



ENTERGY

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August 13, 1992

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U.S. Nuclear Regulatory Commission  
Mail Station P1-137  
Washington, D.C.

Attention: Document Control Desk

Subject: Grand Gulf Nuclear Station  
Unit 1  
Docket No. 50-416  
License No. NPF-29  
Response to Violation for Failure to Follow Procedure  
Report No. 50-416/92-16, dated 07/17/92  
(GNRI-92/00152)

GNRO-92/00102

Gentlemen:

Entergy Operations, Inc. hereby submits the response to Notice of Violation 50-416/92-16-01.

We recognize that the performance of Grand Gulf is not up to our or your expectations in the areas of self-verification and attention to detail. Previous corrective actions primarily aimed at the individual employees have resulted in a reduction of the overall level of significance of personnel error when compared to historical events and have had other positive effects such as heightened awareness of shutdown risk. However, such actions have not been as effective as desired in lowering the rate of occurrence.

Consequently, in a letter to all site personnel I have communicated the seriousness of this situation and have emphasized my expectations concerning personal responsibility and accountability associated with attention to detail and self-verification. In addition, we have initiated actions intended to improve our level of supervisory performance and involvement in the oversight of safety-critical and trip-critical work.

- 1) We are placing additional controls on selected evolutions involving trip-critical and safety related systems which could impact plant reliability or result in undue safety system challenges. These controls will require that detailed briefings be held between engineering, maintenance, and operations personnel, as appropriate, prior to being performed to ensure all parties understand the activity, the expected results and the possible consequences.

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This same requirement will apply to scope changes on work in progress - the requesting individual will be required to brief control room personnel concerning the proposed changes and possible impacts.

A Shift SRO will oversee these briefings.

- 2) To increase management oversight of attention to detail, the first line discipline supervisors are required to be at the job location during performance of selected work on the trip critical and safety related system work as described above. A Shift SRO will perform this function if a first-line supervisor is not available for any reason.

Furthermore, GGNS management is concerned about our continuing susceptibility to lightning induced transients. We recognize that our previous corrective actions have not been effective in eliminating the cause of the condition, however, we have taken a number of positive steps to mitigate its effects. GGNS personnel are aggressively testing methods to eliminate the sensitivity of our neutron monitoring circuits to lightning strikes.

- 1) An integrated engineering group consisting of plant engineers, CHAR Engineering and General Electric personnel was assembled as a result of the November 1991 scram. This group provided corrective actions that were implemented prior to or during RF05, and were intended to perform the following functions:
  - a. Reduce the susceptibility of the APRM signal cables to high frequency noise.
  - b. Reduce the susceptibility of the APRM signal cables to low frequency noise. (i.e., filter chokes referenced in LER 92-010)\*
  - c. Reduce the susceptibility of the primary APRM power supply to noise transients.

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This recommendation could not be completed during RF05 because of problems identified during testing of this design. Subsequent bench tests have identified a better approach to reducing the susceptibility of the APRM system to low frequency noise. We have identified a path for a noise voltage to couple onto the APRM circuit through a set of diodes. The magnitude of this noise voltage is proportional to the size of a jumper internal to the APRM panels. Increasing the size of this jumper, to reduce the jumper's resistance, reduces the potential drop across this jumper and subsequently reduces the noise impressed on the APRM circuit. A design to increase the size of this jumper is scheduled to begin implementation during the week of August 8, 1992. Additionally, GGNS is currently evaluating the removal of these "coupling diodes" thus eliminating the path for this noise to couple onto the APRM circuit.

