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NUCLEAR PRODUCTION DEPARTMENT

April 21, 1982

U. S. Nuclear Regulatory Commission
Office of Nuclear Reactor Regulation
Washington, D. C. 20555

Attention: Mr. Harold R. Denton, Director

Dear Mr. Denton:

SUBJECT: Grand Gulf Nuclear Station
Units 1 and 2
Docket Nos. 50-416 and 50-417
File: 0260/0862
Proposed Revisions to FSAR Section 13.2
AECM-82/179



Attached are responses or clarifications pertaining to issues discussed in either the Grand Gulf Nuclear Station Safety Evaluation Report (SER), NUREG-0831, or the Final Safety Analysis Report (FSAR). The attachment provides proposed revisions to FSAR Section 13.2.

Regarding revisions to the Grand Gulf FSAR, the content of the last FSAR amendment prior to the projected fuel load has been submitted (Amendment 55, April 19, 1982). Thus, the incorporation of any proposed FSAR revisions, as discussed in the attachment, will be made pending the receipt of further guidance requested informally from the NRC in regard to post-operating license FSAR amendments.

If additional information is required, please advise.

Yours truly,

L. F. Dale
Manager of Nuclear Services

JGC/JDR:rg

Attachment

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AECM-82/179

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cc: Mr. N. L. Stampley (w/o)
Mr. R. B. McGehee (w/o)
Mr. T. B. Conner (w/o)
Mr. G. B. Taylor (w/o)

Mr. Richard C. DeYoung, Director (w/o)
Office of Inspection & Enforcement
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

Mr. J. P. O'Reilly, Regional Administrator (w/o)
Office of Inspection and Enforcement
U.S. Nuclear Regulatory Commission
Region II
101 Marietta St., N.W., Suite 3100
Atlanta, Georgia 30303

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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
- f. Heat Transfer and Fluid Flow
- g. Mitigation of Core Damage

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

- h. Procedures and Bases
- i. Plant Operation and Casualty Response
- j. Supervisory Skills

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

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- e. Chemistry
- f. Heat Trasfer, 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 may be given. All license candidates shall score at least 80 percent on all examinations in order to satisfactorily complete this phase of training.

Exceptions to the fundamental training phase may be granted for those candidates who a) have successfully completed the Memphis State Nuclear Reactor Fundamentals Course based on Memphis State's grading criteria at the time of course preparation, b) have previously completed the U.S. Naval Nuclear Power School programs, c) have completed other acceptable programs composed of college courses at accredited institutions, and d) have previously completed a BWR SRO certification at a General Electric certification/training facility.

13.2.1.1.3 Systems Operations Training

All license candidates shall receive approximately five to 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

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- 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 have participated 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:

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- 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)

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- 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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13.2.1.1.5.1 Administrative Requirements Training

Each license candidate shall have received approximately one 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. 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. Deleted
- j. Deleted
- k. Deleted
- l. Deleted

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 have received approximately two weeks of classroom training on the following subjects:

- a. Alarm response instructions, off-normal event procedures, emergency procedures, and emergency plan procedures
- b. Plant transients and trend analysis
- c. Recognition and mitigation of the consequences of core damage
- d. Site Emergency Plan
- e. Deleted

f. Deleted

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 meet the requirements of items a or b below. 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, not having qualified in the Navy Nuclear Power Program, or not having previous BWR or PWR operating 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).

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

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factors to be accomplished/discussed while in an on-shift training status.

- b. After initial plant criticality, each license candidate shall have spent 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 should attend a brief simulator refresher course. This training emphasizes overall plant operation during both normal and abnormal situations.

During the course of this training phase, each license candidate will be 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 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 or satisfactorily pass an oral examination 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 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

13.2.1.1.7.2 Supervisory Training

Each senior license candidate receives at least one 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 10 to 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.

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.

A brief simulator refresher training course, typically one to two weeks, should be scheduled for all license candidates at a BWR-6 simulator prior to the licensing examination.

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 Regualification 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

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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13.2.1.1.15 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.

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.

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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.

Licensed operators on each shift should:

- a. See at least one pressure controller transient (ST122)
- b. Operate the RCIC (ST114)
- c. Operate the recirculation flow control system (ST129)

Other testing will be balanced as much as practicable to ensure even exposure to testing for all operating shifts.

