



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION II  
101 MARIETTA STREET, N.W.  
ATLANTA, GEORGIA 30323

Report No.: 50-416/86-13

Licensee: Mississippi Power and Light Company  
Jackson, MS 39205

Docket No.: 50-416

License No.: NPF-29

Facility Name: Grand Gulf

Inspection Conducted: May 5-9, 1986

Inspectors: <u>D. P. Falconer</u>	<u>6-23-86</u>
D. P. Falconer	Date Signed
<u>J. Arildsen</u>	<u>6-23-86</u>
J. Arildsen	Date Signed
<u>P. Moore</u>	<u>6-23-86</u>
P. Moore	Date Signed
Approved by: <u>Bruce A. Wilson</u>	<u>6/23/86</u>
B. A. Wilson, Acting Section Chief Operational Programs Section Division of Reactor Safety	Date Signed

SUMMARY

Scope: This routine, announced inspection involved the areas of licensed operator and non-licensed staff training programs.

Results: No violations or deviations were identified.

8607100385 860626  
PDR ADOCK 05000416  
Q PDR

## REPORT DETAILS

### 1. Persons Contacted

#### Licensee Employees

- \*J. E. Cross, Site Director
- \*C. R. Hutchinson, General Manager
- \*R. C. Fron, Manager, Plant Support
- \*W. E. Edge, Manager, Nuclear Site, QA
- \*S. M. Feith, QA Director
- \*F. W. Titus, Nuclear Plant Engineering Director
- J. L. Robertson, Operations Superintendent
- \*K. E. Beatty, Training Superintendent
- \*L. F. Daughtery, Compliance Superintendent
- \*M. Shelly, Operations Training Supervisor (Acting)
- \*P. L. Hayes, Accreditation Coordinator
- \*J. D. Bailey, Compliance Coordinator

Other licensee employees contacted included engineers, technicians, operators, mechanics, training instructors, and office personnel.

#### NRC Resident Inspectors

- \*R. Butcher
- \*J. Caldwell

\*Attended exit interview

### 2. Exit Interview

The inspection scope and findings were summarized on May 9, 1986, with those persons indicated in paragraph 1 above. The inspectors described the areas inspected and discussed in detail the inspection findings. No dissenting comments were received from the licensee. The licensee did not identify as proprietary any of the materials provided to or reviewed by the inspectors during this inspection.

### 3. Licensee Action on Previous Enforcement Matters

This subject was not addressed in the inspection.

### 4. Unresolved Items

Unresolved items were not identified during the inspection.

## 5. Grand Gulf Training Program

The inspection team conducted an evaluation of the effectiveness of the licensed operator and non-licensed staff training programs. The inspection methodology involved a review of plant operating history to select, when possible, abnormal events or unusual occurrences for which training deficiencies appeared to have been a contributing factor. Once identified, plant personnel involved were selected for interviews and/or training record reviews to determine training program effectiveness. The inspection team evaluated selected portions of the following training programs:

- a. Licensed Operator and Senior Operator
- b. Shift Technical Advisor
- c. Non-licensed Operator
- d. Maintenance
- e. General Employee
- f. Plant Engineer
- g. Health Physics Technician

In general, training showed improvement with an overall commitment of sufficient utility resources and management support to provide an effective training organization. The available training facilities enhanced the learning process and the delivery of training. Comprehensive quality assurance audits of plant training programs were conducted periodically. Audit findings were promptly corrected by the training organization.

The licensee was aggressively pursuing INPO accreditation of major plant training programs. The licensed operator, licensed senior operator and non-licensed operator training programs received accreditation on April 30, 1986. The final self-evaluation reports for the maintenance (I&C, Electrical, and Mechanical), STA, chemistry technician, HP technician, technical staff and management training programs have been submitted.