- d. Reduce potential noise environment in the APRM panels.
  - e. Reduce the potential for coupling of noise into the LPRM signal cables at the containment penetrations.
  - f. Reduce the potential for lightning striking unit 2.
  - g. Issued standing order to reduce power during lightning storms to reduce the potential for invalid safety system actuation during lightning storms.
- 2) In an attempt to identify the root cause for GGNS' susceptibility to lightning induced transients, recorders have been installed in the plant to help identify noise sources.
  - 3) GGNS has contracted with Failure Prevention, Inc. to support our effort in identifying the root cause for the susceptibility of the APRM system to lightning induced scrams.
  - 4) A weather monitoring system was installed to give control room personnel the ability to track storm fronts as they come in close proximity to the plant, enabling operations personnel to decrease and increase reactor power in a more timely and efficient manner.
  - 5) Feasibility studies have been initiated on the possibility of installing a time delay in the APRM upscale neutron trip circuit. There is a high potential for this type modification to reduce our susceptibility to lightning strike scrams due to the very short duration of circuitry spikes. This modification would require regulatory approval prior to implementation.

Grand Gulf will continue to aggressively pursue an acceptable solution to lightning induced transients.

Additionally, realizing that improvements are needed in management oversight and philosophy at GGNS, an extensive critical review of how problems are identified, corrected and trends established for trigger mechanisms has been initiated. Two such areas being critically reviewed are:

- o Root Cause Analysis
- o Corrective Action Program

Specific action items in these and other areas will be discussed during the August 17, 1992 meeting with Region II staff.

Grand Gulf management will continue to closely monitor the success of these efforts and make adjustments as necessary to achieve expected improvements. We are dedicated to making Grand Gulf a world class performer and appreciate your candid feedback.

Yours truly,

*W. F. Cote*

WTC/RR/cg  
attachment

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**Notice of Violation 92-16-01 Example 1**

Technical Specification 6.8.1.a requires that written procedures be established, implemented and maintained covering the applicable procedures recommended in Appendix "A" of Regulatory Guide 1.33, Revision 2. Regulatory Guide 1.33, Appendix A, recommends that procedures for performing maintenance which can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures and documented instructions. Administrative Procedure 01-S-07-1, Control of Work on Plant Equipment and Facilities, paragraph 6.1.2, requires, in part, that maintenance and repairs of safety-related equipment be performed in accordance with approved procedures or instructions. Work Order 57258 required the Division I load shedding and sequencing panel to be deenergized prior to maintenance.

Contrary to the above, on May 19, 1992, during the performance of Work Order 57258, a non-licensed operator mistakenly deenergized the Division II load shedding and sequencing (LSS) panel instead of the Division I panel.

**I. Admission or Denial of the Alleged Example 1 of Violation**

Entergy Operations, Inc. admits to this violation.

**II. The Reason for the Violation, if Admitted**

On May 19, 1992, a maintenance work order required the Unit 1 Division I LSS panel to be deenergized in accordance with approved written instructions. The 15 and 24 VDC power supplies were to be replaced during the maintenance. Plant maintenance personnel proceeded to the control room, received authorization from the operations shift supervisor and requested that an operator assist in the down-powering evolution. Maintenance personnel proceeded to the Unit 2 Division I LSS panel and waited for operations assistance.

The non-licensed operator entered the Unit 1 Division I LSS panel area and inquired about maintenance personnel performing the required maintenance on the LSS panel. The operator was informed that the maintenance technician was in the Unit 2 area. The operator talked to the technician and they proceeded to the Unit 1 area.

The operator and technician entered the Division II LSS area and reviewed the work order for instructions. The operator inquired about being at the proper panel and the technician responded in the affirmative. The operator also questioned the technician on the authorization of the work to be performed and was allowed to review the control room authorization on the work order.



However, the operator did not review the component number which was specified in the work order and in the work instructions. After reviewing the authorization, the operator proceeded to deenergize the Division II LSS panel.

The cause of the occurrence is inattention to the component number specified in the work order instructions and a lack of self-verification.

### III. Corrective Steps Which Have Been Taken and Results Achieved

The Operations Superintendent discussed the event with the operator involved and the appropriate operations staff.