13.2.1.1.16 Diesel Engine Training for Licensed and Non-Licensed Operators

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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

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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

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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 will be 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

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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 lectures integrated with laboratory work and is approximately five weeks long. Individuals experienced in nuclear instrumentation startup and design provide the instruction for this course. Selected technicians and engineers have completed this course.

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13.2.1.2.3 Station Nuclear Engineering

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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 and consists of lectures and studies covering the following topics: process computer, BUCLE, 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.

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13.2.1.2.4 BWR Chemistry

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This 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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The station chemist has completed this course.

13.2.1.2.5 Process Instrumentation and Control

This 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 instrumentation startup and design instructors. Selected I&C technicians and engineers have completed this course.

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13.2.1.2.6 Radiological Engineering

This course 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 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 troubleshooting 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
3. Airborne radioactivity control

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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)

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

a. Plant Systems

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

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, BUCLE, 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

This 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.

d. Administrative Controls

The administrative controls segment consists of a detailed presentation of the Grand Gulf Nuclear Station Administrative Procedures that pertain to the

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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

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

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.

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g. STA Simulator Training

This 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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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 an annual 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
6. Training personnel who are licensed are exempt from the provisions of the regualification program for the area in which they have primary administrative responsibility. For example, an individual who prepares, administers, and/or grades a written examination need not take the examination.

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

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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. Principles of Nuclear Power Plant Operation
2. Fundamentals of Thermodynamics, Heat Transfer, and Fluid Flow
3. Plant Design Including Safety and Emergency Systems

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4. Instruments and Control
5. Procedures - Normal, Abnormal, Emergency, and Radiological Control
6. Theory of Nuclear Power Plant Operation
7. Theory of Fluids and Thermodynamics
8. Plant Systems: Design, Control, and Instrumentation
9. Administrative Procedures, Conditions, and Limitations
10. Deleted
11. Deleted
12. Deleted
13. Deleted
14. Deleted

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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

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- e. Loss-of-coolant forced flow/natural recirculation
- f. Loss of all feedwater (normal and emergency)

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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.

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

The examinations will be 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 Nuclear Power Plant 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. Fundamentals of Thermodynamics, Heat Transfer, and Fluid Flow

This category contains questions on hydraulics and fluid flow fundamentals, heat transfer and heat

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generation fundamentals, fundamentals of thermodynamics, and simple calculational problems showing understanding in this area.

3. Plant Design, Including Safety and Emergency Systems

This category contains questions about the design features of the particular facility, with emphasis on those systems that are designed to maintain and protect against the uncontrolled release of radioactive materials.

4. Instruments and Controls

This category contains questions on the characteristics and interrelationship of the nuclear, process, and radiological instrumentation and facility control systems.

5. Procedures - Normal, Abnormal, Emergency, and Radiological Control

This category contains questions on the knowledge and use of facility procedures, including normal, abnormal, emergency, administrative, and radiological control procedures.

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

6. Theory of Nuclear Power Plant Operation

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.

7. Theory of Fluids and Thermodynamics

This category contains questions on understanding heat and energy cycles involved with nuclear power plant operations, heat transfer processes involved with reactor core cooling, reactor thermal limits, identification of plant parameters which can be used to quantify plant heat generation, and heat transfer information.

8. Plant Systems: Design, Control, and Instrumentation

This category contains questions about the design features of GGNS with emphasis on those systems which are

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designed to maintain and protect against the uncontrolled release of radioactive materials. It further contains questions on the characteristics and interrelationships of the nuclear, process, and radiological instrumentation and control systems.

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9. Procedures - Normal, Abnormal, Emergency, and Radiological Control

This category contains questions on the procedures for the operation of the reactor and auxiliary systems, including administrative controls, technical specifications, and radiation hazards which may arise during performance of maintenance activities.

10. Administrative Procedures, Conditions, and Limitations

This category contains questions on administrative, procedural, and regulatory items which affect operation of the facility. Included are questions on design and operating considerations and limitations as specified in the facility license, such as technical specifications, the procedures required to obtain authority for design changes, procedures regarding formation and approval of operating procedures, the authority to approve deviations from operating procedures on either a permanent or temporary basis, and emergency situations as they affect the entire plant's operation or security.

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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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staff will have a qualification and training folder maintained by the Training and Administrative Superintendent. The training folder contains records of training programs, training courses completed, lectures attended, and drill participation.

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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 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.

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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.

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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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