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July 17, 1992

W. T. Cottle
Vice President
Operations
Grand Gulf Nuclear Station

U.S. Nuclear Regulatory Commission
Mail Station P1-137
Washington, D.C. 20555

Attention: Document Control Desk

SUBJECT: Grand Gulf Nuclear Station
Unit 1
Docket No. 50-416
License No. NPF-29
Reactor Scram Due to Turbine Control Fluid Filter
Maintenance
LER 92-013-00

GNRO-92/00091

Gentlemen:

Attached is Licensee Event Report (LER) 92-013 which is a final report.

Yours truly,

W. T. Cottle

WTC/RR/
attachment

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NRC Form 386 10-83										U.S. NUCLEAR REGULATORY COMMISSION APPROVED OMB NO. 3150-0104 EXPIRES 8-31-88									
LICENSEE EVENT REPORT (LER)																			
FACILITY NAME (1) Grand Gulf Nuclear Station										DOCKET NUMBER (2) 0 5 0 0 0 4 1 6					PAGE (3) 1 OF 7				
TITLE (4) Reactor Scram Due To Turbine Control Fluid Filter Maintenance																			
EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)										
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES			DOCKET NUMBER(S)							
0 6	1 8	9 2	9 2	0 1 3	0 0	0 7	1 7	9 2				0 5 0 0 0							
OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR 5. (Check one or more of the following) (11)																	
1		20.402(b)			20.405(e)			<input checked="" type="checkbox"/> 50.73(a)(2)(iv)			73.71(b)								
POWER LEVEL (10)		20.405(a)(1)(ii)			50.38(a)(1)			50.73(a)(2)(v)			73.71(c)								
1 1 0 1 0		20.405(a)(1)(iii)			50.38(a)(2)			50.73(a)(2)(vi)			OTHER (Specify in Abstract below and in Text, NRC Form 386A)								
		20.405(a)(1)(iv)			50.73(a)(2)(vii)			50.73(a)(2)(vii)(A)											
		20.405(a)(1)(v)			50.73(a)(2)(viii)			50.73(a)(2)(viii)(B)											
		20.405(a)(1)(vi)			50.73(a)(2)(ix)			50.73(a)(2)(ix)											
LICENSEE CONTACT FOR THIS LER (12)																			
NAME Riley Ruffin / Licensing Specialist										TELEPHONE NUMBER 6 1 0 1 4 3 7 - 1 2 1 1 6 1 7									
COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)																			
CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC	CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NRC					
SUPPLEMENTAL REPORT EXPECTED (14)										EXPECTED SUBMISSION DATE (15)									
<input type="checkbox"/> YES (If yes, complete EXPECTED SUBMISSION DATE)										<input checked="" type="checkbox"/> NO									
ABSTRACT (Limit to 7400 spaces, i.e., approximately fifteen single-spaced typewritten lines) (16)																			
<p>On June 18, 1992 during maintenance on a main turbine control fluid filter, a reactor scram occurred as a result of a high neutron flux condition due to partial closure of the main turbine stop and control valves. The filter which was to be changed had a leaking isolation valve which allowed the filter to remain at system pressure. The filter was not verified depressurized in accordance with procedures prior to an attempt to remove the filter cover. During the removal of the cover, the filter O-ring blew out which resulted in a control fluid spill and subsequent closure of the main turbine stop and control valves. Following the scram, vessel level decreased to approximately - 28 inches. Level was restored by feedwater and Reactor Core Isolation Cooling systems. This event did not compromise the safety of the public.</p>																			

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TEXT (If more space is required, use additional NRC Form 386A's) (17)

A. Reportable Occurrence

On June 18, 1992, a valid Reactor Protection System (RPS) [JC] actuation occurred which resulted in a reactor scram. The actuation signal was generated due to a high neutron flux condition as a result of partial closure of the main turbine stop and control valves. The occurrence is being reported pursuant to 10 CFR 50.73(a)(2)(iv).

B. Initial Conditions

The plant was in Operating Condition 1, with reactor power at 100 percent. Mechanical Maintenance was in the process of preparing an Electro-Hydraulic Fluid (EHC) filter for cleaning.

C. Description of Occurrence

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.

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TEXT (If more space is required, use additional NRC Form 388A's) (17)

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.

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TEXT (if more space is required, use additional NRC Form 306A's) (17)

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.

During the transient, vessel pressure increased to approximately 1120 psig. A total of eleven main steam safety relief valves automatically operated to relieve vessel pressure.

Following the scram, vessel level decreased to approximately - 28 inches. Vessel level was restored by feedwater [SJ] and Reactor Core Isolation Cooling [BN] systems. Plant condition were stabilized and recovery was performed in accordance with plant procedures.

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.

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TEXT (if more space is required, use additional NRC Form 365A's) (17)

D. Apparent Cause

Following an investigation the following causal factors were identified.

Lack of/Poor communication on the status of the uncompleted task.

The non-licensed operator generated CIs on problems identified during the attempt to isolate and change the filter. However, control room personnel and operation shift management were not made aware of the identified problems. Therefore, control room had no knowledge of the actual conditions.

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.

The mechanics involved during the previous shift performed a turnover to the oncoming maintenance specialist and mechanical supervisor, however, the details of problems with the filter were not discussed.

Neither the three-way valves or their actuator were in a preventative maintenance program.

Maintenance personnel failed to perform maintenance in accordance with the procedure.

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.

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TEXT (If more space is required, use additional NRC Form 368A's) (17)

E. Corrective Actions

Vent plugs were removed from the filters and vent valves installed as requested by the earlier EER. This resulted in an easier method to verify that the filter is positively isolated.

The mechanics involved were counseled (written reprimand) 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 work being performed on trip critical systems.

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

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.

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.

F. Supplemental Corrective Action

A preventative maintenance program will be established for the three-way valves and their actuators.

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TEXT (if more space is required, use additional NRC Form 366A's) (17)

G. **Safety Assessment**

The occurrence did not compromise the safety of the public at anytime. The actuation of RPS did not inhibit the function of any safety systems or components. Following the scram, vessel level decreased to a minimum of - 28 inches as indicated by the General Electric Transient Analysis Recorder System. This level was approximately 138 inches above the top of active fuel.

H. **Additional Information**

Energy Industry Identification System (EIIS) codes are identified in the text within brackets [].

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