The maintenance technician was removed from safety-related activities pending review of the incident

Maintenance management emphasized to department personnel the importance of equipment identification/tagging throughout the plant.

**Notice of Violation 92-16-01 Example 2**

Maintenance Procedure 07-S-14-368, Clean and Inspect Boll and Kirch Type 161 or 2.62 multimantle filter assemblies, step 7.1.2, required the maintenance staff to detention a top vent plug on the main turbine Electro-Hydraulic Control (EHC) System Filter flange to verify that the filter housing was isolated from EHC system pressure prior to removing the filter flange cover to replace the filter.

Contrary to the above, on June 18, 1992, a maintenance worker did not perform step 7.1.2 of procedure 07-S-14-368 to verify isolation from the EHC before detentioning the stud nuts on the filter flange. This resulted in a large EHC oil leak which depressurized the EHC system, causing a reactor scram.

**IV. Admission or Denial of the Alleged Example 2 of Violation**

Entergy Operations, Inc. admits to this violation.

**V. The Reason for the Violation, if Admitted**

On June 17, 1992 a maintenance work order (WO) was generated to change and clean EHC filter N32D009. The task was not attempted until the 2330 hour mechanical shift reported to work.

In preparation for the task, the mechanics went to the filter assembly to familiarize themselves with the task. In their observation, they noticed that the vent plug for the filter was damaged and the corners of the hex head were severely rounded off. The condition is assumed to have been caused by the use of improper wrenches on the hex head. The mechanics returned to the maintenance shop and obtained the required tools for the filter change-out.

The non-licensed Turbine Building operator was requested to remove the north filter from service and place the south filter in service (this is accomplished by one manual actuator which operates two three-way valves simultaneously). The operator operated the valves; then the mechanics verified the appropriate filter had been isolated by placing their hands on the two filters and comparing the temperature difference. The south filter was relatively hot and the north was warm, but not at ambient temperature.

The mechanics proceeded to vent the filter in order to relieve any residual pressure. During the venting process, EHC fluid continuously drained out of the filter prior to securing the vent plug. It was concluded that the filter was still pressurized and additional efforts to isolate the filter would be necessary to perform the task.

The operator initiated a condition identification (CI) to document the three-way valve leaking by its seat. However, the operator did not inform control room personnel.

On June 18, 1992, the mechanics informed the incoming maintenance specialist of the status of task and difficulties experienced by operations in isolating the filter. The mechanics also informed the oncoming mechanical supervisor of difficulties in isolating the filter. The uncompleted work package was turned over to the oncoming 0730 hour mechanical shift. A discussion of the filter cleaning was performed in the work control group morning meeting; however, the relationship between the WO for the filter and the CI for the leaking valve was not fully communicated.

The maintenance specialist who accepted the turnover from the 2330 hour mechanics informed the oncoming mechanical shift supervisor of the urgency of the task performance and difficulties experienced during the first attempt to perform the task.

The mechanics were informed of the difficulties and requested to identify possible alternative methods of isolating the north filter. Following a review of the system diagrams, it was determined that there was no other way to isolate the filter other than the three-way valve.

The mechanics proceeded to the filter assembly and met a different non-licensed operator in the filter area. The mechanics inquired about difficulties with isolating the filter on the previous shift. However, this operator did not know the details of the difficulties encountered during the first attempt. Mechanics also inquired about the need to change the filter. The control room was called and conveyed that the filter needed to be changed. No further inquiries were made to identify details surrounding the first filter change attempt. The operator verified the filter was isolated by local indications and informed the mechanics that the filter was isolated.

Therefore, mechanics felt confident that the filter was isolated and only residual pressure would exist in the filter housing. Mechanics attempted to remove the vent plug, but were unsuccessful in loosening the plug. The procedure governing the activity required the vent to be loosened prior to the removal of the filter cover. Without consulting their supervisor, the mechanics decided to loosen the cover nuts to relieve any residual pressure in the filter housing.

