory Guide 1.8, Revision 2, except ANSI/ANS 3.1-1978 is used as the standard rather than ANS 3.1 ANSI 18.1-1971, and except for those positions specifically identified in Reg. Guide 1.8, Rev. 2, that comply with ANSI/ANS 3.1-1981.

A retraining and replacement licensed training program for the Station Staff shall be maintained under the direction of the Training Manager in accordance with the Seabrook Station Institute of Nuclear Power Operations (INPO) Accredited Programs.

The employees assigned to the station organization have been trained as described in Section 13.2.

13.1.2.2 Station Personnel Responsibilities and Authorities

a. Overall Station Management

The Site Vice President is responsible for overall management of Unit 1, including operation and maintenance.

The Station Director is responsible for day to day activities associated with operation and maintenance of Unit 1. In his absence, the Assistant Plant Manager will assume these responsibilities. The Shift Manager assumes these responsibilities when station management is not within the station. In addition, the Station Director may designate in writing other qualified personnel to assume these responsibilities in his absence.

The Station Director reports to the Site Vice President for all activities related to the station. Reporting to the Station Director are the following:

1. Assistant Plant Manager
2. Maintenance Manager
3. Work Control Manager
4. Performance Improvement Manager

Responsibilities for the above positions are described in Section 17.2. The functions, responsibilities and authorities for station positions under the direct cognizance of these managers are defined below.

b. Operations

The Assistant Plant Manager is responsible for the operation of the station. He maintains close communications with the other managers regarding all activities at the station.

The Operations Manager reports to the Assistant Plant Manager and is responsible for the safety and operation of the unit's equipment in accordance with written and approved station procedures. He has the authority to order the shutdown of the reactor, when in his judgment such action is required to protect the safety of the station or the health and safety of the public. The Operations Manager holds, or has held, a Senior Reactor Operator's License at Seabrook Station. He also supervises the Assistant Operations Managers and the Firefighter Supervisor. The Operations Manager is also responsible for the coordination and direction of the Chemistry, Health Physics, and Waste Services departments.

The Assistant Operations Manager - Operations directs the activities of the Shift Managers. He reports to the Operations Manager and assumes the responsibilities of the Operations Manager in the formers absence. He is responsible for the safety and operation of the unit's equipment in accordance with written and approved station procedures. He has the authority to order the shutdown of the reactor, when in his judgment such action is required to protect the safety of the station or the health and safety of the public. The Assistant Operations Manager - Operations holds a Senior Reactor Operator's License.

The Assistant Operations Manager - Support directs the activities of the Operations Department Procedure and Technical Projects groups. He reports to the Operations Manager and assumes the responsibilities of the Operations Manager in his absence. He is responsible for the safety and operation of the unit's equipment in accordance with written and approved station procedures. He has the authority to order the shutdown of the reactor, when in his judgment such action is required to protect the safety of the station or the health and safety of the public. The Assistant Operations Manager - Support holds a Senior Reactor Operator's License.

1. Operating Shift Crew

An operating shift crew normally consists of a Shift Manager and one Unit Supervisor, two Control Room Operators and three Nuclear Systems Operators. The Shift Manager and Unit Supervisor possess Senior Reactor Operator's Licenses; Control Room Operators possess Reactor Operator's Licenses. The minimum shift crew composition for various modes of unit operation is shown in Technical Specification Table 6.2-1.

(a) Shift Manager (SM)

Each Shift Manager reports to the Assistant Operations Manager. The SM is responsible for the safety and operation of the station's equipment in accordance with written and approved station procedures. Each Shift Manager has the authority to order the shutdown of the reactor when in his/her judgment such action is required to protect the safety of the unit or health and safety of the public. The Shift Manager has in addition to a Senior Reactor Operator's License, the training and qualifications of a Shift Technical Advisor or a qualified Shift Technical Advisor will be assigned to his/her shift. The Shift Manager functions as the Shift Technical Advisor and provides requisite technical expertise to the Unit Supervisor in the event of any abnormal operational occurrences.

(b) Unit Supervisor (US)

The Unit Supervisor is responsible for ensuring all unit operations are conducted in accordance with appropriate station orders, procedures and Technical Specifications. The US is responsible for maintaining a record of all shift activities and establishing unit electrical load, as directed by the Shift Manager or as emergency conditions dictate. The US directs the Control Room Operators and the Nuclear Systems Operators in their daily activities. The US has the authority to order the shutdown of the reactor when in his/her judgment such action is required to protect the safety of the unit or the health and safety of the public. Each Unit Supervisor holds a Senior Reactor Operator's License

(c) Control Room Operators (CRO)

The Control Room Operators monitor the unit's status and make adjustments, as needed, to maintain control of the various plant processes. Most CRO duties are confined to the control room although they may perform specific activities in other areas of the station under the direction of the Unit Supervisor. The Control Room Operators each hold a Reactor Operator's License.

(d) Nuclear Systems Operators (NSO)

The Nuclear Systems Operator performs routine inspections and surveillance activities in other areas of the unit. The NSOs maintain various logs and records as required by station procedures. They also perform routine or special radiation surveys commensurate with the duties of their job. During periods when the unit is shut down, NSOs conduct routine tests and clear/return equipment to service as directed by the Unit Supervisor. The Nuclear Systems Operators are unlicensed.

2. Chemistry Department Manager

The Chemistry Department Manager has the direct responsibility for ensuring that the nuclear and steam portions of the station operate within the appropriate water quality specifications which includes water treatment and conditioning for specific station needs. He is responsible for verifying that all liquid, resin, gaseous and hazardous wastes are properly analyzed and processed for station reuse or disposal.

3. Health Physics Department Manager

The Health Physics Department Manager is the Station Radiation Protection Manager and thus has the responsibility and authority to report to the Station Director (as shown on Figure 13.1-4) on any aspect of the Radiation Protection Program or its implementation, as he deems necessary. He normally reports directly to the Operations Manager and is responsible for monitoring station activities for compliance with Health Physics-related regulations and programs.

The Health Physics Department Manager is also responsible for the operation of the Radioactive Waste Processing System and the collection, processing, packaging and loading of radioactive material. This individual provides decontamination services, shielding installation and labor support.

c. Maintenance

The Maintenance Manager is responsible for the coordination and direction of Instrumentation and Control (I&C), Mechanical Maintenance, Electrical Maintenance, and Maintenance Technical Departments. The Maintenance Manager directs support functions that include the corrective action and preventative maintenance programs, maintenance related surveillance activities and station modification and repair activities, including scheduling the performance of the work, controlling the material and the personnel and process involved.

13.1.2.3 Operating Shift Crews

The position titles, applicable operator licensing requirements, and the minimum numbers of personnel planned for each shift are described in detail in Subsection b and Technical Specification Subsection 6.2.2. During normal operations, an operating shift consists of five Nuclear Systems Operators, two Control Room Operators, a Unit Supervisor and a Shift Manager for the station.

