



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

Report No.: 50-416/92-06

Licensee: Entergy Operations, Inc.
 Jackson, MS 39205

Docket No.: 50-416

License No.: NPF-29

Facility Name: Grand Gulf

Inspection Conducted: February 24-28, 1992

Inspector: G. R. Wiseman 2/12/92
 G. R. Wiseman Date Signed
Paul J. Fillion 3/12/92
 P. J. Fillion Date Signed

Accompanying Personnel: J. T. Munday

Approved by: Frank Jape 3/12/92
 Frank Jape, Chief Date Signed
 Test Programs Section
 Engineering Branch
 Division of Reactor Safety

SUMMARY

Scope:

This was an announced Postfire Safe Shutdown Capability Reverification and Assessment (IP 64150) and a review of the licensee's Fire Protection Program (IP 64704) as approved in the NRC Safety Evaluation related to Amendment No. 82 to Operating License No. NPF-29, dated August 23, 1991. The inspection verified that the licensee has completed and maintained the postfire safe shutdown capability following the initial Appendix R validation inspection previously conducted in 1985 at the Grand Gulf Nuclear Station (GGNS) (Inspection Report Nos. 50-416/85-16, dated August 29, 1985). The inspection covered areas as they relate to plant fire protection and Appendix R postfire safe shutdown capability including: (1) Isolation capability of Remote and Alternate Shutdown Panels from the Main Control Room and cable separations of the electrical distribution systems required for remote and alternate shutdown operations; (2) reverification of Appendix R fire protection features; (3) review of postfire safe shutdown procedures and equipment; and (4) review of the GGNS fire protection program.

Results:

During this inspection, the NRC inspectors discussed the plant Fire Protection Program (including the remote safe shutdown systems configuration) history with the licensee's plant staff. The licensee's responses to these discussions and the results of this assessment indicate that Entergy Operations Inc. has resolved previous technical Appendix R issues. In general, the licensee's Fire Protection Program as it relates to maintaining Appendix R compliance and postfire safe shutdown capability was found to be adequate with several strong features.

- The Fire Protection and Engineering Technical Support Staffs at the plant appear to clearly understand the technical requirements for maintaining the Fire Protection Program.
- The licensee's technical expertise in the areas of maintaining Appendix R compliance appears strong. This is evident based on the quality of the Fire Hazards Analysis Cable Summaries and Color-Coded Raceway Plans for Fire Protection Exposure of Safe Shutdown Related Cables used for conducting Appendix R reviews of plant design changes.
- Plant management is actively pursuing programs which should ensure long-term Appendix R compliance and maintain the postfire remote safe shutdown capability. This is evident based on the timely review and approval by the Plant Safety Review Committee of temporary changes to the Shutdown From the Remote Shutdown Panel procedure to address the NRC inspectors' procedural concerns. No significant program weaknesses were identified in the licensee's Fire Protection Program related to maintaining postfire safe shutdown capability; however, plant management was challenged to pursue the conduct of periodic/operation-shift drill training in the implementation of the Remote Shutdown Off-Normal Event and Emergency Operations Procedure to ensure adequate procedural flow, operator communications, and emergency plan coordination.
- Implementation of the fire protection program at the Grand Gulf Nuclear Station was good. This is evidenced by the good control of combustibles, cleanliness of the plant, low number of fire events on record, and effective fire brigade training and drills.

Based upon the satisfactory results of this inspection, a detailed 10 CFR 50 Appendix R compliance reverification inspection for GGNS is not warranted at this time.

