

Present -
01-5-04-1

Volume 01

Section 04

Revision 4

Date: 9/13/83

PLANT ADMINISTRATIVE PROCEDURELICENSED OPERATOR TRAINING AND QUALIFICATION PROGRAMSAFETY RELATED

Prepared: AD Hoffman
 Reviewed: JE Cross Asst. Plant Manager C.H. Hutchinson Nuc. Suppt. Man. C.A. Burt Plt. Qual. Supt.
 PSRC JE Cross
 Approved: CKM Plant Manager

List of Effective Pages:

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Attachments

RevisionTCN No.

0	None
1	None
2	None
3	None
4	None

SAFETY EVALUATION APPLICABILITY REVIEW

	Yes	No
(1) Change to Facility as Desc. in FSAR	—	✓
(2) Change to Procedure as Desc. in FSAR	—	✓
(3) Test or Experiment not Desc. in FSAR	—	✓
(4) Change to Tech. Specs.	—	✓
(If Yes, perform 10CFR50.59 Safety Eval.)	—	✓

ENVIRONMENTAL EVALUATION APPLICABILITY REVIEW

(1) Change to Environmental Protection Plan	—	✓
(2) Will or may effect environment	—	✓
(If Yes, perform Environmental Eval.)	—	✓

Signature AD Hoffman Date 9/14/83

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1.0 PURPOSE

- 1.1 The objective of the Licensed Operator Training and Qualification Program is to define and implement a training program which will:
 - 1.1.1 Improve nuclear plant operational safety and reliability.
 - 1.1.2 Assure that individuals demonstrate an acceptable level of competence prior to assuming licensed operating responsibilities.
 - 1.1.3 List the requirements to be satisfied prior to an individual being administered an NRC Operator License Examination or Senior Operator License Examination.
 - 1.1.4 Establish training courses which satisfy the prerequisites for NRC Operator and Senior Operator Examinations.
 - 1.1.5 Establish methods for documenting the completion of the prerequisites for NRC Operator and Senior Operator Examinations.

2.0 RESPONSIBILITIES

- 2.1 Plant Manager - Is responsible for providing evidence to the Vice President - Nuclear Production that each individual operator is able to perform his responsibilities in a safe and competent manner. He is responsible for advising the Nuclear Support Manager concerning the content and conduct of the Licensed Operator Training Program.
- 2.2 Operations Superintendent - Is responsible to the Plant Manager for establishing the qualification requirements to ensure that the licensed operators obtain the training and operational experience necessary to perform their responsibilities.
- 2.3 Training Superintendent - Is responsible to the Nuclear Support Manager for providing and implementing a Licensed Operator Training Program which meets the requirements of the references. This effort shall be coordinated with the Operations Superintendent.
- 2.4 Nuclear Support Manager - Is responsible for the overall administrative control/conduct of the Licensed Operator Training Program. This effort shall be coordinated with the Plant Manager.

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- 2.5 Vice President, Nuclear Production - Is responsible for certification of the competency of each license applicant to operate the plant safely and competently prior to proposing the candidate for licensing for NRC.

3.0 REFERENCES

- 3.1 Operational Quality Assurance Manual MPL-TOP-1A
- 3.2 10 CFR 55, Operator's Licenses
- 3.3 USNRC Regulatory Guide 1.8-1975/ANSI N18.1-1971, Standards for Selection and Training of Personnel for Nuclear Power Plants
- 3.4 Plant Administrative Procedure 01-S-04-2, Licensed Operator Requalification Training
- 3.5 Final Safety Analysis Report, Section 13.2, Training Program
- 3.6 ANS 3.4/ANSI N546, American National Standard Medical Certification and Monitoring of Personnel Requiring Operator Licenses for Nuclear Plants
- 3.7 Plant Administrative Procedure 01-S-04-14, Training Records
- 3.8 Plant Administrative Procedure 01-S-04-15, Required Reading Program
- 3.9 Plant Administrative Procedure 01-S-12-2, Screening of Plant Staff Applicants
- 3.10 USNRC NUREG 0737, Clarification of IMI Action Plan Requirements, Section I.A.2.1
- 3.11 FSAR 13.1.3, Qualification of Nuclear Plant Personnel

4.0 ATTACHMENTS

None

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5.0 DEFINITIONS

- 5.1 Nuclear Power Plant Experience - Experience acquired in the preoperational and startup testing activities or operation of nuclear power plants. Experience in design, construction, maintenance, instruction, or experience acquired at military, research or production nuclear plants may qualify as equivalent nuclear power plant experience and should be evaluated on a case-by-case basis in accordance with References 3.3 and 3.10.
- 5.2 Power Plant Experience - Experience acquired in the testing or operation of power generating facilities. Experience in design, construction, maintenance, or related academic/technical training may be considered applicable power plant experience and should be evaluated on a case-by-case basis in accordance with References 3.3 and 3.10.
- 5.3 On-The-Job Training - Participation in nuclear plant startup, operation, maintenance, or technical services under the direction of experienced personnel.
- 5.4 Qualification - Knowledge, characteristics or abilities gained through training or experience or both that demonstrates that an individual can perform a required function.
- 5.5 Qualification Card - A listing of knowledge and performance requirements which need to be accomplished to substantiate that an individual can perform a required function.
- 5.6 Walkthrough - The process of performing the motion of a procedure without actually operating equipment. Also, the process of demonstrating knowledge of a system through discussion during a tour of the area which contains that system of facility.
- 5.7 Control Room Operator - An individual who possesses an operator's license pursuant to 10 CFR 55, Operator's Licenses.
- 5.8 Senior Reactor Operator - An individual who possesses a senior operator's license pursuant to 10 CFR 55, Operator's Licenses.

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5.9 Related Technical Training - Formal training beyond the high school level in technical subjects associated with the position in question, such as acquired in training schools or programs conducted by the military, industry, utilities, universities, vocational schools, or others. Such training programs shall be of a scheduled and planned length and include text material and lectures.

5.10 Academic Training - Successfully completed college-level work leading to a recognized degree in a discipline related to the position in question.

6.0 DETAILS

6.1 General

6.1.1 The Licensed Operator Training Program consists of two separate subcategories:

- a. Licensed Operator Training
- b. Senior Licensed Operator Training

Licensed operator training is designed to ensure that the individuals who operate the controls of a nuclear reactor are competent to do so. This competence entails an understanding of the underlying principles in the various engineering disciplines which relate to their responsibilities, a knowledge of the systems and components over which they have responsibility and control, a knowledge of the procedure established for controlling the plant, and skill in manipulating plant controls.

Senior licensed operator training is designed to ensure that the individual who directs the activities of the licensed operators possesses an understanding of principles, knowledge of systems and components, and analytical ability beyond that required of the Licensed Control Room Operator.

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6.1.2 Licensed operator training consists of the following elements:

- a. Fundamentals Training
- b. Systems Training
- c. Simulator Training and Certification
- d. Operating Practices Training
- e. Operator Theory Review
- f. Mitigation of Core Damage

6.1.3 The Senior licensed operator training consists of the same elements found in licensed operator training plus additional instruction in supervisory skills.

6.2 Licensed Operator Training

6.2.1 Prerequisites

- a. Medical - The candidate's physical condition and general health are not such as might cause operational errors endangering public and safety. This determination shall be made in accordance with Reference 3.6.
- b. Education - High School diploma or equivalent.
- c. Screening - Each candidate shall meet the requirements established in Reference 3.9.
- d. Experience - At least two years of power plant experience including at least one year of nuclear power plant experience. At least six months of this nuclear power plant experience must be at the Grand Gulf Nuclear Station. A maximum of two years of power plant experience may be fulfilled by academic or related technical training on a one-for-one basis. In all cases, experience shall meet the requirements established in References 3.3 and 3.11.

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e. Credentials - Candidate must satisfy one of the following criteria:

- (1) GGNS certified NOB.
- (2) Successfully completed navy nuclear training program or equivalent.
- (3) Obtained a degree at an accredited college or University or simulator institution with a major in a related area.
- (4) Satisfactorily completed a training program for reactor operators at a commercial reactor or commercial reactor training facility.
- (5) Hold or have held a reactor operator's license on a similar commercial facility or equivalent.

6.2.2 Training

a. Nuclear Fundamentals

The licensed operator candidate shall receive approximately twelve weeks of classroom training in the science and engineering subjects listed below:

- (1) Mathematics
- (2) Classical Physics
- (3) Atomic and Nuclear Physics
- (4) Reactor Theory
- (5) Chemistry
- (6) Thermodynamics, Heat Transfer and Fluid Flow
- (7) Plant Materials

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- (8) Radiation Detection
- (9) Radiation Protection
- (10) Basic Electronics and Electricity
- (11) Instrumentation and Controls

During the Fundamentals Training phase, written examinations should be given at the conclusion of each subject area. At the conclusion of the Fundamentals Training phase, a comprehensive written examination should be given.

A licensed operator candidate must have an overall average of 80% in order to satisfactorily complete this phase of training.

Exceptions to the above criteria may be granted for those candidates who have successfully completed the Memphis State Nuclear Reactor Fundamentals Course or those candidates who have successfully completed the U.S. Naval Nuclear Power School Programs. A candidate may also satisfy the requirements for fundamentals training by successfully passing written examinations over the course material.

b. Systems Operations Training

The licensed operator candidate shall receive approximately eight weeks of detailed classroom presentations covering each of the GGNS systems over which the licensed control room operator has control or cognizance. This training is designed such that upon completion, the student should be able to discuss the following topics for each of the plant systems:

- (1) Purpose of the system, including design bases
- (2) System components, including locations
- (3) Normal and alternate system lineups
- (4) Normal and alternate power supplies
- (5) Associated limits and alarms
- (6) Interrelationships with other systems
- (7) Automatic features of system operation

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- (8) Associated instrumentation, indications, and controls
- (9) Failure modes of controls and instruments
- (10) Normal values for significant parameters
- (11) Related Technical Specifications
- (12) Related operating procedures

Written examinations must be given during Systems Training. Successful completion of the Systems Training requires an average grade of 80%. An individual may meet the requirements for Systems Training by successfully passing written examinations on each phase of the material.

c. Simulator Training

Licensed operator candidates shall participate in simulator training which prepares the individual to proficiently conduct routine evolutions and carry out abnormal/emergency action from the Control Room. The simulator utilized in this program should have operating characteristics and Control Room design similar to those of the Grand Gulf Nuclear Station. Simulator training should provide a minimum of 80 contact hours on the control panels.