During unit refueling operations, when the reactor core configuration is being altered, an individual having a Senior Reactor Operator's license directly supervises the refueling activities in the reactor containment.

Nuclear Systems Operators are trained in applicable station radiation protection procedures to perform routine or special radiation surveys commensurate with the duties of their job. They receive radiation worker training which includes the use of protective barriers and signs, protective clothing and breathing apparatus and limits of personnel exposure. The Shift Manager is responsible for the radiation protection program in the absence of the Health Physics Department Manager or his designated alternate. When fuel is in the reactor, a qualified health physics technician is assigned to the onsite shift to provide additional support to the Shift Manager.

When the unit is in operational modes 1 through 4, a chemistry technician qualified in primary and secondary chemistry analysis is assigned to the onsite shift to provide additional support to the Shift Manager.

13.1.3 Qualification of Nuclear Plant Personnel

13.1.3.1 Qualifications Requirements

The recommendations of Regulatory Guide 1.8, "Qualification and Training of Personnel for Nuclear Power Plants," have been used as the basis for establishing minimum qualifications for all management, supervisory and professional-technical personnel in the station organization. See Section 1.8, "Regulatory Guide 1.8" for specifics.

The education, training and experience requirements for operators, technicians and mechanics equals or exceeds the qualifications for the positions stated in ANS 3.1 and Regulatory Guide 1.8. A retraining and replacement licensed training program for the Station Staff shall be maintained under the direction of the Training Manager in accordance with the Seabrook Station Institute of Nuclear Power Operations (INPO) Accredited Programs. Established company training programs include documented academic and on-the-job training plus comprehensive qualification examinations applicable to the skill level of the position assignment. Where desirable, offsite facilities may be used for specialized training. Records of the scope, general content and level of accomplishment for each person attending offsite training are retained at the station.

The titles of plant management and supervisory personnel who will meet the minimum requirements of ANS 3.1 and Regulatory Guide 1.8 are listed below with their equivalent ANS 3.1 title.

	Station Title	ANS 3.1 Title
a.	Station Director	Plant Manager
b.	Assistant Plant Manager	Plant Manager
c.	Operations Manager	Operations Manager
d.	Assistant Operations Manager -Operations	Operations Manager
e.	Assistant Operations Manager - Support	Operations Manager
f.	Maintenance Manager	Maintenance Manager
g.	Shift Manager	Supervisor with NRC License
h.	Unit Supervisor	Supervisor with NRC License
i.	Chemistry Department Manager	Supervisor without NRC License
j.	Health Physics Department Manager	Supervisor without NRC License
k.	Outage Manager	Supervisor without NRC License
l.	Nuclear Training Manager	Supervisor without NRC License
m.	Senior Project Manager	Supervisor without NRC License
n.	Work Control Manager	Supervisor without NRC License

13.1.3.2 Qualifications of Station Personnel

The key management, supervisory and technical positions in the station organization have been filled by individuals thoroughly trained in their specialty. In addition, most of the individuals have had extensive experience at operating nuclear power plants in their specialty. The nuclear experience of senior personnel at the time of startup was generally in the range of 8 to 20 years. Resumes for personnel holding key positions in the initial plant organization are available upon request. These personnel include the Station Director, Assistant Station Director, Operations Manager, Shift Managers, Instrumentation and Control Department Manager. Many of the key personnel had Senior Operator Licenses or Operator's Licenses at other operating plants or have had extensive nuclear submarine operational responsibilities. Most of the Unit Supervisors and Control Room Operators and at least one individual in each of the major technical disciplines (nuclear engineering, chemistry, health physics, instrumentation and controls) have at least five years of similar experience.

13.2 TRAINING

13.2.1 Licensed Operator Training

a. General Discussion

The licensed operator training programs provide personnel with skills and knowledge, related to the operation of Seabrook Station, necessary to ensure that each individual can safely and effectively perform various assignments. Eligibility of individuals to license or renew a license pursuant to the requirements of 10 CFR 55 is certified by the Station Director.

The overall objectives of the licensed operator training programs are

- to train the staff to operate the unit safely, dependably and economically, and
- to prepare Shift Managers, Unit Supervisors, Control Room Operators, and selected members of the station staff for the NRC licensing examination for Reactor Operator (RO) and Senior Reactor Operator (SRO).

The safe, efficient operation of a nuclear power plant depends on the qualifications and proficiency of its personnel. Several basic categories of training are necessary to provide licensed personnel with a high degree of competence and professionalism, and these categories of training are conducted in the following Seabrook Station programs:

1. Licensed Operator Initial Training Program

   This program provides the training necessary for all personnel who require NRC operating licenses for Seabrook Station, and it meets or exceeds the minimum requirements of 10 CFR 55 and Regulatory Guide 1.8.

2. Shift Technical Advisor Training Program

   This program trains Shift Managers, Unit Supervisors or other designated personnel for the duties and responsibilities of the Shift Technical Advisor on shift. The program meets or exceeds the requirements of 10 CFR 50.120, and Regulatory Guide 1.8.

3. Senior Reactor Operator Training Program

This program provides both operations and skills-based training to ensure senior license candidates can safely operate Seabrook Station as SROs. The program meets or exceeds the minimum requirements of 10 CFR 55 and Regulatory Guide 1.8.

4. Licensed Operator Requalification Training Program

This program provides the training necessary to maintain the proficiency of all Seabrook licensed personnel. The program meets or exceeds the minimum requirements of 10 CFR 55.59.

b. Program Effectiveness and Evaluation

A program for monitoring training effectiveness is established for all areas of license training. Program reviews and evaluations are conducted as directed by the Plant Training Advisory Board (PTAB) and its subcommittees, Training Review Committees (TRCs). Evaluations are used to measure, control, and improve training programs, and they are accomplished by monitoring job performance and reviewing reports from independent parties such as auditors.

Training program deficiencies, identified through evaluation or self-assessment, will be brought to the attention of training management as soon as practical for disposition and/or presentation to the PTAB and TRC along with recommendations for corrective action.

c. Program Accreditation and Instructor Certification

Seabrook Station is committed to the accreditation process implemented by the Institute of Nuclear Power Operations (INPO) and endorsed under the NRC's Final Policy Statement on Training and Qualification of Nuclear Power Plant Personnel, as amended. The company's training programs, including licensed operator training, are accredited by the National Nuclear Accrediting Board under this commitment. This accreditation qualifies Seabrook Station for the membership it maintains in the National Academy for Nuclear Training.

Accreditation of training ensures that Seabrook Station's licensed operator training programs meet or exceed the requirements for a systematic approach to training (SAT) as stated in 10 CFR 55, Section 4. The programs qualify for the special status granted to systems-based training by Sections 31 and 59 of 10 CFR 55.

Seabrook Station's training policy requires instructors who provide instruction in safety systems, integrated response, transients, and simulator courses to be NRC-licensed or certified by the facility as having equivalent knowledge.