REPORT DETAILS

1. Persons Contacted

Licensee Employees

- *A. Barfield, Engineering Supervisor
- *T. Barnett, Engineering Supervisor, Electrical
- *W. Cottle, Vice President, Operations
- *L. Daughtery, Licensing Supervisor
- *M. Dietrich, Director, Quality
- *C. Ellsaesser, Operations Superintendent
- *B. Ford, Engineer, Nuclear Safety and Regulatory Affairs
 - K. Fortenberry, Senior Reactor Operator
- *V. Holmberg, Fire Protection Coordinator, Operations
 - S. Humphries, Senior Reactor Operator
- *R. Hutchinson, General Manager
 - J. Jackson, Field Engineering
- *A. Kharifar, Principal Electrical Engineer
 - M. McDowel, Operations Assistant, Senior Reactor Operator
- *M. Meisner, Director, Nuclear Safety and Regulatory Affairs
- *D. Pace, Director, Design Engineering
- *J. Reaves, Manager Quality Services
- *E. Roan, Fire Protection Engineer
 - C. Roberson, Supervisor, Training Requalification
 - R. Rose, System Engineer
- *R. Ruff, Licensing Specialist
- *T. Thornton, Electrical Engineer
 - D. Wiles, Engineering Supervisor, Electrical Projects

Other licensee employees contacted during this inspection included craftsmen, mechanics, security force members, technicians, and administrative personnel.

NRC Resident Inspectors

- J. Mathis, Senior Resident Inspector
- C. Hughey, Resident Inspector

*Attended exit interview

2. Remote Safe Shutdown Systems Configuration Review (IP64150)

a. Electric Power and Control

A portion of the inspection was devoted to a review of the isolation features (switches) that were installed to protect the control circuits to allow functioning of the safe shutdown (SSD) equipment

during an exposure fire in the control room (Fire Area 50). The isolation switches were installed at the first plant refueling outage in order to bring the plant into conformance with 10 CFR 50 Appendix R requirements. About 57 isolation switches (or relays) were installed for this purpose at various plant locations. About 40 switches were located near the remote shutdown panels in two panels (1H22-P152 and 1-H22-P299) others were installed in three panels (1H22-P295, 1H22-P296, and 1H22-P298) in the auxiliary building and one panel (1H22-P400) near Diesel generator DG/11. The circuits were electrically arranged such that about 22 manual switching operations would be required to achieve complete control room isolation for the shutdown equipment controls. These panels were locked to ensure "deliberate operation" of the switches.

The inspection included the following specific activities:

- (1) A review of selected elementary diagrams for control circuits utilizing the control room isolation switches.
- (2) Confirming that all circuits requiring control room isolation switches actually had isolation switches.
- (3) Field inspection of selected fuses installed in the control circuits to confirm that they matched drawings with respect to size and that the remote shutdown fuses matched the normal operation fuses (original fuse) in type and size.
- (4) Confirmed that the isolation switches were break-before-make type switches. This was important because the isolation switches have both normally open and normally closed contacts. The normally closed contacts isolate the control room portion of the circuit; and the normally open contact energize the remote shutdown portion of the circuit. The switch must be break-before-make; otherwise, the remote shutdown fuse could blow upon operation of the switch.
- (5) A field walkdown of selected cable routings associated with the Automatic Depressurization System (ADS) Valves, and Residual Heat Removal (PHR) remote safe shutdown systems to verify they had not been routed through the control room fire area.
- (6) Confirmed that all normally de-energized remote shutdown circuits were covered by a surveillance to help ensure their availability when needed.

b. Appendix R Features

Appendix R to 10 CFR 50 requires certain fire protection features to be provided for the separation of the redundant safe shutdown systems/components in the same fire area. These features include automatic suppression, automatic detection, fire barriers, radiant

energy shields and spacial separation. If a licensee proposes alternate methods of protecting the redundant systems/components, an exemption/exception from the applicable requirements of Appendix R must be requested.

During this inspection, the inspectors verified that the plant configurations as described in the NRC Safety Evaluation (SE) granting certain exceptions from the requirements of Appendix R had not changed significantly to affect the bases of the SE.

The inspectors reviewed the Appendix R Fire Protection features for the following plant fire areas to verify that the bases for the August 23, 1991, SE were still valid.