Simulator training emphasizes plant transients and casualty response. In addition to routine startup and shutdown evolutions, the following faults and casualties should be discussed, practiced, and critiqued:

- (1) Reactor Scram
- (2) Turbine or generator trip
- (3) Loss of coolant, including large and small leaks located inside and outside of primary containment (including leak rate determination)

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- (4) Loss of coolant flow/natural circulation
- (5) Loss of all feedwater
- (6) Nuclear instrumentation failure(s)
- (7) Non-nuclear instrumentation failure(s)
- (8) Loss of protective system channel(s)
- (9) Mispositioned control rod(s) (or rod drops)
- (10) Inability to drive control rods
- (11) Conditions requiring use of standby liquid control system
- (12) Fuel cladding failure or high activity in reactor coolant
or off-gas
- (13) Malfunction of automatic control system(s) which affect
reactivity
- (14) Malfunction of reactor coolant pressure/volume control
system
- (15) Loss of instrument air
- (16) Loss of electrical power and/or degraded power sources
- (17) Loss of condenser vacuum
- (18) Loss or standby service water
- (19) Loss of shutdown cooling
- (20) Loss of component cooling system or cooling to an
individual component

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- (21) Loss of normal feedwater or normal feedwater system failure
- (22) Main steam line break (inside or outside containment)
- (23) Manual control of feedwater during startup and shutdown
- (24) Power changes due to manual changes in control rod position or recirculation flow.

Exercises involving multiple failures and/or operator error should also be included. Utilization of applicable plant procedures and Technical Specifications during the formal training exercise should be maximized.

Candidate performance during simulator training is evaluated by the instructor. Successful completion of simulator training requires a performance examination to certify the individual's ability.

When completion of the license candidate's simulator training is more than six months prior to the scheduled license examination, the candidate must attend a simulator refresher course. This training should emphasize overall plant operation during both normal and abnormal operation.

d. Operating Practices Training

Each licensed operator candidate shall gain experience in plant operation and casualty response through a combination of in-plant on-shift training and classroom presentations/discussions. This training is accomplished in three phases:

- Administrative Requirements Training
- Plant Operation and Casualty Response Training
- Control Room training

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- (1) Administrative Requirements Training - Each license candidate shall receive approximately one week of training in the administrative procedures, bases, policies, and practices which affect the Licensed Control Room Operators. This training should cover such topics as:
 - (a) Shift turnover
 - (b) Operator logs
 - (c) Maintaining cognizance of plant system status
 - (d) Quality assurance
 - (e) Tagout procedure
 - (f) Reports and notification
 - (g) Shift duties and responsibilities
 - (h) Use of procedures
 - (i) Health Physics procedures
 - (j) Radioactive Material Control procedures
 - (k) Effluent release limits and bases
 - (l) Facility license and design bases

Successful completion of the Administrative Requirements Training Course requires an average grade of 80%. An individual may meet the requirements for this training by successfully passing an examination over the course material.

- (2) Plant Operation and Casualty Response Training - Each licensed operator candidate shall receive approximately three weeks of classroom training on the following subjects:
 - (a) Normal, Abnormal and Emergency Operating and their bases
 - (b) Plant Transients and Trend Analyses

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- (c) Site Emergency Plan
- (d) Calculation of release rates
- (e) Safety Limits, Limiting Safety System Settings, and Limiting Conditions for Operation, and bases.
- (f) Consequences of operating with parameters outside their normal bands.
- (g) Impact on abnormal system lineups or availability on operations or casualty control.
- (h) Response to multiple or compound failures.

Successful completion of the Plant Operation and Casualty Response Training course requires an average grade of 80%.

An individual may meet the requirements for this training by satisfactorily passing an examination on each phase of the course material.

- (3) Control Room Training - Each licensed operator candidate shall meet the requirements of (a) or (b) below.
 - (a) Prior to initial plant criticality, candidates not holding or having held an NRC License or having qualified in the Navy Nuclear Power Program as a Reactor Operator (RO), Engineering Watch Supervisor (EWS), or Engineering Officer Of the Watch (EOOW) shall spend at least four weeks at an operating BWR (should be at or above 20% power) observing the day-to-day operation of the plant. The candidate shall be under the direct supervision and guidance of a licensed individual (depending on the position for which the candidate is in training) in accordance with 10 CFR, PART 55.9(b).

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The licensed operator candidate will gain experience in the operation of the Grand Gulf Nuclear Station through participation in plant operating procedure preparation and verification and/or preoperational testing of plant systems. In addition, each candidate will be provided with a Control Room Operator Qualification Card which contains knowledge factors to be accomplished/discussed while in an on-shift training status.

- (b) After initial plant criticality, each licensed operator candidate shall spend at least three months on shift in a training status in the Control Room. During this period, the candidate shall carry out the duties of a Licensed Operator or Senior Operator under the direct supervision and guidance of a Licensed Operator or Senior Operator. The candidate's performance must be monitored by the Shift Supervisor who must provide a written evaluation of the candidate upon the conclusion of this training phase. The evaluation should consist of the evolutions performed as well as the supervisor's overall evaluation of the candidate. Each student will be provided with a Control Room Operator Qualification Card which lists the knowledge factors to be discussed/accomplished while in this onshift training. This qualification card must be completed prior to the candidates licensing examination. It shall be documented and maintained in accordance with Training Section Procedures.

e. Operator Theory Review

Each license candidate shall receive approximately three weeks of classroom training in theory areas pertinent to the operator's role and responsibilities. This training should cover the following subject areas:

- (1) Reactor Theory and principles of Nuclear Power Plant Operations
- (2) Fundamentals of thermodynamics, Heat Transfer and Fluid Flow.

Successful completion of this course requires an average grade of 80%. An individual may satisfy the requirement for this training by satisfactorily passing an examination on each phase of the training in the course.

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f. Mitigating Core Damage

Each license candidate shall receive approximately two weeks of classroom training in the use of installed plant systems to control and mitigate an accident in which the core is severely damaged. This training should cover subjects in the following areas:

- (1) Core cooling mechanics
- (2) Damaging Operating conditions
- (3) Recognizing Core Damage/Critical Plant Parameters
- (4) Hydrogen Hazards
- (5) Neutron Monitoring/Core Recriticality
- (6) Radiation Hazards/Radiation Monitoring
- (7) BWR Lessons Learned

Successful completion of this course requires an average grade of 80%. An individual may satisfy the requirement for this training by satisfactorily passing an examination covering the areas taught in the course.

6.2.3 Evaluations

- a. Prior to the NRC license examination, each license candidate is administered an NRC style, comprehensive written and oral examinations to determine the individual's ability to operate the plant in a safe and competent manner. Based upon the examination results, an evaluation is made of the candidate's weaknesses and upgrade training assigned to correct those weaknesses.
- b. Before the NRC administered licensing examination is taken, the candidate's overall performance in the Licensed Operator Training Program is reviewed by the Operator Training Evaluation Committee (OTEC). This committee is comprised of at least three individuals, one of which should hold or have held a Senior Reactor Operator License on a commercial boiling reactor. As a minimum, the committee should be chaired by the Assistant Plant Manager and contain a designated representative of the Training Superintendent and a designated representative of the Operations Superintendent. The Operator Training Evaluation Committee shall review the candidate's qualification

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record to verify that all NRC License examination prerequisites are met and evaluate the candidate's ability to safely and competently operate the plant and obtain the required license. If it is decided that the candidate can safely and competently operate the plant and possesses the ability to pass the license examination, the committee chairman will forward the candidate's qualification record to the Plant Manager, who is responsible for certifying the competency of each license candidate to the Vice President, Nuclear Production.

If it is decided that the candidate is deficient in certain knowledge areas, he may be dropped from the license training program or given upgrade training. He must successfully pass a written or oral examination in deficient areas prior to being re-evaluated by the CTEC.

- c. The Plant Manager must review the candidate's qualification record. If he concurs with the OTEC evaluation and recommendation, he must certify the competency of each license candidate to the Vice President, Nuclear Production.

6.2.4 Documentation

- a. A License Candidate Qualification Record shall be maintained for each license candidate. These shall be maintained in accordance with Training section procedures.
- b. Completed prerequisite requirements shall be verified in accordance with Plant Administrative Procedure 01-S-12-2, Screening of Plant Staff. Prerequisites completed prior to MP&L employment must be verified by the Personnel Department. Documentation of completion of the verification shall be by memo to the Training Superintendent. These memos must be entered in the Training Record and the record number (TRN) entered on the Qualification Record.
- c. Documentation of plant certifications, completed courses and evaluations shall be in accordance with Plant Administrative Procedure, 01-S-04-14, Training Records.
- d. The following documentation is required:
 - (1) Records of completed courses
 - (2) Records of completed examinations
 - (3) Records of evaluations
 - (4) License candidate Qualification Record
 - (5) License candidate on shift qualification card

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6.3 Senior License Training

6.3.1 Prerequisites

- a. Medical - The candidate's physical condition and general health are not such cause as might operational errors endangering public health and safety. This determination shall be made in accordance with Reference 3.6.
- b. Education - High School diploma or equivalent.
- c. Screening - Each candidate shall meet the requirements established in Reference 3.9.
- d. Experience - At least four years power plant experience. Prior to initial plant criticality, at least one year of this power plant experience shall be nuclear power plant experience. After initial plant criticality, each senior licensed operator candidate shall have at least two years of nuclear power plant experience. A maximum of two years of power plant experience may be fulfilled by academic or related technical training on a one-for-one basis in accordance with References 3.10 and 3.11. At least six months of the power plant experience must be at GGNS.
- e. Credentials - Candidate must satisfy one of the following criteria:
 - (1) Licensed reactor operator at GGNS for one year prior to taking NRC SRO Exam.
 - (2) Satisfactorily completed navy nuclear training program or equivalent.
 - (3) Obtained a degree at an accredited college, university, or similar institution with a major in a related area.
 - (4) Satisfactorily completed a training program for reactor operations at a commercial reactor or commercial reactor training facility.
 - (5) Hold or have held a license on a similar commercial facility or equivalent.

6.3.2 Training

- a. In addition to the training required for licensed operators in section 6.2.2, each senior operator candidate shall complete the following training:
 - (1) Supervisory Training - Each senior licensed operator candidate must receive at least one week of training in

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the supervisory skills necessary to carry out the administrative responsibilities of the Senior Control Room Operator. This training should include such topics as:

- (a) Motivation of Personnel
- (b) Professionalism/Attitude/Morale
- (c) Standards of Performance
- (d) Personnel Development
- (e) Combating Stress and Boredom
- (f) Crisis Management/Stress Management
- (g) Interpersonal Communication (Verbal/Non-Verbal)
- (h) Listening/Feedback
- (i) Sensitivity
- (j) Written Communication
- (k) Problem Analysis
- (l) Decision Making
- (m) Planning and Organization

6.3.3 Documentation

- a. Records for senior license training shall be maintained as specified in section 6.2.3.

13.2 TRAINING

13.2.1 Grand Gulf Nuclear Station (GGNS) Staff Training Program

The GGNS Staff Training Program has been developed and implemented to ensure that sufficient personnel are trained and qualified to safely operate and maintain the plant throughout its design life. Guidance for the development of the training program was obtained using the American National Standards Institute Standard N18.1-1971, 10 CFR 55, and NUREG-0737, Clarification of TMI Action Plan Requirements. The program is designed to provide training commensurate with an individual's background and proposed position on the staff.

