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Waterford 3

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QA

July 17, 1991

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Subject: Waterford 3 SES
Docket No. 50-382
License No. NPF-38
NRC Inspection Report 91-17
NRC Enforcement Action 91-069
Reply to Notice of Violation

Gentlemen:

In accordance with 10CFR2.201, Entergy Operations, Inc. hereby submits in Attachment 1 the response to the Notice of Violation of the subject Enforcement Action.

If you have any questions concerning this response, please contact Roy Prados at (504) 739-6632.

Very truly yours,

RF Burski

RFB/RWP/dc
Attachment
cc: R.D. Martin, NRC Region IV
D.L. Wigginton, NRC-NRR
R.B. McGehee
N.S. Reynolds
NRC Resident Inspectors Office

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ATTACHMENT 1

ENTERGY OPERATIONS, INC. RESPONSE TO THE VIOLATIONS IDENTIFIED IN ENFORCEMENT ACTION 91-069

VIOLATION I (SEVERITY LEVEL IV - 382/9117-01)

Failure To Ensure Satisfactory Isolation Boundaries

Waterford 3 Technical Specification 6.8.1.a requires, in part, that written procedures shall be implemented covering activities referenced in Appendix A of U.S. Nuclear Regulatory Commission Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Section 9a, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures.

Waterford 3 Administrative Procedure UNT-005-003, "Clearance Requests, Approval, and Release," Revision 9, Sections 4.3.1 and 4.3.2, states that regarding the responsibility of the Shift Supervisor/Control Room Supervisor (SS/CRS):

4.3.1 The SS/CRS is responsible for implementation of this procedure on a day-to-day basis.

4.3.2 He ensures that the isolation boundaries selected for systems and components are satisfactory to protect personnel and equipment.

Contrary to the above, on May 5, 1991, the Shift Supervisor/Control Room Supervisor did not ensure the establishment of proper isolation boundaries for maintenance on High Pressure Safety Injection Valve SI-512A being worked under WA 01065402. This resulted in an interruption of shutdown cooling (SDC) for approximately 19 minutes.

VIOLATION II (SEVERITY LEVEL IV - 382/9117-02)

Failure To Obtain Authorization For Work Scope Change

Waterford 3 Technical Specification 6.8.1.a requires, in part, that written procedures shall be implemented covering activities referenced in Appendix A of U.S. Nuclear Regulatory Commission Regulatory Guide 1.33, Revision 2, February 1978. Regulatory Guide 1.33, Section 9a, states, in part, that maintenance that can affect the performance of safety-related equipment should be properly preplanned and performed in accordance with written procedures.

Waterford 3 Administrative Procedure UNT-005-015, "Work Authorization Preparation and Implementation", Revision 1, Section 5.10.1, states, in part, that any change to a work authorization (WA) which affects the scope or intent or acceptance criteria shall be authorized, prior to initiating the change, by the MAS; SS/CRS for controlled maintenance WA's, by Operations Quality Assurance for quality-related WA's, by Engineering for WA's previously reviewed by Engineering, by the Shift Technical Advisor (STA) for WA's previously reviewed by the STA, and by Nuclear Operations Engineering and Construction (NOEC).

Contrary to the above, on May 5, 1991, the Mechanical Maintenance Supervisor changed the scope of WA 01065402 by deleting the requirement for a freeze seal without obtaining authorization prior to initiating the change.

RESPONSE

Event Summary And Background Information

Maintenance on high pressure safety injection check valve SI 512A was scheduled for Refuel 4. On April 18, 1991, a carbon dioxide (CO2) freeze seal was placed on the horizontal piping between the high point vent and SI 512A (located at 23 feet 10 inches MSL). The RCS level was approximately 44 feet (MSL) with the plant in Mode 6 and with the SDC "A" train in service. While attempting to remove the bonnet retaining ring on SI 512A, excessive drainage occurred and the CO2 freeze seal began to melt. The repairs were then halted and the cap screws to the bonnet were re-torqued.

On April 25, 1991, a nitrogen freeze seal was attempted on the same segment of piping and the same problem recurred.

On May 5, 1991, discussions between the Operations, Maintenance, and Planning & Scheduling Departments resulted in a decision to work SI 512A without a freeze seal. Plant conditions at that time were Mode 5, RCS level of 19 feet (MSL) and SDC "B" train in service. At 1655 hours, while working SI 512A, indications of problems were observed. Locally the bonnet was drawn into the valve and as well as the inleakage of air. The Control Room noted an increase in RCS level and a decrease in SDC flow and low LPSI pump motor amperage.