Guest lecturers considered to be experts by the nature of their work responsibilities, will be used on a limited basis to supplement training staff instructors. These guest lecturers are exempt from having an NRC operator's license or facility certification.

d. Responsibilities

The following personnel are responsible for various areas of Seabrook Station's operator license training programs.

1. Station Director

The Station Director has overall responsibility for qualification and proficiency for individuals working at Seabrook Station.

2. Nuclear Training Manager

The Nuclear Training Manager provides direction and control for the conduct of training at Seabrook Station and reports to the Vice President of Nuclear Operations Support - Juno Beach. The Training Manager has responsibility for administrative activities, program development and evaluation, and record keeping of accredited training programs. The Training Manager is also responsible for the development and implementation of training conducted in support of the following training programs:

Fire protection

Emergency preparedness

General Employee Training including Plant Access Training

Instructional skills training

13.2.1.1 Licensed Operator Initial Training Program

The licensed operator initial training program provides an individual with the knowledge and skills necessary to safely operate Seabrook Station and to obtain an NRC RO or SRO License.

A program description is used to ensure the licensed operator initial training program meets or exceeds the requirements of 10 CFR 55. The program description applies until it is superseded. Following are general descriptions of the various training segments:

a. Generic Fundamentals

This training consists of reactor physics, thermodynamics, and plant components.

Training methods may include classroom instruction, computer-based training (CBT), in-plant walkthroughs, laboratory exercises, and simulator demonstrations.

b. Detailed Systems

This consists of electrical distribution, as well as primary, secondary, and balance-of-plant systems. The training also covers appropriate theory review, integrated systems response, procedures, and administrative controls.

Training methods may include classroom instruction, CBT, in-plant walkthroughs, and simulator demonstrations. Component malfunctions are covered in simulator training using abnormal procedures.

c. Mitigating the Consequences of Core Damage and Transient and Accident Analysis

This training is devoted to mitigating the consequences of core damage and transient and accident analysis. The training may consist of classroom instruction, CBT, sessions on the simulator, and supervised study with problem solving.

d. Simulator Training

Simulator training stresses diagnostics and teamwork throughout to give each license candidate practice in applying the knowledge and skills needed to perform control room tasks during operating conditions. Topics include the use of normal, abnormal, and emergency response procedures, reactor start-ups, equipment locations, integrated plant operations and emergency preparedness.

e. On-Shift Participation

On-shift participation is at the level of the license being sought, and it is designed to give each license candidate an opportunity to observe plant operations and complete work assignments in the control room alongside licensed operators. On-the-job training (OJT) lasts a minimum of thirteen weeks, not necessarily sequential, for license candidates who must perform, observe, or discuss activities and tasks as specified in the Qualification Guide. Per 10 CFR 55.45, initial license candidates are required to perform a minimum of five significant control manipulations in the plant or on the simulator. Candidates are permitted to manipulate controls that affect the reactor's power level and/or reactivity under the supervision of a licensed operator.

13.2.1.2 Shift Technical Advisor Training Program

The Shift Technical Advisor (STA) training program meets or exceeds the requirements of 10 CFR 50.120 and Regulatory Guide 1.8. The specific requirements to be an STA include having an SRO license and a Bachelor of Science degree in engineering, engineering technology, or physical science from an accredited college or university. STA training emphasizes emergency tasks, emergency response procedures, and transient and accident analysis. This training provides Seabrook Station with on-shift engineering expertise and operations abilities necessary to ensure that control room shift activities support safe and efficient operation during normal and emergency plant conditions.

13.2.1.3 Shift Manager Training Program

Shift manager training is conducted under a program designed to provide a broad perspective of plant operations and a high degree of proficiency when interacting with people to implement plant policies and procedures. The program recognizes the skills and knowledge required to act as the senior manager on shift with responsibility for safe and reliable operation of plant equipment, and for protecting the health and safety of the general public and plant personnel.

Development of the shift manager training program was based on analyses of training needs for shift managers using the systematic approach to training (SAT) methodology. The analyses included consideration of a generic job and task analysis performed by the INPO and an industry panel. The program encompasses all of the terminal and enabling learning objectives derived from those analyses, and it meets or exceeds the requirements of 10 CFR 50.120.

13.2.1.4 Senior Reactor Operator Training Program

The senior reactor operator training program provides an individual with the knowledge and skills necessary to safely operate Seabrook Station and to obtain an NRC SRO license.

A program description is used to ensure the senior reactor operator training program meets or exceeds the requirements of 10 CFR 55. The program description applies until it is superseded. A brief description of the various training segments of this program is found in Subsection 13.2.1.1 of this document. Following is a list of those training segments:

a. Mitigating the Consequences of Core Damage and Transient and Accident Analysis

b. Simulator Training

c. On-Shift Participation

13.2.1.5 Licensed Operator Requalification Training Program

The licensed operator requalification training program provides instruction for all licensed operators so as to maintain proficiency and a high level of knowledge for their jobs. A program description is used to ensure the licensed operator requalification training program complies, within the framework of a systems approach to training, with 10 CFR 55, "Operators' Licenses." The program description applies until it is superseded. Following is a brief description of the interrelated elements which make up this program:

a. Lecture Series

1. Design Change, Procedure Revision, and Industry Experience Review

This portion of the program will ensure that appropriate changes and revisions to plant design, changes to procedures and Technical Specifications, and industry experiences are reviewed by each licensee. Design changes, procedure revisions and industry experience reviews are incorporated into lessons via Training Development Recommendations (TDRs) when appropriate.

All licensees review the applicable operating experience of Seabrook Station as well as selected operational information from the nuclear industry. The following reports and publications are among those that will be considered in obtaining information for analysis and review:

- Licensee Event Reports (LERs)
- Condition Reports (CRs)
- Audit, Evaluation, and Inspection Reports
- NRC IE Information Notices and Bulletins
- Publications and periodicals covering nuclear industry information
- INPO Significant Event Reports (SERs) and Significant Operating Experience Reports (SOERs).

2. Retraining Lectures for License Holders

A formal classroom lecture series is conducted as part of the requalification program. The level of instruction will be consistent with the level of license held. This lecture series covers two general areas:

- Fundamentals and Systems Review
- Procedures and Administrative Controls

Fundamentals and Systems Review lectures present instruction based on information from standard reference sources relating to topics such as reactor theory, plant design, and radiation control. Procedures and Administrative Controls lectures cover topics involving essential plant operational guidelines such as Technical Specifications and administrative and operating procedures.

b. On-the-Job Training

On-the-job training is designed to ensure that all licensed personnel operate reactor controls and participate in major evolutions. On-the-job training is conducted throughout the term of the operator's license, and all required on-the-job training is completed prior to license renewal.

Seabrook Station's certified simulation facility is used to ensure that required control manipulations not performed in the plant are performed on the simulator during the term of the operator's license.

The simulator is used in requalification training to emphasize such areas as infrequently performed procedures, required responses to abnormal and emergency procedures, and significant operating events.

c. Requalification Examinations

An examination or quiz is administered in accordance with the training program description. These quizzes examine a combination of classroom and simulator objectives presented to date, and they will parallel, in content and degree of difficulty, segments of an annual requalification examination. Examinations and quizzes will be retained as a part of the training record.