The plant Training and Administrative Superintendent is responsible for the overall program. He designates qualified individuals to prepare lectures, tests, and examinations, and to provide performance evaluations and documents for various aspects of the training program. The detailed program description which follows is divided into three sections relating to the categories of personnel being trained: (1) Licensed Personnel, (2) Unlicensed Technical Personnel, and (3) General Employees.

The program outlined below is specifically written for GGNS Unit 1. Some personnel originally assigned to Unit 1 may be later reassigned to Unit 2. Since the two units are expected to be identical in design, the Unit 1 training program will be directly applicable to Unit 2 systems. Because of this similarity, personnel reassigned to Unit 2 will not repeat the portions of the training program they have previously completed. They will, however, participate in a training program designed to cover any differences between Unit 1 and Unit 2 and familiarize operators of both units with two-unit operation and shared systems. MP&L intends to request a waiver for the examination and test requirements of Unit 2 personnel meeting the requirements of 10 CFR 55 for Unit 1. The duration of listed courses are typical, but some may vary depending on the intensity of the course instruction and needs of the students.

13.2.1.1 Program Description

13.2.1.1.1 Licensed Personnel

The Licensed Operator Training Program is designed to ensure that the individuals who operate the controls of a nuclear reactor are competent to do so. This competence entails:

- a. Understanding of the underlying principles in the various engineering disciplines which relate to their responsibilities

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- b. Knowledge of the systems and components over which they have responsibility and control
- c. Knowledge of the procedure established for controlling the plant
- d. Skill in manipulating plant controls

The Senior Licensed Operator Training Program is designed to ensure that the individual who directs the activities of the licensed operators possesses an understanding of principles, knowledge of systems and components, and analytical ability beyond that required of the licensed control room operator.

All license candidates receive training in the following areas:

- a. Nuclear Fundamentals Training
- b. Systems Operation Training
- c. Simulator Training and Certification
- d. Operating Practices Training
- e. License Examination Preparation

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In addition to the above, senior licensed operator candidates receive additional training in the areas of:

- f. Procedures and Bases
- g. Plant Operation and Casualty Response
- h. Supervisory Skills

13.2.1.1.2 Nuclear Fundamentals Training

All license candidates shall receive approximately 12 weeks of classroom training in the science and engineering subjects listed below:

- a. Mathematics
- b. Classical Physics
- c. Atomic and Nuclear Physics
- d. Reactor Theory
- e. Chemistry

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- f. Heat Transfer, Thermodynamics, and Fluid Flow
- g. Plant Materials
- h. Radiation Detection
- i. Radiation Protection
- j. Basic Electronics and Electricity
- k. Instrumentation and Controls

During the fundamentals training phase, written examinations should be given at the conclusion of each subject area. These written examinations should be supplemented by written quizzes administered throughout the presentation of each subject. At the conclusion of the fundamentals training phase, a comprehensive written examination is given. All license candidates shall score at least 80 percent on all examinations in order to satisfactorily complete this phase of training.

13.2.1.1.3 Systems Operation Training

All license candidates shall receive approximately eight weeks of detailed classroom presentations covering each of the GGNS systems over which the licensed control room operator has control or cognizance. This training is designed such that upon completion, the student should be able to discuss the following topics for each of the plant systems:

- a. Purpose of the system, including design bases
- b. System components, including locations
- c. Normal and alternate system lineups
- d. Normal and alternate power supplies
- e. Associated limits and alarms
- f. Interrelationships with other systems
- g. Automatic features of system operation
- h. Associated instrumentation, indications, and controls
- i. Failure modes of controls and instruments
- j. Normal values for significant parameters

- k. Related technical specifications
- l. Related operating procedures

Written examinations are given during the systems operation training phase. In addition, oral examinations are given periodically on system design, function, and operation. Successful completion of the systems operation training requires a passing grade of 80 percent on all written examinations and satisfactory performance on all oral examinations.

13.2.1.1.4 Simulator Training

All license candidates shall participate in a Simulator Training Program which prepares the individual to proficiently conduct routine evolutions and carry out abnormal/emergency action from the control room. The simulator utilized in this program should have operating characteristics and control room design similar to those of the Grand Gulf Nuclear Station. The Simulator Training Program requires a minimum of 80 hours on the control panel.

The Simulator Training Program shall emphasize plant transients and casualty response. In addition to routine startup and shutdown evolutions, the following faults and casualties, as a minimum, should be discussed, practiced, and critiqued:

- a. Reactor scram
- b. Turbine or generator trip
- c. Loss of coolant, including large and small leaks located inside and outside of primary containment (including leak rate determination)
- d. Loss of coolant flow/natural circulation
- e. Loss of all feedwater
- f. Nuclear instrumentation failure(s)
- g. Non-nuclear instrumentation failure(s)
- h. Loss of protective system channel(s)
- i. Mispositioned control rod(s) (or rod drops)
- j. Inability to drive control rods
- k. Conditions requiring use of standby liquid control system
- l. Fuel cladding failure or high activity in reactor coolant or off-gas

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- m. Malfunction of automatic control system(s) which affect reactivity
- n. Malfunction of reactor coolant pressure/volume control system
- o. Loss of instrument air
- p. Loss of electrical power and/or degraded power sources
- q. Loss of condenser vacuum
- r. Loss of service water (if required for safety)
- s. Loss of shutdown cooling
- t. Loss of component cooling system or cooling to an individual component
- u. Loss of normal feedwater or normal feedwater system failure
- v. Main steam line break (inside or outside containment)

Exercises involving multiple failures and/or operator error are also included. Utilization of applicable plant procedures and technical specifications during the formal training exercise is maximized.

Candidate performance during simulator training is evaluated by the instructor as each evolution is conducted. Successful completion of simulator training requires a performance examination to certify the individual's ability to safely and competently manipulate the controls of a BWR on a reactor operator level during normal, abnormal, and emergency conditions and to understand all indications available during each evolution.

13.2.1.1.5 Operating Practices Training

Each license candidate shall gain experience in plant operation and casualty response through a combination of in-plant on-shift training and classroom presentations/discussions. This training is accomplished in three phases:

- a. Administrative Requirements Training
- b. Plant Operation and Casualty Response Training
- c. In-Plant Training

13.2.1.1.5.1 Administrative Requirements Training

Each license candidate shall receive at least 1 week of training in the administrative procedures, policies, and practices which affect the licensed control room operator. This training covers such topics as:

- a. Shift Turnover
- b. Operator Logs
- c. Verification of Plant System Status
- d. Quality Assurance
- e. Tagout Procedure
- f. Reports and Notification
- g. Shift Duties and Responsibilities
- h. Use of Procedures
- i. Health Physics Procedures
- j. Radioactive Material Control Procedures
- k. Effluent Release Limits and Bases
- l. Facility License and Design Basis

Successful completion of the Administrative Requirements Training Course requires a passing grade of 80 percent on all written examinations.

13.2.1.1.5.2 Plant Operation and Casualty Response Training

Each license candidate shall receive at least 2 weeks of classroom training on the following subjects:

- a. Normal, abnormal, and emergency operating procedures
- b. Plant transients and trend analysis
- c. Recognition and mitigation of the consequences of core damage
- d. Site Emergency Plan
- e. Calculation of release rates
- f. Safety limits, limiting safety system settings, and limiting conditions for operation

Successful completion of the Plant Operation and Casualty Response Training Course requires a passing grade of 80 percent on all written examinations.

13.2.1.1.5.3 In-Plant Training

Each license candidate shall spend a period of time on shift in a training status under the direct supervision and guidance of the licensed control room operator. The objective of this training period is for each candidate to gain experience in the routine operation of a nuclear power plant.

- a. Prior to initial criticality, candidates not holding or having held an NRC License or having qualified in the Navy Nuclear Power Program shall spend at least 4 weeks at an operating BWR (should be at or above 20 percent power) observing the day-to-day operation of the plant. The candidates shall be under the direct supervision and guidance of an individual who is qualified in accordance with 10 CFR 55.9 (b). Each candidate should complete a checklist detailing those operations/evolutions to be performed, simulated, observed, and/or discussed. This checklist contains specific requirements in such areas as:

1. Plant operation from the control room
2. Local control and operation of equipment
3. Surveillance testing
4. System valve and electrical lineups
5. System component operation (i.e., pump startup and shutdown)
6. System interactions and indication

Each checklist requirement is signed off by the qualified individual observing and supervising the candidate as the requirement is being accomplished.

The license candidate shall also gain experience in the operation of the Grand Gulf Nuclear Station through participation in plant operating procedure preparation and verification and/or pre-operational testing of plant systems. In addition, each candidate is provided with a control room operator qualification card which contains knowledge factors and practical factors to be accomplished/discussed

while in an on-shift training status. The candidate's performance while on shift is monitored by the shift supervisor who shall provide an evaluation of the candidate's operating abilities at the conclusion of this training phase.

- b. After initial plant criticality, each license candidate shall spend at least 3 months on shift in a training status in the GGNS control room. During this period, the candidate shall carry out the duties of a control room operator under the direct supervision and guidance of the licensed control room operator. The candidate's performance is monitored by the shift supervisor who shall provide an evaluation of the candidate upon the conclusion of this training phase. Each student is provided with a control room operator qualification card which lists the knowledge factors and practical factors to be discussed/accomplished while in this on shift training.

13.2.1.1.6 License Examination Preparation

Within a reasonable period of time (typically 6 months), prior to the candidate's proposed NRC license examination date, each license operator candidate attends a brief simulator refresher course. This training emphasizes overall plant operation during both normal and abnormal situations.

Upon completion of the simulator refresher training, each license candidate is administered NRC-style comprehensive written and oral examinations to determine the individual's ability to operate the plant in a safe and competent manner. Based upon the examination results, an evaluation shall be made of the candidate's weaknesses and a training program is developed to correct those weaknesses.

~~Before the NRC-administered licensing examination is taken, the candidate's overall performance in the Licensed Operator Training Program shall be reviewed by an operator training evaluation board.~~ The operator training evaluation board reviews the candidate's training record to verify that all NRC license examination prerequisites are met and evaluates the candidate's ability to safely and competently operate the plant and obtain the required license. If the board decides to retain the individual in the training program, the candidate is given remedial training in those subject areas of demonstrated weakness and shall score at least 80 percent on a written reexamination in those areas prior to being reevaluated. If it is decided that the candidate can safely and competently operate the plant and possesses the ability to pass the required license examination, the board will forward the candidate's evaluation and training record to the Plant Manager, who is

responsible for certifying the competency of each license candidate to the Assistant Vice President - Nuclear Production.