## 6. Licensed Operator and Senior Operator Training and Requalification Training

The inspectors evaluated the licensed operator and senior operator training and requalification training programs. Interviews and/or training record reviews of operators involved in the following plant events were conducted:

- a. LER 416/86-01: On January 1, 1986, the reactor automatically scrambled due to low reactor water level when an operator raised the turbine steam pressure demand setpoint to 600 psig during a plant startup causing feedwater flow to decrease. The reactor water level recorder continued to indicate a normal level due to a stuck recorder pen and the operator continued to withdraw control rods until an Automatic Depressurization System (ADS) level 3 confirmation signal annunciated. At this time, the operator realized that the level indication on the recorder was wrong, but had no time to take corrective action to prevent the scram. Other water level instrumentation was operable and indicated actual level during the event, but was not used by the operator.

- b. LER 416/85-19: On June 4, 1985, during a plant shutdown, reactor pressure dropped to 75 psig prior to removal of one filter and pump resulting in a differential flow isolation due to a loss of suction pressure to both RWCU pumps. One RWCU filter and pump is normally removed from service at 100 psig.
- c. LER 416/85-02: On January 29, 1985, the Heater Drain Pump was being placed in the pump forward mode when the N23-F054 valve (heater drain pump discharge to the feed pump suction header) could not be opened. A change in system lineup was established to decrease differential pressure across the valve in an attempt to crack the valve open. This resulted in F054 going full open which diverted condensate supply to the reactor feed pumps back to the hotwell. A reactor low level scram occurred following feed pump trips on low suction pressure.
- d. LER 416/85-41: On October 31, 1985, Operations personnel discovered that the operability of the alternate method of decay heat removal had not been demonstrated within a 24-hour period as required by Action (a) of Technical Specification 3.4.9.2.

#### Initial Licensed Operator Training

The Licensed Operator Training Program currently provides initial and upgrade training for three licensed operator positions at Grand Gulf: control room operator, shift supervisor, and shift superintendent. These training programs are implemented by administrative procedure (AP) 01-S-04-1, Rev. 8, Licensed Operator Training and Qualifications Program. AP 01-S-04-1 specifies training curricula and the requirements for attendance, examinations, appeals, evaluations, etc. and appears to provide adequate administrative control.

The inspectors reviewed selected licensed operator lesson plans and determined that, for the most part, the lesson plans were developed pursuant to established instructional system development (ISD) criteria. The inspectors noted that the following licensed operator lesson plans had not been revised to the ISD format:

- a. OP-G18-501, Revision 0 - Solid Radwaste
- b. OP-AA-513, Revision 0 - FSAR - Fuel Handling Accident Inside Containment
- c. OP-DT-524, Revision 0 - Technical Specification Bases Part 5

The licensee stated that a commitment was made to INPO to complete the revision of all licensed operator lesson plans to the ISD format prior to their next use. In addition to the above concerns, the inspectors noted that lesson plans OP-P71-501, Revision 1 - Plant Chilled Water System and OP-C34-501, Revision 1 - Feedwater Control System contained diagrams which were illegible. The licensee stated that an effort was underway to upgrade

lesson plan diagrams. The revision of the above lesson plans to the ISD format and the improvement of lesson plan diagram quality will be an inspector followup item (416/86-13-01).

The inspectors monitored a portion of a licensed operator lecture on the feedwater control system. The instructor was well prepared, commanded the topic and utilized good podium techniques. He was responsive to student questions and maintained a professional atmosphere conducive to the learning process.

The inspectors verified that selected licensed operator and senior operators involved in the events described above successfully completed an initial licensed operator training program. Selected NRC Form 398 applications were reviewed to verify that information submitted to the NRC accurately portrayed the candidates training and experience. The inspectors reviewed lecture and simulator attendance records, module examinations and audit examinations to ensure that the selected operators adequately participated in required training.

#### Licensed Operator Requalification Training

Administrative Procedure (AP) 01-S-04-2, Revision 4, Licensed Operator Requalification Training specifies the requalification training requirements for licensed reactor operators and senior reactor operators. AP 01-S-04-2 requires that six preplanned lectures covering specified topic areas be planned each year. The procedure also provides the requirements for control manipulations, operational feedback, procedure review, examination and accelerated requalification. A review of the 1985 Licensed Operator Requalification Schedule indicated that the licensee had provided the required retraining pursuant to AP 01-S-04-2 during the 1985 requalification year.