A comprehensive written examination will be administered to all licensees at least every two years. These examinations incorporate many of the requirements of NUREG-1021, Operator Licensing Examination Standards for Power Reactors.

Each application for renewal of an RO or SRO license will be accompanied by a statement, signed by the Station Director, certifying that the applicant has satisfactorily completed the requalification program during the effective term of his or her current license, and that he or she has discharged license responsibilities competently and safely.

13.2.1.6 Requalification Training Program Records

Requalification training program records will be maintained for a minimum of six years from the date of the recorded event to document the participation of each licensed RO and SRO in the program. The records will include copies of written examinations administered, answers provided by the licensees, and results of evaluations.

13.2.1.7 Activation of Inactive License Program

An inactive license is defined as a license held by an individual who has participated fully in the Seabrook Station licensed operator requalification program, but has not actively performed the functions of a licensed RO or SRO for a minimum of seven, eight-hour shifts or five, twelve-hours shifts per calendar quarter.

For an individual with an inactive license to resume the functions authorized by the license, the conditions specified by Section f of 10 CFR 55.53 must be met.

13.2.1.8 Applicable Documents

The training programs listed under Items 1 through 4 in Subsection 13.2.1.a will be conducted in accordance with applicable requirements in the NRC section of Title 10 of the CFR, and they will meet the intent of applicable recommendations provided by Regulatory Guides and other publications. The recommendations and regulatory requirements are included in the program descriptions where applicable.

13.2.2 Training for Nonlicensed Personnel

a. General Discussion

The comprehensive training programs conducted for nonlicensed personnel comply with the provisions and intent of Regulatory Guides and other publications identified in the individual program descriptions. Subsections 13.2.2.1 through 13.2.2.11 have brief descriptions of the training each nonlicensed group receives. The programs meet or exceed the requirements of 10 CFR 50.120.

The overall objective of the nonlicensed training programs is to train a staff to operate and maintain the unit safely, dependably, and economically. The nonlicensed training programs provide instruction to personnel in various disciplines who participate in the maintenance and operation of Seabrook Station. The degree to which an employee is trained is consistent with his or her experience, the task lists for his or her job, and regulatory requirements.

A program for monitoring training effectiveness is established for all areas of nonlicensed training. That program is described in Subsection 13.2.1.b of this document.

Seabrook Station applies the same systematic approach to training for nonlicensed personnel that it applies to licensed operator training. The company's nonlicensed training programs that come under INPO's accreditation program are accredited by the National Nuclear Accrediting Board.

Qualification guides specify prerequisite training and requisite job performance criteria for various job descriptions. SAT is used to identify needs, develop and deliver training, solicit plant feedback, and modify training as indicated by the feedback. Training settings include classroom, self study, CBT, simulator, laboratory, and on-the-job training (OJT).

OJT practices are defined in the Training and Qualification Manual (NAQM). Individuals qualified to perform specific tasks and trained to conduct OJT for the tasks are selected by the department manager to serve as OJT instructors and task performance evaluators. Employees may receive credit for designated segments of training under a formal process for the validation of equivalent previous training.

b. Responsibilities

The responsibilities for implementation of nonlicensed training programs are described in Subsection 13.2.1.d. of this document.

13.2.2.1 Instrumentation and Control Technicians

Designated technicians are trained on selected plant protection and control systems including Solid-State Protection, 7300 Process, Nuclear Instrumentation, Rod Control and Rod Position Indication. Selected technicians are also trained on additional plant systems including Radiation Monitoring, Main Turbine Electrohydraulic Control, and selected plant fluid and electrical systems.

13.2.2.2 Mechanics

Mechanics, including radwaste technicians, receive training in hand tools, basic mechanical maintenance, and mechanical maintenance of site equipment. Training in such areas as bolting, snubbers, welding, nondestructive examination, crane operation, advanced vibration, and hydraulic wrenches is available for those who perform work requiring such training.

13.2.2.3 Electricians

Electricians receive training in basic electrical maintenance and applied electrical maintenance of site equipment.

13.2.2.4 Radwaste Technicians

Radwaste technicians receive training using classroom and OJT formats, and that training includes lessons in decontamination, radwaste processing, handling, shipping, and disposal as well as annual instruction on industry events.

13.2.2.5 Health Physics Personnel

Health Physics personnel receive training on plant systems, as well as on health physics practices, procedures, and equipment.

13.2.2.6 Chemistry Technicians

Chemistry technicians receive instruction in four fundamental areas: basic chemistry, instrumental/analytical chemistry, plant systems chemistry and chemical control, and radiochemistry and radiochemical analyses.

13.2.2.7 Emergency Preparedness Training

All personnel assigned to the emergency response team receive emergency preparedness training to perform the functions of their position as specified in Section 12.2 of the Seabrook Station Radiological Emergency Plan.

13.2.2.8 Engineering Support Personnel (ESP)

The ESP training program uses a systematic approach to training to provide broad-based training for Seabrook Station personnel who participate in engineering support activities. ESP training supplements entry-level knowledge and skills and provides Seabrook-specific information. This enhances their ability to perform assigned duties in a manner that promotes safe and reliable plant operation. Some specialized topics in the ESP program are taught by technical subject matter experts from engineering support groups.

13.2.2.9 Fire Protection Personnel

The fire protection training program for Seabrook Station follows the guidance provided in Appendix R of 10 CFR 50 and the NRC document titled, "Nuclear Plant Fire Protection Functional Responsibilities, Administrative Controls, and Quality Assurance." Following is a brief description of the training program:

a. Fire Brigade

All fire brigade members attend regularly scheduled practice sessions on the proper method of fighting various types of fires. These sessions must be conducted at least annually (every 12 months ± 3 months) to provide brigade members with hands-on experience in extinguishing actual fires using equipment available at Seabrook Station.

Brigade members will practice as a team in periodic drills. Drills for each fire brigade will occur at regular intervals not to exceed ninety-two days, with

1. a maximum allowable extension not to exceed 25% of the ninety-two day time interval, but

2. the combined time interval for any three consecutive drill intervals shall not exceed 3.25 times the specified ninety-two day time interval.

b. Other Station Employees

All full-time employees, temporary employees and construction personnel receive instruction on fire protection safety, evacuation routes, and the procedures for reporting a fire as part of Plant Access Training (PAT).

Security personnel receive instruction on procedures for entry of offsite fire departments, crowd control, and procedures for reporting potential fire hazards observed when touring the facility.

13.2.2.10 Management and Supervisory Training

Seabrook Station conducts programs that provide position-specific training on the knowledge and skills required for effective management and supervision. These programs are described below.

a. Management and Supervisory Personnel Training Program

The management and supervisory training program provides instruction to meet the different needs of each management and supervisory level at Seabrook Station. Participants in the program include both licensed and nonlicensed members of management. Major features of the management and supervisory training program are listed below:

- Instruction within the program covers the knowledge and skills needed for effective management or supervision for directors, managers, supervisors, and first line supervisors.
- The program provides training on the special needs of new supervisors during the first few months of their work.