13.2.1.1.7 Senior Operator Training

13.2.1.1.7.1 *Proc & Bases? 10 CFR 55?* Plant Operation and Casualty Response Training

Each senior license candidate receives additional classroom training on the following subjects:

- a. Consequences of operating with parameters outside their normal bands
- b. Impact on abnormal system lineups or availability on operations and casualty control
- c. Response to multiple or compound failures

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13.2.1.1.7.2 Supervisory Training

Each senior license candidate receives at least 1 week of training in the supervisory skills necessary to carry out the administrative responsibilities of the senior control room operator. This training includes such topics as:

- a. Motivation of personnel
- b. Professionalism/attitude/morale
- c. Standards of performance
- d. Personnel development
- e. Combatting stress and boredom
- f. Crisis management/stress management
- g. Interpersonal communication (verbal/non-verbal)
- h. Listening/feedback
- i. Sensitivity
- j. Written communication
- k. Problem analysis
- l. Decision making
- m. Planning and organizing

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13.2.1.1.8 Onsite Training

The Onsite Licensed Operator Training Program will be conducted under the supervision of the Training and Administrative Superintendent and consists of approximately 14 months of classroom lectures and field training. The onsite training program provides all license candidates with an in-depth study of GGNS systems and equipment, GGNS nuclear characteristics, GGNS normal, off-normal, emergency, and administrative procedures, and technical specifications prior to NRC examinations. Licensed personnel supervising or performing fuel-handling operations will receive training on fuel-handling equipment and procedures prior to performing fuel-handling operations.

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Instructors for the various onsite training lectures will be supplied by the Grand Gulf Training Section or consultants. Selection of the particular individual to conduct a specific training lecture will be based upon individual availability and knowledge of the subject matter involved. Permanent training center instructors and consultants assigned to training, who, after initial criticality will teach systems, integrated responses, transients, and simulator courses to license candidates or NRC-licensed personnel, shall either demonstrate or have previously demonstrated their competence to the NRC by successful completion of a senior operator examination prior to teaching licensed operators. Prior to initial criticality, these instructors will, as a minimum, be certified to the senior reactor operator level.

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A brief simulator refresher training course, typically 1 to 2 weeks, is scheduled for all license candidates at a BWR-6 simulator prior to the licensing examination. Written and oral examinations will be administered as part of this phase of training.

Various Licensed Operator Training Program events have been scheduled to be conducted at specified times prior to fuel load. This "keying" of the training program to fuel load is done to minimize the possibility that the training programs will end substantially before fuel load. If fuel load is delayed, the Training and Administrative Superintendent shall implement selected portions of the Licensed Operator Requalification Training Program to ensure that operator knowledge level does not deteriorate. This selected training will consist of topics selected from the subject areas listed in subsection 13.2.1.1.1.

13.2.1.1.9 BWR Refueling Training

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Those candidates for an NRC license, who will be involved in refueling operations, will participate as trainees in a fuel-handling training program which will be designed to acquaint each student with the procedures, skills, and equipment required for fuel handling evolutions.

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13.2.1.1.10 Coordination with Preoperational Tests and Fuel Loading

The schedule for each part of the training program for each section of plant employees is being correlated as closely as possible with the schedule for preoperational testing and fuel loading.

13.2.1.1.11 Practical Reactor Operation

Practical (on-the-job) plant operation for license candidates will commence with the preoperational test program. Practical reactor operation for licensed personnel will commence with fuel loading, progress through the startup test program, and continue for retraining as described in subsection 13.2.2.

13.2.1.1.12 Previous Nuclear Training

Other nuclear training programs or experience that satisfy the intent of the program outlined in subsection 13.2.1.1.1 may be substituted instead of portions of the training outlined for reactor operator and senior reactor operator candidates. Examples of such training programs or experience that would be permissible for substitution instead of portions of the training as described in subsection 13.2.1.1.1 are: attainment of a baccalaureate or higher degree in the fields of nuclear engineering or nuclear sciences; extensive participation in the design or design review of the station in nuclear-related areas; holding or having held a reactor operator's or senior reactor operator's license at a comparable reactor facility not subject to NRC licensing; e.g., reactor facilities operated by the military services or Department of Energy; or satisfactory completion of an NRC-administered written examination and operating test at a comparable licensed reactor facility without issuance of a reactor operator's or senior reactor operator's license; or certification of satisfactory completion of an NRC-approved training program which utilizes a complete and accurate nuclear power plant simulator as part of this program.

13.2.1.1.13 Preparation of Station Operating Procedures

GGNS operations personnel will write or review station operating procedures with technical assistance furnished by General Electric Company and other consultants as may be required. This experience will familiarize personnel with the details of the reactor, turbine generator, and associated systems.

13.2.1.1.14 Preoperational Testing of Equipment

Preoperational testing of plant equipment will provide station operators with nuclear power plant operating experience on station systems and equipment prior to fuel loading. Training emphasis will be placed in areas of component testing, system flushing, hydrostatic tests, system checkouts, and functional tests as system and component availability permits.

13.2.1.1.15 Training During Low Power Testing

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As described in Section 14.2, plant operating personnel will participate in the preoperational and startup test programs, gaining hands-on experience in operating plant equipment and dealing with operational transients and problems.

The culmination of the preoperational test program is the ECCS integrated initiation during loss of offsite power test. Subsection 14.2.12.1.44 describes this test. To enhance the training benefit of this test, each shift will participate in one of the portions of the test. A training session will be held prior to the commencement of the test and this will be followed by preshift briefings during the test.

The cold functional test program described in subsection 14.2.10.1.2 provides additional opportunities for training. The cold functional tests are performed using plant procedures and are controlled and documented using checklists. The checklist provides a signoff to document that each shift has received training and experience on specified systems.

During the startup test program, tests performed cold or with an open vessel, during heatup or at Test Condition 1 (see Table 14.2-3), provide training opportunities for operators prior to exceeding 5 percent rated core thermal power.

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Licensed operators on each shift will:

- a. See at least one pressure controller transient (STI22)
- b. Operate the RCIC (STI14)
- c. Operate the recirculation flow control system (STI29)

Other testing will be balanced as much as practicable to ensure even exposure to testing for all operating shifts. A training session will be held for all licensed personnel prior to the commencement of the low power test program. This will be followed by preshift briefings prior to the performance of the various low power tests.

13.2.1.1.16 Diesel Engine Training for Licensed and Non-Licensed Operators

All licensed and non-licensed operator personnel responsible for the safe operation of the emergency diesel generators shall

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have successfully completed the manufacturer's school or the equivalent for that component. Operator personnel will be instructed, as a minimum, in at least the areas listed below:

- a. Engine construction and materials
- b. Auxiliary systems associated with the engine
- c. Normal and abnormal operating characteristics
- d. Diesel engine startup and loading procedure
- e. Diesel engine protective features, overload conditions
- f. Control systems
- g. Importance of diesel engine pre-lube system
- h. Basic troubleshooting
- i. Importance of trends in the operating logs
- j. Hazards of no load or low load conditions

13.2.1.2 Training Programs for Non-Licensed Personnel

Selected technical, professional, and supervisory personnel are provided the necessary training to satisfy the applicable requirements of their particular position. This is accomplished by assigning individuals to specific courses of instruction that best fit their education, previous experience, and intended position. In addition to the specific courses described in the following subsection, technical and professional staff

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personnel are scheduled to attend portions of the Licensed Operator Training Programs to enable them to become familiar with Grand Gulf plant operation.

13.2.1.2.1 BWR Control Rod Drive System Maintenance

This course is designed to train responsible maintenance supervisors and senior mechanics in the specialized tasks of control rod drive and hydraulic control unit maintenance. The instructor is a GE Training Engineer thoroughly versed and experienced in actual component maintenance. Heavy emphasis is placed on student participation, and each student is required to disassemble and assemble actual components using the proper tools and maintenance procedures. Selected maintenance personnel are designated to attend this course.

13.2.1.2.2 Nuclear Instrumentation

This course is designed to train instrument technicians and supervisors in the maintenance techniques of BWR nuclear instrumentation and controls. The course consists of classroom lecture integrated with laboratory work and is currently 5 weeks long. Experienced GE nuclear instrumentation startup and design instructors provide the instruction for this course. Selected technicians and engineers have completed this course.

13.2.1.2.3 Station Nuclear Engineering

This 5-week course is designed to train selected engineers and plant supervisors in the techniques of fuel calculations and management, startup testing, and assessment of nuclear performance. The course is taught by the General Electric Company and consists of lectures and studies covering the following topics: process computer, Buckle, reactor behavior, thermal hydraulics, technical specifications, LPRM calibration, core thermal limit calculations, rod worth, reactivity monitoring and shutdown margin, fuel shuffling, preoperational and startup test program, and reload during refueling outage.

13.2.1.2.4 BWR Chemistry

This 12-week course is designed to prepare and familiarize certain plant chemists with the radiochemical and analytical chemistry techniques of liquids and gases associated with operation of BWRs. The course includes BWR water chemistry, waste disposal, effluent monitoring, process, and laboratory instrument calibrations and studies in laboratory work. Compliance with and interpretation of the chemical and radiochemical aspects of the technical specifications, licenses, and plant warranties is also covered. Additionally, the course prepares the students for training their own laboratory technicians in analytical techniques, use of equipment, and procedures required to monitor the chemical aspects of BWR operation.

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Experienced GE startup chemistry instructors teach this course at the Vallecitos Nuclear Center. The station chemist has completed this course.

13.2.1.2.5 Process Instrumentation and Control

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This 4-week course is designed to train technicians and responsible supervisory personnel in the theory and application of process instrumentation and control systems used in BWR nuclear steam supply systems. The course consists of classroom training integrated with laboratory work and is taught by experienced GE instrumentation startup and design instructors. Selected I&C technicians and engineers have completed this course.

13.2.1.2.6 Radiological Engineering

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This course, currently 8 weeks long, is designed to train radiation protection personnel in establishing the radiation protection program. It is a course of instruction in radiation monitoring methods, monitoring of the environs, internal and external dosimetry, bioassay, applied radioanalyses, applied shielding design, radiation safety administration procedures and licensing and compliance administration. The course is taught by General Electric specialists. The Radiation Protection Supervisor has completed this course.

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13.2.1.2.7 Process Computer Training

This series of courses is intended to train a sufficient number of plant personnel in areas such as the Honeywell 4400 computer, User Programming, RT MOS Analysis, SEER, and computer maintenance. These and other courses are taught by Honeywell training instructors in Phoenix, Arizona. Selected reactor engineers and technicians are required to complete the various Honeywell courses.

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13.2.1.2.8 Vendor Schools

Selected plant technicians will attend various vendor schools on specialized equipment maintenance and troublesome techniques such as malfunction diagnosis, protective relays, and nondestructive evaluation.