This was a violation of procedure. Upon loosening the cover, the filter O-ring blew out as a result of the internal pressure due to the leaking three-way valve.



Large quantities of EHC fluid were lost due to the displacement of the O-ring. The loss of fluid caused a low reservoir level and subsequent control fluid pressure decrease. Following the control fluid pressure decrease, the main turbine stop and control valve partially closed causing vessel voids to collapse and neutron flux to increase which resulted in a high flux condition and subsequent signal to RPS.

Mechanics involved with the second attempt to change the filter did not have the procedure available at the filter assembly. The procedure required the vent plug to be loosened and removed prior to loosening the filter cover. An attempt was made to remove the vent plug, however, it was unsuccessful due to the hex head corners being rounded.

This step would have verified that the filter was not properly isolated. This step was not performed before proceeding to the next procedural step. This deviation from procedure was not authorized by maintenance management.

Following no negative responses on inquiries of difficulties with the first filter change-out attempt, mechanics were confident that the filter was isolated and felt that no adverse consequences would result from loosening the filter cover. The mindset that the filter was isolated prompted the mechanic to bypass the step which would have verified the filter isolated.

The non-licensed operator generated CIs on problems identified during the attempt to isolate and change the filter. Control room personnel and operation shift management were not made aware of the identified problems therefore, the control room had no knowledge of the actual conditions. This is identified as a causal factor to the event.

The operator logged the attempt and results of the attempt in the building log book. Also, the operator discussed the details of the condition with the oncoming Turbine Building operator. However, a different operator was assigned to assist the mechanics and did not have detailed knowledge of the problems encountered during the previous shift. This is identified as a contributing factor.

The mechanics involved during the previous shift performed a turnover to the oncoming maintenance specialist and mechanical supervisor. The details of problems with the filter were not discussed. This is identified as a causal factor.

Investigation of the event revealed previous difficulties with isolating and cleaning EHC filters. During filter cleanings, the vent plug was used to verify positive isolation and the absence of pressure and fluid. In 1989, it was concluded that an easier method to verify positive filter isolation would be to install vent valves and lines on the top of the filters. An Engineering Evaluation Request was generated to implement this modification, but was considered an enhancement and had low priority for implementation. This is considered a contributing factor to the event.

VI. Corrective Steps Which Have Been Taken and Results Achieved

The mechanics involved were formally reprimanded for their failure to adhere to the procedural requirements. A series of discussions were performed with all mechanical personnel stressing the importance of procedural adherence by the mechanical maintenance superintendent. Additionally, discussions concerning procedural compliance were held with all maintenance department personnel by the discipline superintendents and the manager of the plant maintenance section.

Plant management now requires direct supervisory attention to selected work being performed on trip critical systems which could impact plant reliability or result in undue safety system challenges.

The operations plant supervisor is now required to review the building operators' log books each shift.

The mechanical section turn-overs have been enhanced by requiring the 2330 hour mechanical shift to come in thirty minutes earlier to receive a more detailed turn-over from the mechanical supervisor. They also will attend the operations shift briefing. Additionally, they will be required to remain thirty minutes after their shift to ensure a thorough turn-over to the oncoming mechanical supervisor.

A review of outstanding documents (i.e., nonconformance documents, WOs, EERs, etc.) for other potential problems which may be related to trip critical systems was performed. The items identified during the review have been reviewed with appropriate management to ensure top priority is given to resolving these issues.

VII. Corrective Steps to be Taken to Preclude Further Violations

The control of work process procedures will be revised to require detailed briefings to be held between engineering (as applicable), maintenance and operation personnel on non-routine evolutions involving selected trip-critical and safety-related systems which could impact plant reliability or result in undue safety system challenges. Scope changes in the described activities would require the requesting individual to brief control room personnel concerning the proposed changes and possible impacts.

VIII. Date When Full Compliance Will Be Achieved

These actions will be completed by August 30, 1992.