Management and supervisory training includes problem analysis, decision analysis, potential problem analysis, written and oral communications, behavior observation, safety, team-building, management techniques, and business fundamentals. Detailed information about the program is provided in the program description.

Personnel assigned to the shift manager training program mentioned in Subsection 13.2.1.3 also receive this training.

b. Maintenance Supervisory Personnel Training Program

The maintenance supervisory personnel training program provides initial and continuing training for supervisory personnel. These personnel receive the knowledge and skills needed to independently perform supervisory duties in a manner that promotes safe and reliable plant maintenance and operation. This program supplements training received in the management and supervisory personnel training program.

The program applies to supervisory personnel in I&C, mechanical and electrical maintenance, as well as contractor supervisory personnel under the supervision of the Maintenance Department.

13.2.2.11 Plant Access Training (PAT)

Plant Access Training (PAT) is provided to all personnel requiring unescorted access to the protected area. This training assumes a new employee has no familiarity with nuclear power plants, and the training is followed by an exam. Instruction covers site familiarization, fitness for duty, escort procedures, security, radiation protection, industrial safety including fire safety, the radiological emergency plan, and quality assurance. All who require unescorted access to a Radiologically Controlled Area (RCA) must complete training in radiation protection, including a practical factors check-out.

13.2.3 Retraining

Nonlicensed personnel receive retraining and training updates in the following subjects:

Procedures (as appropriate)

Radiation Protection

Security

Radiological Emergency Plan

Fire Safety

Safe Work Practices

Skills Refresher

Industry and Plant Experience

Refresher training is scheduled on a periodic basis depending on the volume of the material to be taught.

13.2.4 Position Job Analyses

A position job analysis determined training needs from the INPO generic task lists and from information provided by station departments. These two sources were used to develop site-specific task lists which are revised periodically to reflect changes in job activities.

13.2.5 Program Evaluation

Testing accompanies most knowledge- and skills-based training in the form of performance and written exams. Training procedures/instructions provide for the regular evaluation of programs to ensure training effectiveness.

13.3 EMERGENCY PLANNING

A comprehensive Radiological Emergency Plan for Seabrook Station is provided as a separate volume to this application. This plan is maintained and controlled as a separate document, and is updated in accordance with the requirements of 10 CFR 50.54(q).

The Seabrook Station Radiological Emergency Plan was developed in accordance with the requirements of Paragraph 50.34(b), 50.47(b) and Appendix E to Title 10 of the Code of Federal Regulations Part 50, "Licensing of Production and Utilization Facilities."

The radiological analysis information required by Regulatory Guide 1.70 (Rev. 3), which is not part of the Seabrook Station Radiological Emergency Plan, is contained in Appendix 13A.

13.4 REVIEW AND AUDIT

Operating phase activities that affect nuclear safety are reviewed and audited through a comprehensive program. The review and audit program assures proper review and evaluation of proposed changes, tests, experiments and unplanned events. ASME NQA-1, 1994 forms the basis for the program.

13.4.1 Onsite Review

13.4.1.1 SORC

A Station Operation Review Committee (SORC) performs the onsite operational review responsibilities. The purpose of the SORC is to advise the station management on all matters related to nuclear safety. The function, composition, meeting frequency, responsibilities and authority of the SORC are contained in Appendix A of the FPL Quality Assurance Topical Report (QATR).

13.4.1.2 Operations Phase Reviews

The scope of SORC operational phase review is specified in Appendix A of the FPL QATR.

13.4.2 Audit Program

Audits are normally performed under the quality assurance audit program described in the FPL Quality Assurance Topical Report.

13.5 PLANT PROCEDURES

All station procedures and any changes to them are reviewed and approved by appropriate station supervisory and management personnel in accordance with the FPL Quality Assurance Topical Report.

In the event of an emergency condition, which could likely affect the health and safety of the public, if not promptly corrected, the Station Director or his designated alternates may authorize emergency repairs and activities that deviate from written procedures. When such emergency is undertaken, the nature of the emergency, its cause, the emergency corrective action and justification therefore shall be documented and submitted for review and approval as required for temporary procedures.

13.6 INDUSTRIAL SECURITY

A description of the physical security program for Seabrook Nuclear Generating Station Units 1 has been provided to the NRC as a separate part of the application withheld from public disclosure pursuant to paragraph 2.790 (d), 10 CFR Part 2, Rules of Practice.

TABLE 13.5-1 DELETED

TABLE 13.5-2 CONTROL ROOM OPERATING PROCEDURES

Listed below are the categories of Operating Procedures which are used by licensed operators in the control room to perform various activities and plant evolutions. These categories are listed in accordance with Updated FSAR Subsections 13.5.2.3a.1 through 13.5.2.3a.4. The descriptions are given to indicate the scope of procedures which cover the significant operations listed by Regulatory Guide 1.33, Appendix A, where appropriate.

1. General Plant Operating Procedures

   a. Major Plant Evolutions

      COLD SHUTDOWN to HOT STANDBY; HOT STANDBY to minimum load; approach to criticality; power increase and decrease; minimum load to hot standby; hot standby to cold shutdown; post trip review.

   b. Turbine Operations

      Turning gear, starting, phasing, shutdown; electro-hydraulic and standby control operations.

   c. Refueling Operations

      Refueling cavity fill, purification, and drain; operations of refueling machine, Fuel Transfer System, upender, fuel pit bridge, RCCA change machine, and various handling tools; containment integrity and closeout.

2. Procedures for Startup, Operations, and Shutdown of Safety-Related Systems

   Instructions for energizing, filling, venting, draining, startup, shutdown, and changing modes of operation have been prepared, as appropriate, for the following systems:

   a. Reactor Coolant System

      RCS evacuation, fill, vent, and drain tank operation; RCP operation; pressurizer bubble formation; reactor makeup water fill, vent, and operation; pressurizer relief tank operation.

   b. Control Rod Drive System

      Rod control - Automatic and manual; MG set operation.

   c. Shutdown Cooling System (RHR)

      System startup, operation, and shutdown.

   d. Emergency Core Cooling System

      SI operation; inadvertent containment isolation; spray additive tank and containment spray operations.

e. Component Cooling Water System

PCCW, SCCW, and thermal barrier fill and vent; PCCW, SCCW, and thermal barrier startup, operation, and shutdown; PCCW makeup and chemical addition.

f. Containment

Containment enclosure ventilation; containment air purge; containment online purge.

g. Atmosphere Cleanup System

Containment ventilation system operation

h. Fuel Storage Pool Purification and Cooling System

Spent fuel pool cooling and purification system fill, vent, and operation.

i. Main Steam System

Main steam, MSR, and auxiliary steam reducing station operations; extraction steam and turbine seal steam operations.