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13.2.1.2.9 Additional Training

All Health Physics Technicians will receive formal training at the GGNS site related to radiation protection to allow them to carry out safely and efficiently their assigned responsibilities in accordance with established policies and procedures. The course includes, but is not limited to, the following subject areas:

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1. Radiation control
2. Contamination control

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3. Airborne radioactivity control
4. Medical program
5. Radioactive waste disposal
6. Radioactive material shipment
7. Radiation protection forms, records, and reports
8. Emergency plan and instructions

13.2.1.2.10 Shift Technical Advisor Training Program (STA)

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The training program for the Shift Technical Advisors (STA) will last approximately 20 weeks and include the following:

a. Plant Systems (6 weeks)

The Plant Systems course is an in-depth presentation of the Grand Gulf Nuclear Station plant systems. The course includes system construction, design aspects, basic system operation, and location of major components and their respective operating/control station.

b. Station Nuclear Engineering (5 weeks)

This course is designed to train selected engineers and plant supervisors in the techniques of fuel calculations and management, startup testing, and assessment of nuclear performance. The course is taught by the General Electric Company at the plant site and consists of lectures and studies covering the following topics: process computer, Buckle, reactor behavior, thermal hydraulics, technical specifications, LPRM calibration, core thermal limit calculations, rod worth, reactivity monitoring and shutdown margin, fuel shuffling, preoperational and startup test program, and reload during refueling outage.

c. Management Supervisory Training (1 week)

This 1-week course is designed to provide management personnel with the skills necessary to cope with the day-to-day problems that arise with the supervision of personnel and stress management. The course covers such topics as communications, job satisfaction and morale, handling complaints and grievances, counseling, and stress management.

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d. Administrative Controls (4 weeks)

The administrative controls segment consists of a detailed presentation of the Grand Gulf Nuclear Station Administrative Procedures that pertain to the administrative activities necessary to operate the unit. Such topics as technical specifications, control and handling of radioactive materials, protective tagging, etc., will be covered.

e. General Operating Procedures (1 week)

The General Operating Procedures portion will contain the presentation of the Grand Gulf Integrated Operating Instructions, System Operating Instructions, Alarm Response Instructions, Emergency Plan and Site Security Plan.

f. Transient and Accident Analysis and Emergency Procedures (3 weeks)

This portion will give a detailed presentation of the transient and accident analysis section of the Grand Gulf Final Safety Analysis Report. The Emergency Procedures will be covered concurrent with transient and accident analyses so that an overall understanding can be obtained. Combined with these two topics will be an instructional period devoted to accessing and interpreting information supplied from the process computer.

g. STA Simulator Training (2½ weeks)

This 2½-week portion is designed to familiarize the STAs with a fundamental understanding of system and plant operation in a control room atmosphere. The time is split between actual control room operation and classroom presentations.

The STA Training Program is intended to be a short-term plan which ensures that technical expertise is available to the Shift Supervisor for matters dealing with accident/transient response of the GGNS plants. The long-range plan is to certify the Shift Superintendents to the level of STA at which time there may no longer be a need for a separate STA.

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13.2.1.2.12 General

In addition to the courses described previously, specific programs of instruction are developed to fulfill the needs of personnel assigned to each section, whether it be instrumentation, radiation protection, chemistry, or maintenance. The programs will be developed as the training requirements of each individual are defined.

13.2.1.2.13 Diesel Engine Training for Maintenance Personnel

All maintenance personnel responsible for the maintenance of the emergency diesel generators shall have successfully completed the manufacturer's school or equivalent on that component. These personnel will be instructed, as a minimum, in at least the areas listed below:

- a. Engine construction and materials
- b. Auxiliary systems associated with the engine
- c. Diesel engine protective features, overload conditions
- d. Control systems
- e. Importance of diesel engine pre-lube system
- f. Basic troubleshooting

Plant technicians also receive extensive training through participation in the preoperational testing program, startup, establishment of labs and shops, and on-the-job training associated with their plant specialty.

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13.2.1.3 General Employee Training

Each full-time employee who must enter the secured area of the plant and who has not received more intensive training in the subjects covered will attend an orientation course. The course will indoctrinate personnel with plant layout, controlled security, and radiation protection areas. It will also cover applicable sections of the security plan, emergency plan, fire protection, and radiation protection manuals. Temporary personnel, if periodically utilized, are also trained in the previous courses to the extent necessary to assure safe execution of their duties.

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Each employee who will enter radiation areas and who has not received more intensive training will attend a radiation protection course covering basic radiation theory, NRC and company radiation limits, exposure and contamination control, respiratory protection and safe radiological practices, or will be accompanied by a person who has passed the radiation protection course.

13.2.1.3.1 Temporary Plant Personnel Training

Temporary maintenance and service personnel, i.e., those who are not assigned to the Grand Gulf Nuclear Station on a day-to-day basis, will be trained in the areas listed in subsection 13.2.1.3 to the extent necessary to assure safe execution of their duties.

13.2.1.3.2 Consultant and Vendor Personnel

Consultant and vendor personnel will receive indoctrination training in those areas listed in subsection 13.2.1.3 to the extent necessary to safely execute their normal duties.

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13.2.1.3.3 General Employee Refresher Training

General employee refresher training for those items listed in subsection 13.2.1.3 will be provided to permanent plant employees on a biennial basis.

13.2.2 Regualification Program

A continuing regualification program for licensed operators and senior operators will be established and implemented in accordance with 10 CFR 55, Appendix A, no later than 3 months following the issuance of an operating license for the station.

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Licensed operators and senior operators will participate in the regualification program as described in subsections 13.2.2.1 and 13.2.2.2.

The regualification program cycle shall be based on a 2-year period with training distributed over that period as required.

Plant Staff personnel whose normal duties are at the station on a day-to-day basis and who hold a license to provide backup capability for the operating staff will participate in the regualification program except to the extent that their normal duties preclude the need for retraining in specific areas. Operations instructors will be enrolled in appropriate regualification programs to ensure that they are cognizant of current operating history, problems, and changes to procedures and administrative limitations.

As a minimum they shall:

1. Be administered the annual regualification exam and participate in the regualification lecture series based upon results of the annual regualification examination
2. Perform reactivity control manipulations as specified in subsection 13.2.2.1.2
3. Review changes to station design, procedures, and license as specified in subsection 13.2.2.1.4
4. Review station abnormal and emergency procedures as specified in subsection 13.2.2.1.5
5. Be evaluated at least once during the term of the license by oral examination

The GGNS Training and Administrative Superintendent is responsible for establishing and supervising the licensed operator regualification program.

13.2.2.1 Program Description

13.2.2.1.1 Program Content

A planned lecture series will be presented covering, as a minimum, those areas where written examinations indicate the need for additional training in the following subjects:

1. Theory and principles of operation
2. General and specific plant operating characteristics
3. Plant instrumentation and control systems

4. Plant protection systems
5. Engineered safety systems
6. Normal, abnormal, and emergency operating procedures
7. Radiation control and safety
8. Technical specifications
9. Applicable portions of 10 CFR
10. Station QA program as related to station operations
11. Heat transfer and fluid flow
12. Thermodynamics
13. Mitigation of accidents involving a degraded core
14. Understanding of reactor and plant transients.

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The lecture series will be presented by the Grand Gulf Training Section. The lecture series will, with the exception of special activity periods such as refueling outages or heavy vacation periods, be spread reasonably evenly throughout each 2-year retraining program. Lectures may be deferred due to unanticipated shutdowns with provisions being made for conducting deferred lectures at a later date. A minimum of six preplanned lectures will be scheduled each year.

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13.2.2.1.2 Reactivity Control Manipulations

Each licensed operator will, during the term of his license, perform a minimum of 10 reactivity control manipulations. The following items will be performed on an annual basis:

- a. Plant or reactor startups to the point that reactivity feedback from nuclear heat addition is noticeable and a controlled heatup rate is established
- b. Manual control of feedwater during startup or shutdown.
- c. Any significant (>10 percent) power changes in manual rod control or manual control of recirculation flow.
- d. Loss-of-coolant accidents
 1. Inside/outside containment and drywell
 2. Large/small, including leak rate determination
- e. Loss-of-coolant forced flow/natural recirculation
- f. Loss of all feedwater (normal and emergency)

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The following will be performed on a biennial basis:

- a. Plant Shutdown.
- b. Any reactor power change of 10 percent or greater where load change is performed with load limit control
- c. Loss of instrument air (if simulated plant specific)
- d. Loss of electrical power (and/or degraded power sources)
- e. Loss of condenser vacuum
- f. Loss of standby service water if required for safety
- g. Loss of RHR shutdown cooling
- h. Loss of component cooling system or cooling to an individual component
- i. Loss of normal feedwater or normal feedwater system failure
- j. Loss of protective system channel
- k. Mispositioned control rod or rods (or rod drops)
- l. Inability to drive control rods
- m. Conditions requiring use of emergency boration or standby liquid control system
- n. Fuel cladding failure or high activity in reactor coolant or offgas
- o. Turbine or generator trip
- p. Malfunction of automatic control system(s) which affect reactivity
- q. Malfunction of reactor coolant pressure/level control system
- r. Reactor scram
- s. Main steam line break (inside or outside containment)
- t. Nuclear instrumentation failure(s).

Each licensed senior operator will either manipulate the controls or direct/evaluate the activities of others during 10

reactivity control manipulations. Reasonable effort consistent with the operating requirements of the station will be made to provide a variety of reactivity changes for each operator.

In addition, control manipulations which meet the requirements of one or any combination of the following are considered as acceptable reactivity control manipulations:

1. Any plant or reactor startup, to the point at which reactivity feedback from heat addition is noticeable
2. Any heatup or cooldown of at least 100 F
3. Plant or reactor shutdown
4. Plant shutdown to reactor hot standby
5. Control rod sequence changes
6. Shutdown margin checks
7. Control rod scram insertion time tests
8. Any reactor power change of 10 percent or greater including testing of equipment where load changes are performed with control rods, "load selector" of EHC system, or where the recirculation system is in manual speed control
9. Plant and reactor operation that involves emergency or transient procedures where reactivity is changing
10. Refueling operations where fuel is moved within the core

If necessary, to provide a minimum of 10 reactivity control manipulations or a reasonable diversity in reactivity control manipulations, the GE/BWR-6 or GGNS simulator may be used to meet the reactivity control manipulation requirements of the regualification program.

13.2.2.1.3 Station Design Features

Each licensed operator and senior operator will demonstrate, in the performance of his duties, his satisfactory understanding of the operation of systems, components, and other apparatus in areas for which he has been licensed; and his knowledge of operating procedures pertaining to those systems or components.

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13.2.2.1.4 Station Design, Procedure, and Facility Changes

Each licensed operator and senior operator will be kept advised of station design changes, procedure changes, and station license changes appropriate to the technical requirements of an individual's license as defined in subsection 13.2.1.1.1. To ensure the individual's cognizance of such changes, any of the following methods of communication may be used:

1. Brief lectures conducted by the shift supervisors
2. Staff or section meetings
3. The required reading procedure
4. Preplanned lecture series

13.2.2.1.5 Off-normal and Emergency Procedure Review

Each licensed operator and senior operator will review the off-normal and emergency operating procedures on an annual basis. To ensure the individual's review of these procedures, any of the following methods may be used:

1. Actual performance under off-normal or emergency operating conditions
2. Simulated walk-through of the procedural steps necessary to cope with the situation
3. Brief lectures conducted by the Shift Supervisor
4. Drills utilizing a simulator
5. Preplanned lecture series
6. The required reading procedure

13.2.2.1.6 Regualification of Inactive Licensed Operators and Senior Operators

Licensed operators or senior operators whose normal duties are at the station on a day-to-day basis and who are involved in the daily activities at the station will be considered on "active status."