The inspector audited a portion of a simulator requalification session. The use of two simulator instructors enhanced the quality of instruction. The session was conducted in a professional manner and an atmosphere similar to that in the actual control room was maintained throughout the scenario. The instructors utilized formal scenario lesson plans with established learning objectives. Approved and controlled procedures and drawings were available in the simulator. An adequate feedback process was in place to update both simulator software and hardware with adequate resources allocated to ensure timely revisions and upgrades.

Feedback of operating events, design changes, procedure changes, etc. for revision to lesson plans and training materials is an established process which results in up-to-date instruction under the cognizance of the training organization. Immediate training needs, however, once identified are normally handled by the operations department exclusive of the training organization. These needs include procedure revisions, technical specification changes, abnormal operating configurations, design changes, etc. The method by which operations identifies an immediate training need and implements this need is not encompassed by an administrative procedure. The

inspectors consider that formalization of this process with input and/or continued involvement by the training organization is necessary to ensure that all immediate training needs are effectively met. This item will be identified as an inspector followup item. (416/86-13-06)

A review of the 1985 annual reactor operator and senior reactor operator requalification examinations indicated that the examinations were of sufficient difficulty to challenge the licensed operators and to provide an adequate evaluation of operator knowledge. The average examination results for the 19 senior reactor operators administered the 1985 annual requalification examination was 86.2 percent. The average for the 18 reactor operators was 83.6 percent.

A review of 1985 licensed operator requalification training records revealed that a licensed senior reactor operator (SRO) who was involved in event d above failed to attend Module 2 (Simulator) and Module 4 (Theory) of the 1985 requalification curriculum. Furthermore, the SRO was not provided makeup training or examinations in the requalification topics missed. The SRO also failed to achieve a passing grade of 80 percent on Module 3 (Procedures and Technical Specifications) and was not provided remedial training and reexamination in the Module 3 subject area. The SRO subsequently failed the 1985 annual requalification examination with a score of 73.6 percent. He was removed from shift duties and placed in an accelerated requalification program. After approximately two weeks of accelerated requalification, the SRO was reexamined, achieving a passing score of 95.8 percent.

An expanded review of module examination grades and attendance records revealed only one other licensed reactor operator who had achieved less than 80 percent on the Module 3 examination, however, he was not provided remedial training or administered a reexamination.

A review of the AP 01-S-04-2 requirements for remedial and makeup training and examinations indicated that the above licensed operators met the approved requirements; however, the inspectors consider that these requirements are inadequate to ensure proper requalification attendance or prompt remedial training and reexamination. Although the inspectors determined that the SRO's non-participation in a significant portion of the 1985 requalification curriculum did not directly contribute to the identified event, it did impact his overall knowledge in the required subject areas as supported by the fact that he subsequently failed the 1985 annual requalification examination.

To correct the identified deficiencies in attendance and remedial training, the licensee drafted AP 01-S-04-2 with revised attendance and remedial training requirements. The implementation of improved procedural requirements for attendance and remedial training for the licensed operator requalification program will be an inspector followup item (416/86-13-03).

## 7. Shift Technical Advisor (STA) Training and Requalification

The Shift Technical Advisor (STA) program is established for selected plant engineering personnel to provide advanced technical assistance to the operating shift complement during normal and abnormal conditions. The STA training and requalification program is established in Grand Gulf Administrative Procedure 01-S-04-7, Revision 5.

The inspectors reviewed the training records of all qualified STAs, interviewed selected STAs, reviewed procedures and commitments associated with STA qualification and requalification, and observed an STA training lecture.

The results of the personnel interviews, records review, and procedure review indicates that the initial STA training and requalification program is conducted in accordance with the licensee's committed programs.