At 1656 hours, off-normal procedure OP-901-046, Shutdown Cooling Malfunction, was entered and containment evacuation and closure were ordered. The vacuum priming pumps for the LPSI system were placed into service and LPSI pump "B" was vented, when it was noted that these pumps were drawing significant amounts of air. The Control Room staff were aware of the maintenance being conducted on SI 512A and quickly diagnosed SI 512A as the most probable source of the air ingestion. LPSI pump "B" was secured and SDC train "A" was placed into service at 1715 hours. The highest core exit thermocouple (CET) temperature observed was 110 degrees F.

At 1727 hours, the maintenance hatch was in place with four bolts tightened. At 1728 hours, CET temperature had returned to 99 degrees F. With plant conditions stable at 1737 hours, SDC malfunction procedure OP-901-046 was exited. At 2023 hours, SDC train "B" was restored to operable status.

The SDC malfunction that occurred on May 5, 1991 was different from the two previous SDC events that occurred at Waterford 3, in 1986 and 1988 respectively. The previous events were related to inaccurate RCS level indication. The May 5th SDC malfunction was initiated with the removal of the bonnet from SI 512A. SI 512A is located at elevation 23 feet 10 inches (MSL). Removal of the bonnet provided an air opening, at atmospheric pressure, on a three inch piping path located at an elevation of 23 feet 10 inches (MSL). The three inch piping connects to the top of a loop seal, located at an elevation of 23 feet (MSL). With the RCS level at 19 feet (MSL), the loop seal was drained and subsequently the LPSI pump "B" became air bound and lost NPSH, resulting in a loss of SDC flow.

Before the event occurred, significant management attention was focused on SDC. Since October 1988, the Waterford 3 Shutdown Cooling/Outage Risk Assessment Task Force met over 40 times devoting over 20,000 man-hours reviewing industry events and reviewing the adequacy of controls, procedures, equipment and training designed to prevent a loss of SDC. As a result of the Task Force efforts, numerous achievements were made in understanding SDC events, implementing design changes for improved RCS level indication, enhancing administrative controls/procedures, conducting numerous SDC related analyses, conducting an internal audit of SDC activities, conducting industry surveys, making a technical specification change, review of outage activities that could impact SDC, and training.

The above actions contributed to the prompt mitigation of the event. Operator and Mechanic responses were quick and appropriate, the off-normal procedure was entered and exited efficiently, and containment closure and evacuation occurred in a timely fashion. RCS level instrumentation performed as designed during the event. Recovery from the event was timely without resulting in endangering the health and safety of the public or plant personnel.

Reason For Violations

An extensive root cause investigation of this event was conducted considering broad spectrum implications. The conclusion was that the root cause for the event lead to both violations, to which Entergy Operations, Inc. admits. The root cause of the SDC malfunction was the collective decision by the Operations, Maintenance, and Planning & Scheduling Departments to repair SI 512A without the required freeze seal. The decision to delete the freeze seal requirement from the work package was simply based on the RCS level being above 18 feet (MSL), which is the current reduced inventory threshold for Waterford 3. Thinking this was a benign change, the decision was made without an adequate technical review of system design and arrangement.

The decision resulted in the work package change being made and the work conducted without the SS/CRS ensuring proper isolation boundaries (as required by UNT-005-003) and without proper prior authorization (as required by UNT-005-015).

Corrective Steps That Have Been Taken

Since May 5, 1991, the event was discussed with Operations, Maintenance, and Planning & Scheduling Department supervisory personnel. In addition, the Outage Risk Assessment Task Force has discussed the event and has initiated actions to review and evaluate administrative and work controls to prevent SDC problems in the future.

Corrective Steps Which Will Be Taken To Avoid Further Violations

The following corrective actions are scheduled to address the root cause:

1. This event will be discussed on a recurring basis with the appropriate Operations, Maintenance and Planning & Scheduling Department personnel prior to each refueling outage.

2. Current administrative controls to prevent SDC and RCS inventory problems are being evaluated. Appropriate revisions will be made as necessary.

3. Current work controls to prevent SDC and RCS inventory problems are being evaluated. Appropriate revisions will be made as necessary.

4. Maintenance Procedure MD-001-026, Maintenance Department Work Center Planning, will be revised to require enhanced planning at all levels for work packages that may impact SDC.

5. RCS perturbation log requirements to identify/evaluate potential RCS perturbations will be extended to RCS fill and vent operations.

6. A composite isometric drawing of the SDC system will be developed to be used by Operations, Maintenance, and Planning & Scheduling Department personnel to provide information on critical elevations for system components and piping.

It is felt that the above broad spectrum of corrective actions should preclude similar events at Waterford 3 in the future.

Date When Full Compliance Will Be Achieved

Corrective actions associated with these violations will be complete prior to entering SDC during the next refueling outage, Refuel 5.