- Auxiliary Building, Elevation 199' - Fire Area 6, (SE Section 2.1.3)
- Auxiliary Building, Elevation 139' - Fire Area 11, (SE Section 2.1.4)
- Control Building, Elevations 133' and 148' - Fire Area 42, (SE Section 2.1.7)
- Control Building, Elevation 166' - Fire Area 50, (SE Section 2.1.8)
- Control Building, Elevation 111' - Fire Area 38, (SE Section 2.1.10)

Based on the above, the inspectors found that the remote safe shutdown and Appendix R fire protection features reviewed have been maintained in accordance with the approved configurations as described in the GGNS UFSAR and SER dated August 23, 1991.

c. Postfire Safe Shutdown Procedures

The inspectors reviewed operating personnel training, shift staffing and the licensee's use of off-normal event procedures and emergency operations procedures as these activities related to alternative shutdown activities. These areas were reviewed to determine if they met requirements established in the SER dated August 23, 1991. In addition, the adequacy of emergency lighting installed to illuminate operator access and egress paths and safe shutdown equipment was reverified.

(1) Personnel Training and Shift Staffing

The inspectors reviewed selected portions of the licensee's program for conducting training specifically in the area of Appendix R related remote SSD procedures needed to achieve cold SSD. It was noted that classroom training and field walkdowns

were given to the licensed and non-licensed operators whose files were randomly selected for review.

Based on a representative sample of licensed and non-licensed operator training records individual operator training appeared adequate.

The licensee's normal shift staffing was reviewed to verify that sufficient personnel were available to operate equipment and systems described in Procedure 05-1-02-II-1, Rev. 21, Shutdown from Remote Shutdown Panel. The shift personnel that provided support to 05-1-02-II-1 are separate from the operations personnel assigned to the fire brigade as delineated in Procedure, "Conduct of Operations". A one-week sample of shift staffing records was reviewed and appeared adequate.

(2) Procedures

The inspectors reviewed the licensee's off-normal procedures to verify that the SER, dated August 23, 1991, requirements had been incorporated into applicable procedures.

ONEP 05-1-02-II-1, Rev. 21, Shutdown from the Remote Shutdown Panel, ONEP 05-1-02-III-1, Rev. 17, Inadequate Decay Heat Removal, and ONEP 05-1-02-IV-4, Rev. 21, Loss of AC Power, were reviewed to determine the following requirements had been incorporated:

- Achieve and maintain cold shutdown conditions
- Provide decay heat removal capabilities
- Maintain reactor coolant inventory
- Provide direct readings of process variables necessary to control the above conditions.

In addition to reviewing the above procedures the inspectors conducted a field walkdown, accompanied by two licensed operators of ONEP 05-1-02-II-1, which is used to achieve cold shutdown conditions when operations cannot be conducted from the main control room. The procedure assumes all equipment in the control room required for a safety shutdown is affected and that the potential loss of offsite power may occur. The purpose of the walkthrough was to verify that:

- Identification plates were installed on safe shutdown equipment.
- Lighting at safe shutdown equipment as well as access and egress is adequate.

- Procedure steps are clear and can be accomplished.
- Instrumentation is available to monitor process variables needed to achieve cold shutdown conditions.

The walkthrough identified three concerns regarding use of Procedure 05-1-02-II-1, Rev. 1.

- (a) Potential for inadequate SSW flow to DGA, (step(B) 3.6)
- (b) Potential for isolating the suction path of RHR "A" while the pump is running. (Step(B) 3.284)
- (c) Potential for discharging flow from RHR "A" to the suppression pool and RPV simultaneously - (Step(B) 3.21)

Subsequent to the inspection, the licensee provided the NRC inspectors a copy of Temporary Change Notice, TCN No. 7, to Procedure 05-1-02-II-1, approved by the Grand Gulf PSRC on February 28, 1992. This change included procedural enhancements and "NOTE" additions which were reviewed in the NRC Region II office. These procedural enhancements clarify the procedure steps sufficiently to address the inspectors concerns.

With these enhancements the procedure and operator knowledge appear adequate to bring the plant to a cold shutdown condition from the remote shutdown panels. Therefore, no further NRC followup actions are considered for these items at this time.

(3) Emergency Lighting

The inspectors reviewed the adequacy of emergency lighting along operator access and egress paths and at the remote safe shutdown locations described in Procedure 05-1-2-02-II-1.

The adequacy of the lighting was verified by the field walkdown with operators as noted above. At each minimally required manual operation location, the inspectors verified that eight-hour emergency lighting was provided and it illuminated the required equipment.