j. Pressurizer Pressure and Spray Control System

Heater and spray operations contained in CVCS procedures.

k. Feedwater System

Feedwater fill and vent; main feed and startup feed pumps startup, operation, and shutdown.

l. Auxiliary (Emergency) Feedwater System

Aligning and restoring EFW for auto-initiation.

m. Service Water System

System fill, vent, and operations; cooling tower operation including heating and deicing.

n. Chemical and Volume Control System

Fill, vent, and operation of charging, letdown, and seal injection; operation of excess letdown, letdown degasifier, demineralizers, filters, Pressurizer Level Control System, makeup, and boric acid subsystems; establishing cover gases.

o. Auxiliary Building (and Other Safety-related) Heating and Ventilation

Heating and ventilation for the following areas: Service Water Pumphouse and Cooling Tower, Primary Auxiliary Building, Diesel Generator Building, Fuel Storage Building, Emergency Feedwater Pumphouse.

p. Control Building Heating and Ventilation

Heating, cooling (where applicable), and ventilation for the following areas: control room, cable spreading area, emergency switchgear area, and electrical.

q. Radwaste Building Heating and Ventilation

Heating and ventilation for the Waste Processing Building

r. Instrument Air System

Operations of the Compressed Air and Containment Compressed Air Systems.

s. Electrical Systems

(1) Offsite (access circuits)

Operation of main generator, unit auxiliary, and reserve auxiliary transformer auxiliaries.

(2) Onsite

(a) Emergency Power

Operations of battery chargers, diesel generators and auxiliaries.

(b) AC Systems

Operations of 13.8 kV, 4.16 kV, 480V, and 120V; operation of lighting systems.

(c) DC Systems

Operations of 125V DC systems and inverters; operation of emergency lighting.

t. Nuclear Instrument System

NIS switch alignment; NIS visual/audio count rate system operations.

u. Reactor Control and Protection System

See Reactor Coolant System and Control Rod Drive System.

v. Hydrogen Recombiner

Operations of hydrogen analyzer and hydrogen recombiner.

3. Procedures for Abnormal Conditions

Loss of refueling cavity water, letdown, charging, RHR during shutdown, vacuum, instrument and containment air, control room makeup air, and plant computer; malfunctions of reactor coolant pump, control rod drives, rod position indication, PCCW, Service Water Cooling Tower, turbine generator; RC leakage, condenser leakage, fire system break, oil spill; response to fire, rapid boration, RC high activity and chemistry out of specification, steam generator blowdown; safe shutdown, severe weather conditions.

4. Emergency Operating Procedures

   a. Emergency Response Procedures

      Reactor trip, safety injection, and rediagnosis; natural circulation cooldown scenarios; loss of primary or secondary coolant scenarios and recoveries; steam generator tube rupture scenarios and recoveries.

   b. Emergency Contingency Actions

      Loss of AC power and recovery scenarios; loss of coolant outside containment and loss of emergency coolant recirculation; steam generator depressurization and tube rupture.

   c. Functional Restoration Procedures

      Responses to nuclear power generation/ATWS, and loss of core shutdown; responses to inadequate, degraded, and saturated core cooling; responses to loss of secondary heat sink, steam generator over pressure, steam generator high and low level, loss of normal steam release capabilities; response to imminent or anticipated pressurized thermal shock; responses to high containment pressure, containment flooding, or containment high radiation; responses to high or low pressurizer level and voids in reactor vessel.

   d. Critical Safety Functions (Status Trees)

      Subcriticality, core cooling, heat sink, integrity, containment, inventory.

Figure 13.1-1
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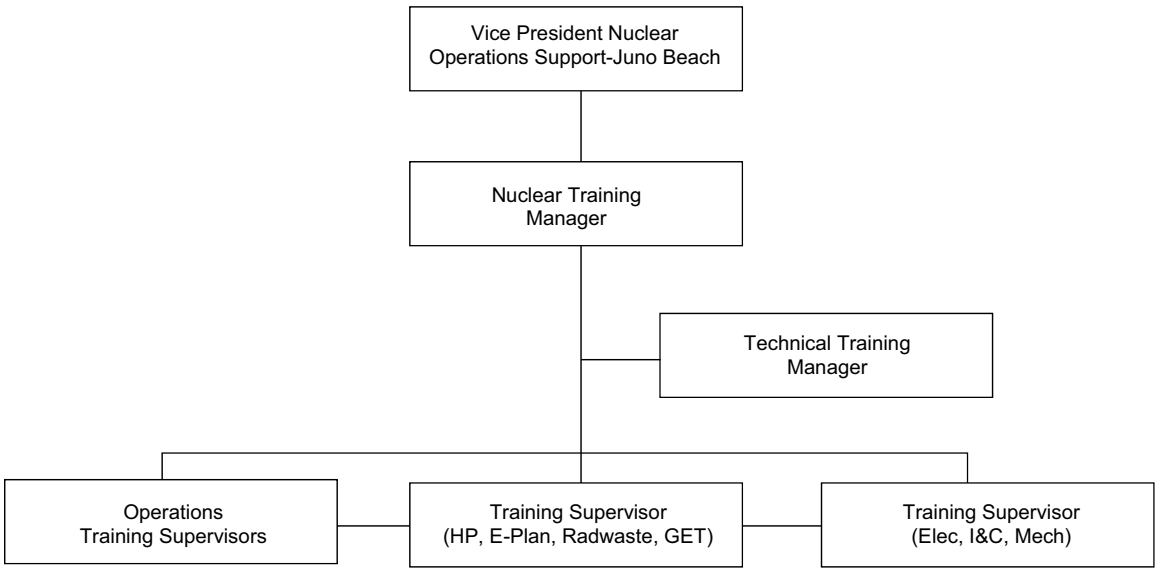