During the observation of an STA classroom lecture on Natural Circulation, Depressurization Transients and Fuel Clad Quenching, the inspector noted that the instructor was not adequately prepared for the instructional topic. Lecture flow was erratic and at times, the instructor appeared to be unfamiliar with the lesson plan. The instructor did not fully understand the basis for certain information contained in his lesson plan, and as a result, his response to student questions often contributed to their confusion. The inspector noted, however, that the instructor was recently injured in an automobile accident which significantly reduced his class preparation time.

STAs participate with their respective shifts in licensed operator simulator requalification. This practice is noteworthy; however, a substantial increase in training benefit could be achieved if the simulator lesson scenarios included specific lesson instructions and learning objectives for the STA position. Presently, these scenarios are developed for operator tasks and, in most cases, do not effectively address the STA position. Simulator evaluation forms are also not tailored for effective evaluation of the STA position.

## 8. Non-Licensed Operator Training

Non-licensed operator training records were randomly selected for NRC inspector review. Those training records examined were found adequate in format and content. Recent filing changes permitted one of the training records selected to be maintained in two separate folders. The responsible licensee staff personnel considered this a poor filing practice and resolved this particular file. The inspector considers that a check for additional dual filing would be prudent.

Three non-licensed operators were interviewed in regard to the adequacy of various areas of non-licensed operator training including such areas as OJT, formal classroom training, operational feedback to the training program,

accuracy of the training records, and training in direct response to recent generic events. One Auxiliary Operator Nuclear (AON) interviewed was unaware of an AON related Grand Gulf Unit 1 event which had occurred two months prior to the inspection interview; but had noted the related procedural change that had been implemented. In general, the non-licensed operator interviews reflected an effective non-licensed operator training program in the areas addressed.

The inspector review of the criteria utilized for selection of entry level personnel for the non-licensed operator training program found the criteria adequate. Direct management attention was being utilized in the selection of non-licensed operators for license training and for evaluation of student problems and failures. This was being conducted through management, periodic screening of potential candidates for the licensed operator training program and student progress reviews. The Operations Superintendent ensured the review of candidate's resumes and training records and personally interviewed the students prior to their selection to commence licensed operator training.

The non-licensed operator requalification training program was reviewed by the NRC inspector and found adequate. Recently, procedures established in conjunction with Institute for Nuclear Power Operations (INPO) accreditation (April 30, 1986) provided an improved comprehensive, systematic requalification program which, if properly implemented as scheduled, should result in effective requalification training. NRC inspector review of examination question security determined that non-licensed operator examination questions and materials were being properly handled under procedural control with locked paper files and limited access coded computer files.

#### 9. Maintenance Training

NRC inspector review of maintenance personnel training records was conducted through the selection of three plant events involving maintenance personnel errors and the review of the training records of the maintenance personnel associated with the events. Maintenance training records reviewed were found complete and in compliance with Plant Operations Manual training section procedures.

Two of the three maintenance technicians, an electrician and an instrument and control (I&C) technician, were interviewed by the inspector. The interviews' topics included: the technicians' resume and training records, the technical aspects of their associated event, previous and post-event training received by the technicians in that area, the technicians' perception of the maintenance training program, the technicians' recollection of specific event feedback items noted to have been included in recent

maintenance training and the technicians' understanding of requalification responsibilities and requirements. No significant maintenance training deficiencies were noted from the interviews.

It was noted from NRC inspector's maintenance personnel record review that maintenance technicians from all three disciplines, mechanical, electrical, and I&C, had not received documented surveillance program training in approximately three years. In light of the surveillance related events of the past three years, the inspector questioned maintenance training staff instructors in this regard. Through a recent change, the mechanical, electrical, and I&C requalification training programs, now specifically include surveillance program training as a module in the scheduled curriculum.