During the inspection, it was noted that emergency lighting was not provided for all components listed in all procedural steps. The licensee identified that some procedural steps are for plant convenience and are not specifically required to achieve alternate shutdown. In this case, the operators are provided with portable handlights, which are located at the Remote Shutdown Panel (Appendix R locker) to perform these manual actions, if directed. The inspectors verified that these handlights were located inside the locker, were operable, and provided with spare batteries.

Additionally, the inspectors confirmed that the Appendix R emergency lighting units are covered by surveillance testing on a weekly and semiannually basis to assure continued operability of the batteries, detect battery degradation, and reverify unit head alignment.

Based on the above discussions, the inspectors found that the emergency lighting provided adequate illumination for the minimum required operator actions outlined in Procedure 05-1-02-II-1.

3. Fire Protection/Prevention Program (IP64704)

The inspectors evaluated the adequacy and implementation of selected portions of the licensee's fire protection program.

The licensee has incorporated the GGNS fire protection program, including Technical Specifications (TSs) into the UFSAR, Revision 5, by letter dated December 1, 1990, in accordance with NRC Generic Letter 88-12. The NRC issued Amendment No. 82 to the GGNS operating license on August 23, 1991, that consisted of the above changes to the TSs and issuance of Operating Licence Condition (OLC) 2.c (41) which references the NRC approved fire protection program and allows certain licensee changes to this program.

a. Fire Protection Organization

The GGNS Manager, Plant Operation has overall responsibility for the plant fire protection program. The Fire Protection Coordinator is responsible for implementation of the operations department responsibilities of the fire protection program and is the Plant Fire Chief. The Shift Superintendent is responsible for ensuring that each shift is manned with the necessary complement of trained fire brigade members.

b. Fire Brigade

The fire brigade is composed of six shifts of dedicated fire brigade personnel from the operations staff. The Shift Fire Chief is normally the Shift Superintendent. The inspectors reviewed the fire brigade assignments for the weeks of February 8, 1992 through February 21, 1992, and verified that fire brigade qualified personnel were assigned to operating shifts to meet the minimum fire brigade requirements of the fire protection program. A review of the training records for the fire brigade leaders and members indicated that the training for each of those assigned fire brigade members on duty were up to date and met the established site training requirements.

c. Fire Brigade Drills

The inspectors reviewed the shift drills for 1991 and verified that at least one fire drill had been conducted for each shift at intervals of 92 days and within the allowable extension accepted as discussed in Section 2.3 of the NRC SER dated August 23, 1991. In addition, the inspectors noted that a total of 32 drills had been conducted during the year. Of these, over one-half were conducted within safe shutdown areas of the plant and many within those fire areas with approved exceptions from Appendix R to 10 CFR Part 50. This is not a NRC commitment, but offers additional fire protection defense in depth and is considered a program enhancement.

d. Fire Reports

The inspectors reviewed plant fire reports required by plant procedure 10-S-03-5. Four reportable fires had occurred, three in 1991 and one, thus far in 1992. None of these fires occurred in safe shutdown plant areas. Each fire was in the incipient phase of burning and was immediately identified by plant personnel. Each of these fires was caused by an electrical short and either self-extinguished or was extinguished with portable extinguishing equipment (fire extinguisher). None of these fires was considered safety significant.

e. General Plant Inspection

The inspectors during plant walkdowns, observed safety related areas of the plant for general housekeeping, control of combustibles, work activities in progress, and the condition of fire protection systems and equipment. No welding, cutting, or use of open flame ignition sources were observed during NRC inspection tours in the plant. The inspectors observed positions of valves of fire protection water and carbon dioxide systems. The inspectors also assessed the compliance with the plant fire protection procedures; operability of interior hose stations, portable fire extinguishers, cable fire wraps, fire doors, penetration fire seals and fire barrier walls and floors. All discrepancies that were observed had already been identified and documented by the licensee. No concerns in these areas were identified.

5. Exit Interview

The inspection scope and results were summarized on February 28, 1992, with those persons indicated in paragraph 1. The inspectors described the areas inspected. Proprietary information is not contained in this report. Dissenting comments were not received from the licensee.