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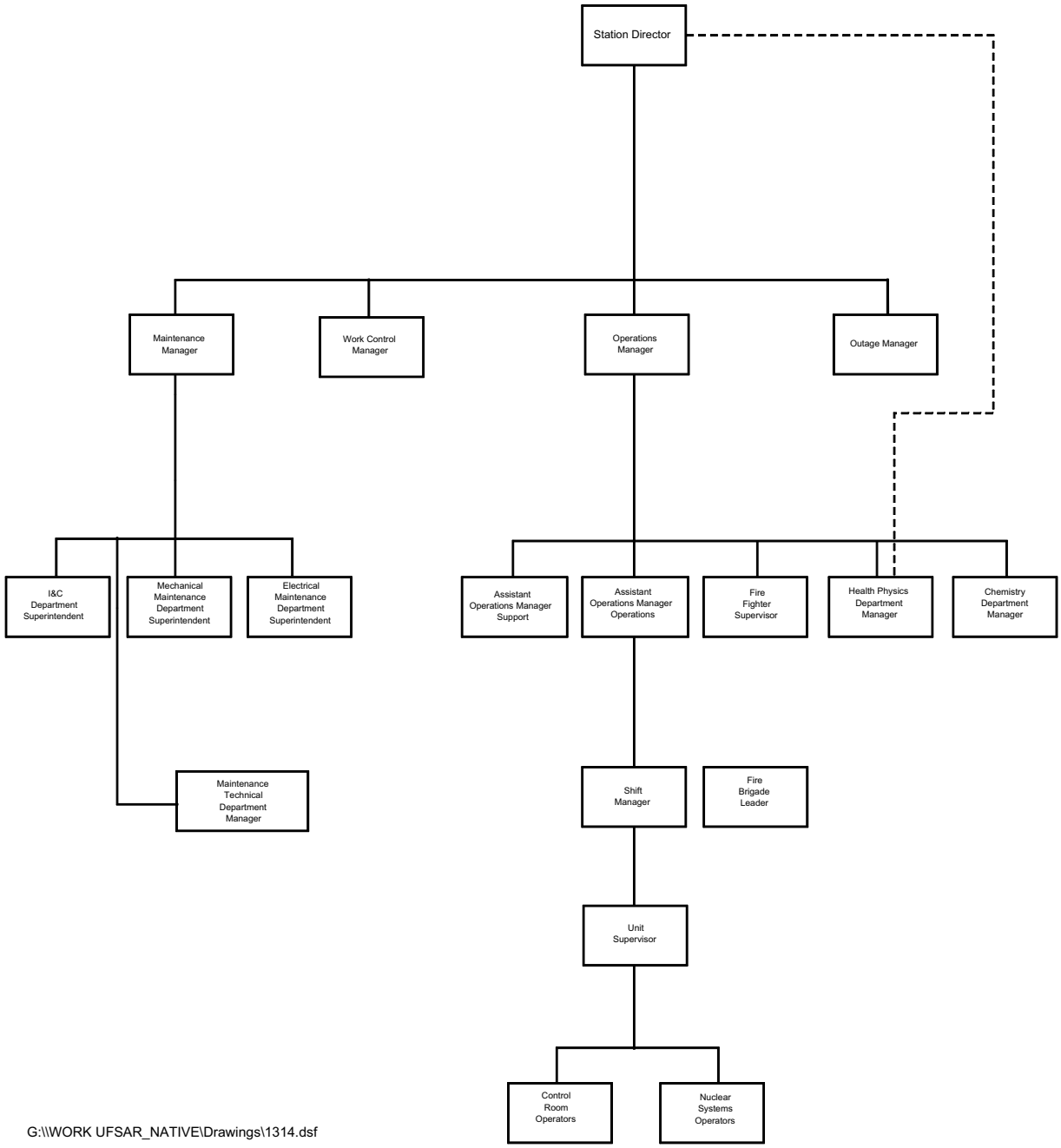
SEABROOK STATION UPDATED FINAL SAFETY ANALYSIS REPORT	Seabrook Station Training Organization	
		Figure 13-1-3



SEABROOK STATION UPDATED FINAL SAFETY ANALYSIS REPORT	Seabrook Station Organization	
		Figure 13.1-4

See 1-NHY-500090

SEABROOK STATION UPDATED FINAL SAFETY ANALYSIS REPORT	Control Building - Control Room Arrangement - Plan at Elevation 75'-0	
		Figure 13.5-1

APPENDIX 13A RADIOLOGICAL ANALYSIS

An analysis has been performed to provide curves for thyroid doses of 5, 25, 150 and 300 rem and whole body (β + γ) doses of 1, 5 and 25 rem. Each curve represents a conservative estimate of the elapsed time to reach the specified dose level as a function of distance from the release point under the conditions postulated for the release of radioactivity for the design bases loss-of-coolant accident (Subsection 15.6.5.4). These curves do not represent dose as a function of time and distance (x) for any one discrete circumstance, but rather the locus or envelope of highest values of dose that would be expected under all wind speed conditions. The doses have been maximized by imposing the concept of an optimal or worst wind speed ($\mu = \frac{2x}{T}$)such that the radioactive plume front transit time ($\frac{X}{\mu}$) is equal to the actual exposure time ($T - \frac{X}{\mu}$), the sum of the two being the total elapsed time from the onset of release (T). Such an assumption can, however, result in plume velocities that are unrealistically low particularly for short distances. In order to be consistent with Chapter 15, plume velocities (wind speeds) have been bounded to a lower limit of 1.78 meters sec^{-1}. This lower limit for wind speed has been determined from the calculated EAB LOCA thyroid dose and 1 hour χ/Q value used in the Chapter 15 design bases accident analysis (i.e., a wind speed of 1.78 m/s in conjunction with Pasquill stability Class F assumptions, results in the 2-hour thyroid dose as calculated in Chapter 15, Subsection 15.6.5.4).

Doses have been calculated using the dose conversion factors from Regulatory Guide 1.109, "Calculation of Annual Doses to Man From Routine Releases of Reactor Effluents For the Purpose of Evaluating Compliance With 10 CFR Part 50, Appendix I." The following equation has been used to calculate offsite thyroid and whole body (β + γ) doses:

$$D = \frac{F(x)}{\mu}\left[T - \frac{X}{\mu}\right]\frac{D_\circ}{T_\circ\left(\chi/Q\right)_{x_\circ}}$$

Where $\mu = \frac{2x}{T}$, μ min. = 1.78 (meters sec^{-1})

x = Distance from release point to receptor (meters)

T = Total elapsed time from onset of release (sec)