The NRC inspector conducted a review of selected portions of the Electrical Continuing Training lesson plans and I&C lesson plans, "Math and Basic Electronics" and "Solid State and Electrical Circuits". The lesson plans and portions of lesson plans reviewed were newly revised and undergoing initial presentation and were found adequate in content and format. Additionally, a review of mechanical maintenance lesson plans, "Blue Print Reading, Revision 0" and "Hilti Concrete Expansion Anchor Certification, Revision 2", was conducted. The multiple choice section of examination #1 of the "Blue Print Reading" course had "both" b. and d. listed as the answer key's correct answer to question #6. There should only be one correct answer. The inspector noted that this course has been rewritten; the generation of new examination questions and answers was in progress; and that this particular examination was not intended for further use. NRC inspector review of the lesson plan for the "Hilti Concrete Expansion Anchor Certification" course identified a minor error in a diagram of the anchor. The lesson plan, including diagrams, is currently under revision, and the inspector discussed this issue with the licensee staff member assigned to this curricula's revision. A 20-question course examination is administered from a question bank of 31. The NRC inspector reviewed the five examinations currently on file and observed 80% or greater repetition of questions in the comparison of any two of the examinations. The course instructor was aware of the excessive repetition of examination questions and was in the process of developing a more extensive question bank.

The present feedback mechanism effectively provides for mechanical maintenance training curricula update and development; however, update and development was noted to have been severely hampered by the poor feedback of generic events and facility events pertinent to mechanical maintenance personnel training prior to early 1986. This resulted in current course information failing to address many of the events of the past three years. Updating information has recently been provided to the appropriate curricula developer and is being incorporated into the courses.

The NRC inspector observed the noteworthy fruits of extensive effort by the maintenance training staff in the procurement and construction of various training aids and training laboratory equipment. The NRC inspector noted a

very positive attitude toward the continuing development of maintenance training courses displayed by all the maintenance training instructors contacted.

#### 10. General Employee Training (GET)

NRC inspector review of ten selected personnel training records spanning operators, maintenance personnel, and management showed systematic periodic General Employee Training (GET) attendance.

NRC inspector observation of classroom instruction and administration of written examinations found the GET program adequate in these areas. It was noted that several of the GET lessons were presented by video tape, and that ample classroom instructor time was provided for a "question and answer" period and instructor enhancement of the video tape presentations. Many significant changes in GET training materials were in progress which included several of the video tape presentations being under revision. The inspector reviewed three video taped presentations and provided verbal comments for consideration in the video tape revisions. The examination administration observed was noted to comply with Grand Gulf Nuclear Station Plant Operations Manual, Revision 14, Examinations, 14-S-01-4 and Examination Implementation 14-S-02-4; and adequate security measures to prevent the compromise of examination materials were observed.

Management was noted to have placed particular emphasis on senior personnel GET attendance, and a computer-based system for tracking required GET is in use. One GET instructor was interviewed and was considered adequate with respect to technical and training background.

#### 11. Health Physics

NRC inspector review of the continuing health physics training program revealed that effective training was being accomplished and documented by the operations department and not the training department. The current training program does not have a structured schedule of training topics. It was also noted that many recent HP related events were being addressed by shift lectures, yet no program was witnessed that would ensure that all applicable recent HP events and issues would be covered.

#### 12. Engineering Training

Grand Gulf employs 41 people in Engineering positions. The inspector reviewed all of the engineers' resumes and/or employee applications. All but two engineers had bachelor degrees in an applicable engineering or science field. Of the two that did not, one had substantial college studies without a degree. The other had considerable expertise as an electrician, and high praise from his supervisor and coworkers indicating that his recent promotion to an engineering position was warranted. The licensee is committed to ANSI 18.1-1971 for training and qualification of plant employees. This standard requires bachelor of science in engineering or physical science for reactor engineers only. GGNS engineering personnel have a high level of

qualifications that exceeds those required by the ANSI standard.

The training program for engineers requires the retention of records for the engineers which includes an individual log for each engineer that details the dates and types of training as well as an indication of satisfactory completion. The individual training records for all of the engineers were, for the most part, satisfactory. There was some inconsistency between different personnel as far as the degree of retention of hard copy of exams, certificates, resumes, or applications. All of the files had an up-to-date log of training. Approximately, 25% of the files had a GGNS form indicating that a highest level of educational degree verification had been performed.