A licensed operator or senior operator who has been inactive for four or more months will, before resuming licensed activities, demonstrate his adequate knowledge of current station operations. This demonstration will be accomplished by his satisfactory completion of a written examination and/or oral examination given by a qualified member of station management.

An unsatisfactory result in one or both of these examinations will require that the individual receive additional training in those areas of his weakness and/or observe station operations for a minimum of 40 hours prior to reexamination. The nature of the additional training provided will be determined on the basis of the initial requalification examination results.

13.2.2.2 Requalification Evaluation of Operators and Senior Operators

13.2.2.2.1 Annual Requalification Examinations

Written requalification examinations will be given annually to all licensed operators and senior operators to determine areas in which retraining may be needed to maintain or upgrade licensed operator or senior operator knowledge. These examinations will be prepared, administered, and evaluated by the Grand Gulf Training Section, or by the NRC at their direction. A minimum grade of 80 percent correct on any section may exempt an operator or senior operator from required attendance at requalification lectures pertinent to that section. Licensed individuals who are directly involved in the preparation and grading of the examination may be exempt from taking the examination.

13.2.2.2.2 Retraining Program Examinations

Written examinations will be given covering material presented in the retraining program. These examinations will provide one of/or the basis for evaluating operators' knowledge of systems, administrative requirements, and procedures, and will be prepared and evaluated by members of the Grand Gulf Training Section.

A grade of less than 80 percent correct on any lecture series examination shall require an operator or senior operator to be rescheduled for lectures on that subject the next time such lectures are scheduled.

13.2.2.2.3 Practical Operator Performance Evaluation

Annually, the performance of licensed operators and senior operators will be evaluated and documented by supervisors and/or training staff members. An oral examination will be administered at least once during each 2-year qualification period to operators, senior operators, and senior operators limited to fuel handling and will include evaluation of actions taken or to be taken during actual or simulated off-normal and emergency conditions.

This oral examination may constitute one of or be in addition to the annual practical operator performance examination. The Grand Gulf control room may be used to accomplish the simulation

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of these conditions, or an appropriate simulator may be used to meet this requirement.

When the Grand Gulf control room facilities are used for these simulations, the action taken or to be taken for the conditions under simulation will be discussed. If an appropriate simulator is used, the simulator will reproduce the operating characteristics of GGNS. The instrumentation and controls of the simulator used will closely parallel those of the GGNS.

13.2.2.2.4 Accelerated Regualification Program

An accelerated regualification program will be provided for those individuals who do not perform satisfactorily on their annual regualification examination. Any operator or senior operator who receives an average grade of less than 80 percent overall and/or less than 70 percent in any area on an annual written regualification examination will be relieved of all duties requiring the use of his license and will participate in an accelerated regualification program. An operator who is relieved of his licensed duties will be so advised by station management. He may return to his licensed duties following attainment of an average grade of 80 percent overall and greater than 70 percent in all areas on a written qualification examination of the same format as the annual regualification examination.

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Training provided to operators or senior operators participating in an accelerated regualification program may include preplanned lectures, self study, on-the-job instruction, or other training as required.

13.2.2.2.5 Regualification Exams' Formats

There will be three separate regualification exams administered as follows:

Reactor Operator - This exam will be administered to holders of NRC Reactor Operator Licenses and will contain questions in the following categories:

1. Principles of Reactor Operation

This category contains questions relating to basic nuclear reactor behavior, elementary nuclear reactor theory, technical terminology, and an appreciation of processes taking place in a reactor.

2. Features of Facility Design

This category contains questions about the design features of the Grand Gulf facility, with emphasis on the reactor and auxiliary systems. It also

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inquires into design intent and the more important design parameters.

3. General Operating Characteristics

This category contains questions on controlled and variable parameters of the reactor and auxiliary systems. Values which are expressed as normal or operating parameters (e.g., flow rates, temperatures, tank levels) or values which are measured as resultant characteristics (e.g., temperature coefficient, reactivity worth, pressure drop) are investigated in this category. Questions relating to the manner in which power, reactivity, rod worths, or other parameters of this facility would change in response to manipulations, heatup, core burnup, or other stimuli are also in this category. Further included are questions relating to the traces that one would see on recorders, with emphasis on facility behavior rather than instrument characteristics.

4. Instruments and Controls

This category contains questions on the characteristics and interrelationships of the nuclear and process instrumentation and control systems. These questions will inquire into the principles of operation of detectors, location and settings of instruments, diagrammatic representation of instrument and control systems, and details of control rod drives' design and operation.

5. Safety and Emergency Systems

This category contains questions on the design, construction, operation, and interrelationships of the systems most directly associated with reactor safety, such as scram and other power reduction systems, pressure relief, suppression and containment, poison systems, spray systems, emergency power systems, and annunciated malfunctions.

6. Standard and Emergency Operating Procedures

This category contains questions on the procedures for the operation of the reactor and auxiliary systems including administrative controls. Operating restrictions in the facility license may be included herein to the extent that they are directly applicable to an operator.

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7. Radiation Control and Safety

This category contains questions on terminology, radiation hazards, radiological safety practices and fixed and portable radiation monitoring equipment.

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8. Principles of Heat Transfer and Fluid Mechanics

This category contains questions on heat transfer by conduction, convection, and radiation. Questions relating to heat transfer characteristics of fuel and heat exchangers are included. Natural and forced circulation heat transfer as well as boiling heat transfer are also included. Critical heat flux, critical power, heat transfer limits on the fuel and reactor systems may also appear as questions.

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9. Mitigation of Accidents Involving a Degraded Core

This category contains questions on the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. Questions relating to the use of in-core neutron monitoring instrumentation, post-accident coolant chemistry, radiation monitoring, and hydrogen generation and control are included.

Senior Reactor Operator - This exam will be administered to holders of NRC Senior Reactor Operator Licenses and will contain questions in the following categories:

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10. Reactor Theory

This category contains questions on principles of reactor theory including details of the fission process, neutron multiplication, source and control rod effects, and criticality indications. It has more advanced content than the operator Category 1, but is not advanced to the level of a nuclear physicist or engineer. Further, this category may contain questions, as applicable to the facility, concerning some aspects of basic reactor engineering, e.g., heat transfer and fluid flow which affect the safety of the reactor core and vessel.

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11. Radioactive Material Handling, Disposal, and Hazards

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This category contains questions on radiation hazards which may arise during operations or the performance of experiments, shielding alterations, or maintenance activities. Close familiarity with the provisions of 10 CFR Part 20 and supplementary facility regulations is required as well as a good

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common sense approach to radiological safety situations. Questions may include calculations involving inverse square law, decay rates, half-value thicknesses, and conversions of measured radiation intensities to rem, as well as other calculations of a similar nature.

Also included are questions relating to procedures and equipment (processing and monitoring) available for handling and disposal of radioactive materials and effluents.

12. Specific Operating Characteristics

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This category contains questions on specific operating characteristics of the reactor and auxiliary systems including nuclear, hydraulic, thermal, pneumatic, electrical, and coolant chemistry. Questions regarding quantitative as well as qualitative explanations of causes, limitations, effects, and consequences of changes are included.

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13. Fuel Handling and Core Parameters

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This category contains questions regarding fuel, fuel handling and core loading including procedures and limitations concerning core loading and alterations, fuel transfer and storage, and detection and prevention of criticality. Questions relating to fuel element characteristics and limitations include consideration of reactivity worths, burnup, hot spots, rupture detection, effects of boiling, and programming.

14. Administrative Procedures, Conditions, and Limitations

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This category contains questions on administrative, procedural, and regulatory items which affect operation of the facility.

15. Principles of Fluids and Thermodynamics

This category contains questions on the basic properties of fluids, fluid statics, and fluid dynamics. Questions relating to heat transfer and thermodynamics are also included.

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16. Mitigation of Accidents Involving a Degraded Core

This category contains questions on the use of installed plant systems to control or mitigate an accident in which the core is severely damaged. Questions relating to the use of in-core neutron

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monitoring instrumentation, post-accident coolant chemistry, radiation monitoring, and hydrogen generation and control are included.

13.2.2.3 STA Regualification Program

Annually all STA's will be given additional training in transient and accident analysis as noted in the FSAR. This training will be conducted by lectures and simulator training. To ensure that STA's are aware of significant industry events they will participate, on a continuing basis, in the required reading program.

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13.2.2.4 Retraining Records

Records of the regualification program will be maintained to document each licensed operator's and senior operator's participation in the regualification program. These records will contain:

1. Copies of written examinations administered
2. Answers given by the licensee to written examinations
3. Results of performance evaluations
4. Documentation of additional training administered to operators and senior operators in areas where deficiencies have been demonstrated
5. Records of attendance at preplanned lectures
6. Documentation of operator's and senior operator's cognizance of changes made to station design, appropriate procedures, and the station license
7. Documentation of operator's and senior operator's review of off-normal and emergency procedures
8. Documentation of operator's and senior operator's participation in reactivity control manipulations

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The Training and Administrative Superintendent is responsible for the maintenance of records pertaining to the regualification program.

13.2.3 Replacement Training

The purpose of the GGNS replacement training program is to ensure that replacement personnel satisfy the training requirements stipulated in ANSI N18.1-1971 and as stated in the NRC letter dated September 5, 1980, TMI Action Plan Requirements for the various plant positions.

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13.2.3.1 Licensed Personnel Replacement

Personnel who have satisfactorily completed a reactor operator selection program and who are designated as "in training" for a reactor operator's or senior operator's license will be given formal technical training and practical on-the-job training.