$F(x)$ = $1/\pi\sigma_y \sigma_z$, Pasquill stability Class F for distance x

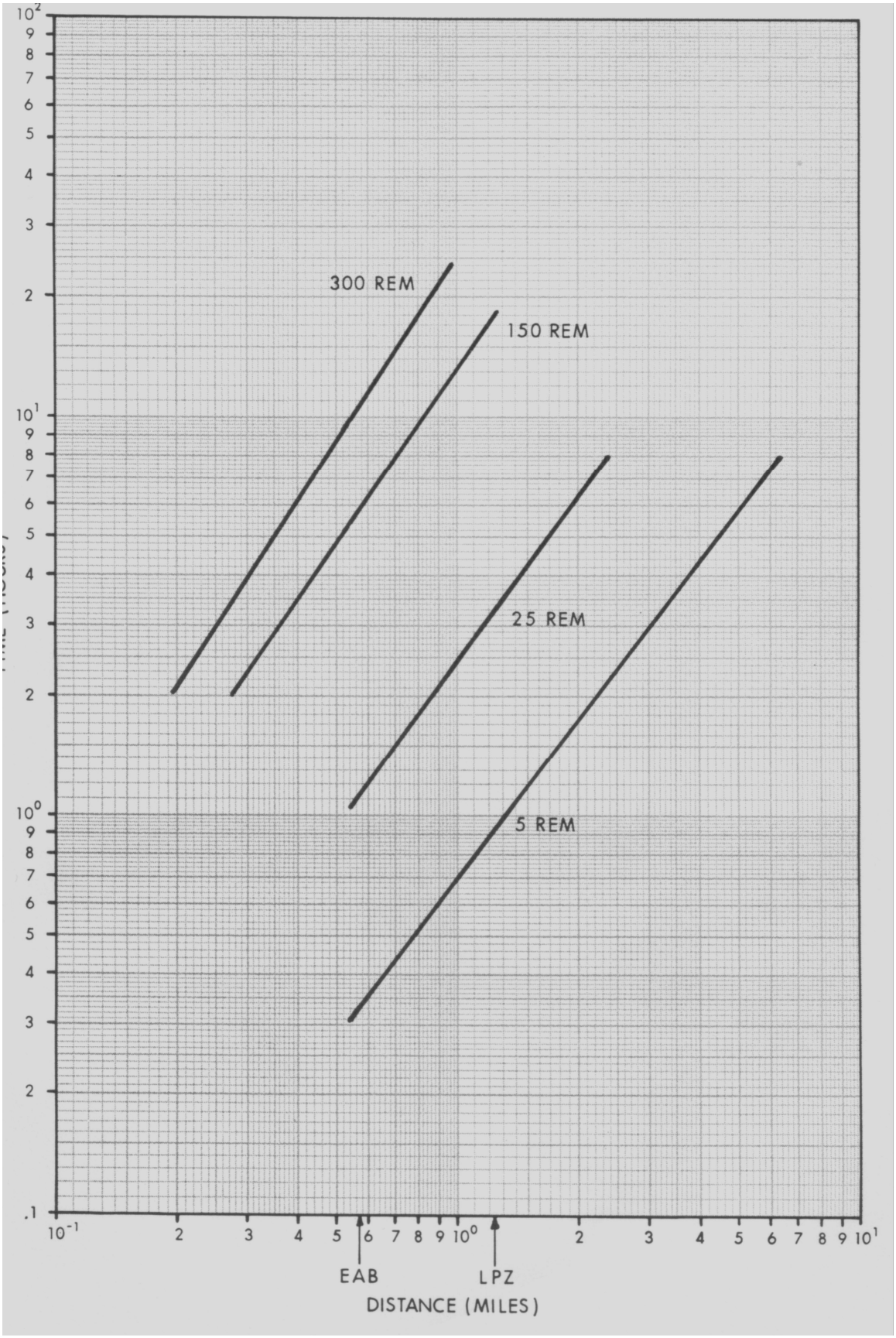
D_o = EAB calculated two-hour doses for LOCA releases (52 rem thyroid and 3.8 rem whole body)

T_o = 2 hours (7200 sec)

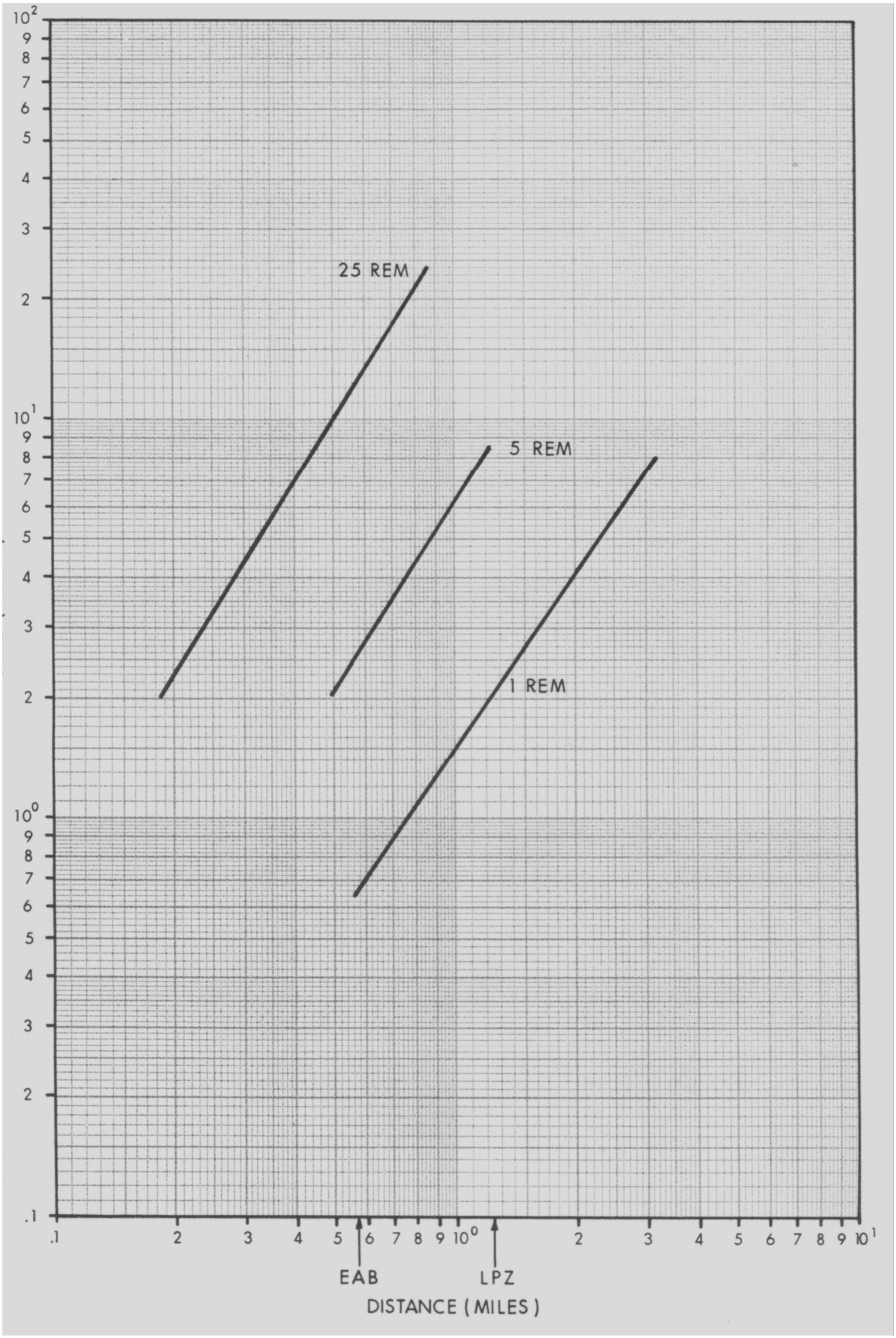
$(\chi / Q)_{x_o}$ = 2.67×10^{-4} sec/m^3, EAB conservative case one hour dispersion coefficient

D = Dose (rem) at distance x, for time period T

Plots showing projected ground-level doses for stationary individuals as a function of time and distance are presented in Figure 13A-1 and Figure 13A-2.



SEABROOK STATION UPDATED FINAL SAFETY ANALYSIS REPORT	Thyroid Dose Time vs. Distance LOCA Releases	
		Figure 13-A-1



SEABROOK STATION UPDATED FINAL SAFETY ANALYSIS REPORT	Whole Body Dose vs. Distance LOCA Releases	
		Figure 13-A-2