In addition, the inspector also reviewed the qualifications and training of the Site Director, Manager Plant Operation, and Manager Plant Support. All of their qualifications and training records were adequate.

### 13. Training Section Document Review

The inspector reviewed the licensee's Training Section Document Review program. This program enacts a "review of design change documents, operating experience documents, procedure changes, and other applicable information for incorporation into training programs and required reading programs." Pertinent information, such as LERs, design changes, and IE information notices is received by the training department. It is then reviewed for routing to the appropriate training department where the supervisor will then determine whether or not the material is appropriate to training in their section.

The system appears to be very well organized and beneficial. There are data bases of both open and closed items that include a tracking number, revision type, a brief description, estimated closing date, and from where the information was obtained. Interviews with various training department supervisors were very positive and demonstrated a satisfactory level of participation and interaction in the system.

The inspector reviewed past LERs and IE Notices independently to select documents that should have been reviewed for action within the training department. The inspector chose one LER and two IE Notices. LER 86-001 concerned a failed level recorder contributing to an operational error causing a reactor scram. Investigation revealed that this had been incorporated as a simulator scenario for all licensed operators.

IE Notice 85-86 detailed a number of events where lightning strikes had indirectly caused several reactors to trip. The inspector found this IE Notice referenced as part of an open item with an estimated completion date of June 16, 1986.

IE Notice 85-87 discussed several instances demonstrating the hazards of inerting atmospheres. While this Notice was not referenced anywhere in the document review system, an INPO document that was similar in nature and referenced some of the same occurrences was used. This item is presently

being tracked with an estimated completion date of June 16, 1986.

The training section document review system was computerized in February 1986. It appears to be accomplishing its purposes expeditiously.

#### 14. Followup Items

- a. IFI 50-416/85-14-03: Expressed concern about the licensed operator training and requalification records being destroyed after being microfilmed. Records were placed in disk storage by class, not trainee, making it difficult to assemble an individuals' complete training file. NRC requested that the original records of license and licensee requalification training be retained for at least two years.

Procedure No. 01-S-04-14, Training Records, Rev. 11, dated December 31, 1985, Section 6.14.3 now states:

License Operator Requalification Records will be maintained for a period of two years at which time, with microfilm or Hard Copy Location Number determined and logged, they may also be destroyed.

This action is adequate to close IFI 50-416/85-14-03.

- b. IFI 50-416/85-14-04: Procedure 01-S-04-2 requires only that an individual achieving less than 80% on a requalification lecture series examination be rescheduled the next time that a lecture series on that particular subject is scheduled. A failed examination on a specific area which was just taught indicates a definite deficiency. Remedial training and retesting to ensure that this deficiency is resolved should be completed within a reasonable period of time, instead of allowing the deficiency to exist for a year or more until the lecture series is repeated. This remedial training and retest requirement should be procedurally defined.

Procedure 01-S-04-2 has been extensively rewritten to address this concern (Revision 5). The inspector feels that implementation of Revision 5 of procedure 01-S-04-2 procedure clearly defines a satisfactory retraining program for operators exhibiting possible deficiencies in their abilities. IFI 50-416/85-14-04 will be closed. IFI 50-416/86-13-03 tracks implementation.

- c. IFI 50-416/85-14-05: Procedure 14-S-01-04 on test controls does not require that examinations be reviewed and approved prior to administration, or to receive a second review after completion and grading. The review prior to administration, helps to ensure that the questions are valid and complete and that the point values assigned are reasonable. This review has apparently been informally conducted by the licensee, but not procedurally required. The review of the completed tests and grading, help to ensure that the grading was reasonable and that the grades were properly totalled.

Procedure 14-S-01-04 now requires review of examinations prior to administration. The review of completed tests and grading, other than that by the students, to ensure that non-conservative errors in point totalling, etc., will only be required for the NRC audit examinations and the annual requalification examination. The inspectors find this satisfactory which closes IFI 50-416/85-14-05.