13.2.3.1.1 Replacement Personnel Technical Training

Formal technical training for reactor operator license candidates will be given in the following areas:

1. Principles of reactor operation
2. Design features of GGNS
3. General operating characteristics of GGNS
4. Instrument and control systems
5. Safety and emergency systems
6. Normal and emergency operating procedures
7. Radiation control and safety provisions
8. Heat transfer, fluid flow, and thermodynamics
9. The use of installed plant systems to control or mitigate an accident in which the core is severely damaged. (Shift technical advisors and operating personnel from the plant manager through the operations organization to the licensed operators will receive this training.)
10. Reactor and plant transients

In addition to the above areas, formal technical training for senior reactor operator license candidates will be given in the following areas:

11. Reactor theory
12. Handling and disposal of, and hazards associated with, radioactive materials
13. Specific operating characteristics of GGNS
14. Fuel handling and core parameters
15. Administrative procedures, conditions, and limitations

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Reactor Operator and Senior Reactor Operator candidates who have not had previous nuclear training or operating experience at a reactor facility, as outlined in ANSI 18.1-1971, Section 5.2.1, and the NRC letter dated September 5, 1980, TMI action plan requirements, will receive formal technical training in the following areas:

1. Basic Nuclear - 16 to 20 weeks - equivalent to Basic Nuclear conducted for initial training
2. A Grand Gulf Technology Course (5 weeks) similar to the course given for the initial operators
3. Completion of specified on-the-job evolutions. The on-the-job training will consist of at least 6 months on shift.
4. License Study Time - 3 to 4 weeks - supervised study program prior to license examination

13.2.3.1.2 Replacement Personnel Practical Reactor Operation Training

Comprehensive, practical, on-the-job training for reactor operator and senior reactor operator candidates will include the following areas:

1. Performance of at least two reactor startups conducted at GGNS prior to the demonstrative portion of the license examination under the direction of appropriate licensed personnel, followed by a startup of the reactor as part of the operating test; or
2. Manipulation of the controls of the GGNS reactor facility during five significant reactivity changes, as described in subsection 13.2.2.1.2, which may or may not include reactor startups. NOTE: The BWR-6 simulator may be used to satisfy these requirements if the plant is not available.
3. Instruction on the appropriate day-to-day station administrative activities and procedures. Receipt of such instruction will be documented in the trainee's training folder; and
4. A thorough self-study program under the guidance of more experienced station personnel to facilitate the candidate's knowledge and understanding of plant operating characteristics and station operating and emergency procedures. A minimum of 4 weeks will be designated for the self-study program. Completion of the self-study program will be documented in the trainee's training folder.

5. Senior reactor operator candidates will have 3 months of shift training as an extra man on shift.
6. Reactor operator candidates will have 3 months training on shift as an extra person in the control room.

13.2.3.2 Deleted

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13.2.3.3 Nonlicensed Personnel Replacement

Personnel filling positions not requiring an NRC operator's or senior operator's license shall meet the requirements stipulated in subsection 13.1.3 and will receive training as outlined in subsection 13.2.1.2.

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13.2.3.4 Program Administration

The program will be administered by the Training Superintendent.

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13.2.4 Fire Brigade Training

13.2.4.1 Instruction for Members of the Fire Brigade

Prior to assignment to a fire brigade, personnel shall receive instruction in the following topics:

1. Identification of fire hazards (and their location) and associated types of fires that occur in the plant.
2. Deleted
3. Identification and location of installed and portable firefighting equipment in the plant.

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4. Familiarization with plant layout including access and egress routes for each area.
5. Proper use of installed and portable firefighting equipment including the station fire truck.
6. Correct methods of fighting various types of fires. This shall include electrical fires, fires in cables and cable trays, hydrogen fires, flammable liquids, waste/debris fires, and record file fires.
7. Indoctrination in the Fire Protection Plan and Implementing Instructions. This shall include individual and fire brigade responsibilities.
8. Proper use of breathing, communication, lighting, and portable ventilation equipment.
9. Detailed review of fire protection plan implementation instruction, with particular emphasis on equipment to be used in particular areas.
10. Review of modifications, changes, etc., to the physical plant, procedures, firefighting equipment, or Fire Protection Plan.
11. Methods of fighting fires inside buildings and tunnels.
12. Deleted
13. Deleted
14. The toxic and corrosive characteristics of expected products of combustion.

In addition to the above topics, fire brigade leaders and the Station Fire Chief shall receive training in directing and coordinating firefighting activities.

Refresher training in the above topics will be conducted annually. The refresher training will be scheduled by the Training Coordinator for each fire brigade member. The sessions will be conducted quarterly and will be repeated every year.

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13.2.4.2 Practice for Fire Brigades

Annually, each fire brigade member shall practice the proper method for extinguishing the various types of fires. Actual fires shall be extinguished except that energized electrical fires may be simulated.

Each fire brigade member shall also practice techniques that require the use of protective breathing equipment. These practice sessions may or may not involve actual firefighting and shall be conducted annually.

13.2.4.3 Fire Brigade Drills

Fire brigade drills shall be performed to promote effective teamwork on the fire brigade. Various types of drills include, but are not limited to, the following:

1. Simulated use of equipment for various situations and types of fires which could reasonably occur in various areas of the plant. These simulations shall stress conformance to proper procedures and established firefighting plans.
2. Actual operation of fire protection equipment where practical. This includes breathing, communication, portable lighting, and ventilation equipment.

Fire brigade drills will be conducted using the following guidelines:

1. Each fire brigade shall be drilled at least semi-annually.
2. Each fire brigade member should participate in each drill. Each fire brigade member shall participate in two drills per year, as a minimum.
3. One drill per year for each fire brigade shall be unannounced. Each unannounced drill shall be separated by a minimum of 4 weeks.
4. One drill per year will be conducted on a backshift for each fire brigade.
5. All drills will be preplanned to meet established training objectives and shall be critiqued to determine the effectiveness in meeting these objectives.
6. Unannounced drills shall be preplanned, and a drill critique shall be held by a board of responsible management personnel.

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7. Performance deficiencies of fire brigades or individual fire brigade members will be corrected by providing additional training for noted weak areas.
8. An unsatisfactory drill performance by a fire brigade will be corrected by providing additional training for noted weak areas. A repeat drill will be held within 30 days of the critique.
9. At least once every 3 years a randomly selected unannounced drill shall be monitored and critiqued by a group of qualified individuals who are independent of the GGNS staff.
10. Each fire brigade drill shall be evaluated on the following, as a minimum:
 - a. Assessment of fire alarm effectiveness.
 - b. The time required to notify and assemble the fire brigade.
 - c. The selection, placement, and use of equipment and firefighting strategies.
 - d. An assessment of each fire brigade member's knowledge in the firefighting strategy and techniques for the fire area.
 - e. An assessment of the brigade's conformance to established plant firefighting procedures and use of the firefighting equipment, including self-contained breathing equipment, communication equipment, and ventilation equipment when applicable.
 - f. Assessment of the fire brigade leader's effectiveness in directing the brigade's activities.

13.2.4.4 Instruction for all Station Employees

Each permanent plant employee shall receive an indoctrination on the Fire Protection Plan evacuation routes from his normal place of duty, and procedures for reporting fires.

In addition, security personnel shall receive instruction that addresses entry procedures for offsite fire departments, crowd control for persons exiting the station, and procedures for reporting fires during their tours of the station.

Temporary personnel should be instructed in evacuation signals, evacuation routes, and fire reporting procedures.

13.2.4.5 Drills

An annual evacuation drill will be conducted.

13.2.4.6 Special Fire Protection Training

The station fire chief and his assistants shall receive training in:

1. Design and operation of fire detection, suppression, and extinguishing systems
2. Fire prevention techniques and procedures
3. Firefighting techniques and procedures for plant personnel and the fire brigades

Training for offsite fire departments will be in accordance with Section 13.3, subsection 8.2.3.

Training for construction personnel shall include reporting instructions, alarm responses, and evacuation routes.

13.2.4.7 Program Administration

Instruction in the above topics will be coordinated by the Training Superintendent. The instructor assigned will be knowledgeable on the topics and experienced in fighting the types of fires that could occur in the plant. He shall also be qualified to operate the fire protection equipment installed in GGNS. Generally, fire brigade leaders will be used for this instruction.

The Training Superintendent shall be responsible for scheduling, conducting, and documenting the fire brigade drills. He shall prepare drill scenarios for all drills.

13.2.5 Training Records

Records of plant personnel qualifications will be maintained on each member of the plant staff. Each member of the plant staff will have a qualification and training folder maintained by the Training Superintendent. The training folder contains a resume of the person's qualifications, records of training programs, training courses completed, lectures attended, and drill participation.

In addition, these records will contain, for licensed personnel and license candidates, results of written or oral examinations or both; results of retraining examinations administered

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in areas of previously noted deficiencies; and documentation acknowledging review of facility license changes, and changes to safety-related procedures.

All records and evaluations listed above will be used to judge the effectiveness of the training, retraining, and replacement training programs. The responsible member of the plant supervisory staff will periodically review in detail each individual's progress in the plant training program. The plant supervisory staff will also periodically review the overall training program to determine how well the program is supplying and maintaining qualified personnel to operate the plant.

13.2.6 Documentation

Adequate records will be maintained in accordance with 10 CFR 55 to document the participation of all licensed personnel in the initial training and requalification programs.

13.2.7 References

GGNS will follow the references listed in Regulatory Guide 1.70 with the exceptions of Regulatory Guide 1.8 and 8.8 regarding the Radiation Protection Manager. See Sections 12.1 and 12.5 and Appendix 3A for further details.

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FIGURE 13.2-1 IS DELETED

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Successful completion of the Plant Operation and Casualty Response Training Course requires a passing grade of 80 percent on all written examinations.

13.2.1.1.5.3 In-Plant Training

Each license candidate shall spend a period of time on shift in a training status under the direct supervision and guidance of the licensed control room operator. The objective of this training period is for each candidate to gain experience in the routine operation of a nuclear power plant.

- a. Prior to initial criticality, candidates not holding or having held an NRC License or having qualified in the Navy Nuclear Power Program shall spend at least 4 weeks at an operating BWR (should be at or above 20 percent power) observing the day-to-day operation of the plant. The candidates shall be under the direct supervision and guidance of an individual who is qualified in accordance with 10 CFR 55.9 (b). Each candidate should complete a checklist detailing those operations/evolutions to be performed, simulated, observed, and/or discussed. This checklist contains specific requirements in such areas as:

1. Plant operation from the control room
2. Local control and operation of equipment
3. Surveillance testing
4. System valve and electrical lineups
5. System component operation (i.e., pump startup and shutdown)
6. System interactions and indication

Each checklist requirement is signed off by the qualified individual observing and supervising the candidate as the requirement is being accomplished.

The license candidate shall also gain experience in the operation of the Grand Gulf Nuclear Station through participation in plant operating procedure preparation and verification and/or pre-operational testing of plant systems. In addition, each candidate is provided with a control room operator qualification card which contains knowledge factors and practical factors to be accomplished/discussed

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failure), iodines and cesiums (which indicate high fuel temperatures), and nonvolatile isotopes (which indicate fuel melting). The initial reactor coolant spectrum should correspond to a Regulatory Guide 1.3 or 1.4 release. The review should also consider the effects of direct radiation from piping and components in the auxiliary building and possible contamination and direct radiation from airborne effluents. If the review indicates that the analyses required cannot be performed in a prompt manner with existing equipment, then design modifications or equipment procurement shall be undertaken to meet the criteria.

In addition to the radiological analyses, certain chemical analyses are necessary for monitoring reactor conditions. Procedures shall be provided to perform boron and chloride chemical analyses assuming a highly radioactive initial sample (Regulatory Guide 1.3 or 1.4 source term). Both analyses shall be capable of being completed promptly (i.e., the boron sample analyses within an hour, and the chloride sample analysis within a shift).

RESPONSE

The capability to obtain and perform radioisotopic and chemical analyses of the reactor coolant and the containment atmosphere samples is provided by the Process Sampling System via the Post-Accident Sampling Station, which is described in subsections 7.7.1.11.4.2 and 9.3.2.2.4.

18.1.22 Training for Mitigating Core Damage (II.B.4)

REQUIREMENT

Licensees are required to develop a training program to teach the use of installed equipment and systems to control or mitigate accidents in which the core is severely damaged. They must then implement the training program.

RESPONSE

Mississippi Power & Light Company will utilize a degraded core training course provided by an outside source; this is not yet fully developed. This course will be given to all shift technical advisors and operations personnel, from the Plant Manager to and including licensed operators, prior to fuel load.

Managers and technicians in instrumentation and controls, health physics, and chemistry will be given training commensurate with their responsibilities during accidents which involve severe core damage.

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PQDR No.

DOCNO

00007-83

SHT

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INITIATOR

Potential Safety Related Deficiency: FSAR Section 13.2.1.1.5.3 and Administrative procedure 01-S-04-1 Rev. 2 para 6.2.5.d. requires that a Control Room Operator Qualification Card be completed during the on-shift training period for each license candidate. There is no documentation in training records that Operator Qualification Cards have been completed.

<input checked="" type="checkbox"/> QA RECORD
PI = F2.09
NON QA RECORD
GEN INITIALS
NO. OF DEF. 5
Hand Carry to: 9-883
RELATED DOCUMENT
NUMBER = N/A

ORIG/DATE

Name/Title

Date

Hand Carry to: Plant Quality or Operations Shift Supervisor (Backshift or Holidays)

PLANT QUALITY SECTION

Initial Evaluation:

	YES	NO	Evaluated by:	<u>Bowser</u>	<u>1/12/83</u>
(1) Safety Related	<input checked="" type="checkbox"/>	<input type="checkbox"/>			Date
(2) Potential 10CFR50.55(e)	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Concurrence:	<u>Emilia Hays</u>	<u>1-12-83</u>
(3) Potential 10CFR21	<input type="checkbox"/>	<input checked="" type="checkbox"/>			Plant Quality Superintendent/Date
(4) Action Required	<input checked="" type="checkbox"/>	<input type="checkbox"/>			

Action Required:

	Yes	No		Yes	No
(1) Technical Section Notified	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Evaluation Requested	<input type="checkbox"/>	<input checked="" type="checkbox"/>
(2) Disposition Action Required From:					
() Nuclear Plant Manager			<input checked="" type="checkbox"/> Other	<u>TRAINING SUPT.</u>	
() Site Manager					
() Manager Q.A.					

Required Corrective Action Completion Date:

2/23/83

TECHNICAL SECTION

- (1) MPL QAP 16.20/16.30 Initiated Yes () No ☒
- (2) PRD No. Assigned: N/A
- (3) Evaluation Check Sheet Must Be Attached.

PARTY RESPONSIBLE FOR DISPOSITION

Disposition:

Assigned to:
(If Desired)

RCVR

- (1) Cause: Control Room Cards were not completed by all Cold License Candidates, therefore, no entries have been made to that effect. A letter entry form was made (see attached) and sent to each Cold License Candidate that the card applied.
- (2) Disposition: A new training instruction book was issued that specifies the method of completing the cards, and also promulgates a check sheet that must be completed prior to the license exam.

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MEMO TO: File

FROM: D. L. Hunt, Training Superintendent

SUBJECT: Licensed Operator Qualification Cards-- Shared

IPC: 83/1448

Background: In January, 1983 during a review of training records by the Training Staff, it was noted that documentation of completed qualification cards as required by Administrative Procedure 01-S-04-1 were not available in training records for all licensed operators.

At this time a Plant Quality Deficiency Report (PQDR) number 00007-83 was written to document this deficiency.

Actions: During February and March, a thorough review of all licensed operators training records was conducted to determine the extent of missing and/or incomplete qualification card documentation. A representative of the Quality Assurance organization assisted the Training Staff in accomplishing this review. The review indicated that of 28 licensed personnel only 10 qualification cards were documented in training records.

Further review of this problem indicated the following:

1. The qualification card program was not a structured program in that neither the Training Staff nor the Operations Staff had established a method to ensure the qualification cards were completed. The lack of structured implementation was further compounded by the large volume of the qual card itself and the availability of qualified personnel to conduct system checkouts and walkdowns.
2. Completion of the qual cards was inadvertently left off the check list used by the training staff to check that all training requirements have been met prior to submitting license exam applications to the NRC.

Permanent Corrective Action:

1. No further action is intended regarding completion of qualification cards for current licensed personnel. The Training Staff has determined that the first two license classes (cold) should be exempt from the qual card completion requirement since no one was currently licensed and thus qualified to sign off the cards. It was further determined that the remaining licensed operators although they did not meet the requirement of qual card completion, should be exempt from a retroactive sign off since their knowledge level has been verified by the NRC in the form of successful completion of NRC exams and issuance of licenses. A copy of this memo will be filed in training records for those personnel who did not complete their qual cards or cases where documentation cannot be located to verify completion.

2. The qualification card is being reviewed for effectiveness and will be revised as necessary to ensure the qual card is a meaningful training tool.
3. Future license candidates will be required to complete the qual card prior to sitting for an NRC license exam.
4. The FSAR will be revised to clarify when the qual card must be completed and Administrative Procedure 01-S-04-1 revised accordingly.
5. Qual card completion will be added to the check list used by the training staff as a requirement for submitting a license application.
6. The Training and Operations Staff will ensure that qualified personnel are made available to the trainees for checkouts.


D. L. Hunt

DLH/CRH:jsh

cc: Roy Keeton
C. K. McCoy
Individual Training Record
(per Attachment I)
Training File
IPC File
Plant File
File

ATTACHMENT I to IPC: 83/1448

List of Licensed Personnel that are exempt from completion of Qualification Cards

W. Bearden
K. Benefield
C. Bottemiller
L. Byrd, Jr.
M. Dorsett
K. Ehrhardt
E. Hall
C. Hicks
S. Humphries
R. Keeton
B. Lewis
O G. Lhamon
G. McMillin
J. Robertson
W. Russell
W. Shelly
C. Stafford
L. Moulder

PLANT QUALITY DEFICIENCY REPORT
(PQDR)

RT F2.09

PQDR No.

DOCNO

00008-83

SHT / of

INITIATOR

Potential Safety Related Deficiency: Procedure 01-S-04-1 Revision 0 11/14/80 and FSAR Chap. 13 Section 13.2.1.1.1 requires that SRO's have instruction on Procedures and Basis. Documentation that this instruction has been performed for licensed SRO's is not available in training records. Additionally, later revisions of 01-S-04-1 deleted the requirement to have instruction on Procedures and Basis (apparently in error).

ORIG/DATE

1-11-82

Name/Title

Date

Hand Carry to: Plant Quality or Operations Shift Supervisor (Backshift or Holidays)

PLANT QUALITY SECTION

Initial Evaluation:

YES NO

Evaluated by:

Bowser

1/12/83

(1) Safety Related

☒

()

(2) Potential 10CFR50.55(e)

()

☒

Concurrence:

Ente Hagan

1-12-83

(3) Potential 10CFR21

()

☒

Plant Quality Superintendent/Date

(4) Action Required

☒

()

Action Required:

Yes

No

Yes

No

(1) Technical Section Notified ()

☒ Evaluation Requested ()

(2) Disposition Action Required From:

() Nuclear Plant Manager

() Site Manager

() Manager Q.A.

Other TRAINING SUPT

Required Corrective Action Completion Date:

2/23/83

TECHNICAL SECTION

(1) MPL QAP 16.20/16.30 Initiated Yes () No ()

(2) PRD No. Assigned:

(3) Evaluation Check Sheet Must Be Attached.

PARTY RESPONSIBLE FOR DISPOSITION

Disposition:

Assigned to:
(If Desired)

RCVR

(1) Cause:

Procedure is poorly written in that it appears that there is a specific course called Procedures and Basis. Procedures and Basis are taught as part of the Plant Operations and Casualty Response Course and Administrative Requirements Course. Procedures, Tech. Spec and Basis are also taught during Grand Gulf Technology.

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PLANT QUALITY DEFICIENCY REPORT
(CONTINUED)

PQDR NO.

DOCNO

00008-83

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Disposition Continued:

- (2) Corrective Action Required including that to prevent recurrence:

Amendment to FSAR has been submitted to reflect the actual course titles, procedures and bases as a subject area as part of other courses. ^{Rev. 3} The change to 07-5-04-1 will show the applicable course titles.

- (3) Corrective Action Has Been Completed.

Diff

7/22/83

Date

Supervisor or Manager Disposition
Action Assigned to or Designated
Party Responsible for Disposition

Note: After Completion, return to: Mississippi Power and Light Co., Plant Quality Section, GGNS, P. O. Box 756, Port Gibson, Ms. 39150

Disposition and Corrective Action Approval

Castle Hagen

8-22-83

Plant Quality Superintendent

Date

CKM

8/25/83

Nuclear Plant Manager/ Site Manager

Date

PLANT QUALITY SECTION

Corrective Action Verified and PQDR Closed Out:

(Quality Section)

Date

Verification Method:

PQDR # _____

Sheet _____ of _____

01-S-06-8

Rev. 2

Attachment II

Page 1 of 1

LICENSING DOCUMENT CHANGE REQUESTChange No. 83-16

Originator:

Date:

Subject Document:

References:

50.59 EVAL

SE-042/83

Attachments:

Please make the following change(s) to the subject document: change the4th paragraph of 13.2.1.1.1 as follows: Deletef. procedures and basesg. Plant Operation and Casualty ResponseCONCURRENCE:

Section Supervisor _____

Date _____

Licensing Engineer _____

Date _____

Comments:

Procedures and Basis is taught as part of the
Operator practices training discussed in section 13.2.1.1.5. This is
not a line item course. Plant Operation and Casualty Response
is taught to all operators in Operator practices training.
This course is taught at the SRO level. A specific course
for SRO candidates only is not taught.

In addition to the above, senior licensed operator candidates receive additional training in the areas of:

~~1. Procedures and Rules~~

~~2. Plant Operation and Casualty Response~~

h. Supervisory Skills

PQDR # _____

Sheet _____ of _____

13.2.1.1.2 Nuclear Fundamentals Training

All license candidates shall ^{have} received approximately 12 weeks of classroom training in the science and engineering subjects listed below:

- a. Mathematics
- b. Classical Physics
- c. Atomic and Nuclear Physics
- d. Reactor Theory
- e. Chemistry
- f. Heat Transfer, Thermodynamics, and Fluid Flow
- g. Plant Materials
- h. Radiation Detection
- i. Radiation Protection
- j. Basic Electronics and Electricity
- k. Instrumentation and Controls

During the fundamentals training phase, written examinations are given at the conclusion of each subject area. These examinations may be supplemented by written quizzes administered during the presentation of each subject.

13.2.1.1.3 Systems Operation Training (GRAND GULF Technology)

All license candidates shall ^{have} received approximately eight weeks of detailed classroom presentations covering each of the GGNS systems over which the licensed control room operator has control or cognizance. This training is designed such that upon completion, the student should be able to discuss the following topics for each of the plant systems:

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