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 RECIP. NAME RECIPIENT AFFILIATION
 BUTLER, W.R. Project Directorate I-2

see Rpt

SUBJECT: Suppls 890612 & 1221 responses to Enforcement Action 89-042
 re exceeding Tech Spec reactor vessel cooldown rate limit on
 890112. Requests formal NRC review of util response.

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FEB 21 1991

Director of Nuclear Reactor Regulation
Attention: Dr. W. R. Butler, Project Director
Project Directorate I-2
Division of Reactor Projects
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

SUSQUEHANNA STEAM ELECTRIC STATION
REQUEST FOR NRR REVIEW OF
RESPONSE TO ENFORCEMENT ACTION 89-042
PLA-3516 FILES R41-1C, R41-2

Docket Nos. 50-387
and 50-388

- References: 1. Letter, PLA-3204, H.W. Keiser to W.F. Kane, "Response to Enforcement Action 89-042", dated June 12, 1989.
2. Letter, PLA-3235, H.W. Keiser to W.F. Kane, "Supplemental Information to Enforcement Action 89-042", dated December 21, 1989.

Dear Dr. Butler:

Reference 1 presented PP&L's response to NRC Enforcement Action 89-042, which dealt with Susquehanna SES Unit 1 exceeding the Technical Specification reactor vessel cooldown rate limit on January 12, 1989. In that letter, we established a position regarding the appropriate method for determining compliance with that limit. We further stated that our position would not be utilized until NRC concurrence was received.

Reference 2 provided a more detailed evaluation of PP&L's position, including a report prepared by General Electric.

It has been our understanding that this material has yet to have been reviewed by the NRC. Based on discussions with your staff, all of the aforementioned references are hereby transmitted to your office with our formal request for NRR review.

- 2 - FILES R41-1C, R41-2 PLA-3516
Dr. W. R. Butler

We appreciate your prompt attention to this matter. Please note that the General Electric report attached to Reference 2 is proprietary and was submitted in accordance with 10CFR2.790. PP&L requests that NRC continue to treat the report as proprietary. Any questions should be directed to Mr. J.M. Kenny at (215) 774-7904.

Very truly yours,



H. W. Keiser

Attachments

cc: Document Control Desk (original)
NRC Region I
Mr. G.S. Barber, NRC Sr. Resident Inspector
Mr. M.C. Thadani, NRC Project Manager



RESPONSE TO NOTICE OF VIOLATION

VIOLATION A.1 (387/89-01-02)

Technical Specification 6.8.1 requires that written procedures important to safety shall be established and implemented.

Susquehanna Steam Electric Station (SSES) Surveillance Procedure SO-100-011, Reactor Vessel Temperature and Pressure Recording, step 6.1.4, requires confirmation of compliance with Technical Specification (T.S.) 4.4.6.1.1 once every 30 minutes by verifying a maximum cooldown rate of less than 100 degrees F per hour.

Contrary to the above, on January 12, 1989, SSES Unit 1 experienced a cooldown in excess of the required limits in that during the first hour following a reactor scram, the actual cooldown rate at the reactor vessel bottom head drain was about 137 degrees F in the first 45 minutes and was mitigated to 101 degrees F by natural circulation in the first hour. The fact that the TS limit was exceeded was not discovered until January 16, after the unit had been restarted.

RESPONSE:

Reference LER 50-387/89-002-00 for more details concerning this event.

1. Corrective Steps Which Have Been Taken And The Results Achieved:

- a. Operations Supervision reviewed the incident with the operator involved.
- b. An engineering evaluation was performed to determine the effects of the out-of-limit condition. The evaluation concluded that the structural integrity of the reactor coolant system was still within design limits and that the unit remains acceptable for continued operation.

2. Corrective Steps Which Will Be Taken To Avoid Further Violations:

- a. The cooldown event will be reviewed with all Operation's shifts during Supervisor of Operations Agenda training 89-01. This training will be completed for all shifts by June 21, 1989.
- b. PP&L is completing an evaluation of the design bases for reactor pressure vessel fatigue and brittle fracture analyses which includes their relationship to Tech. Spec. requirements. This evaluation will conclude and defend that the 100°/hr. cooldown rate in Tech. Specs. was never intended nor required to be applied to the bottom head drain temperature. The bottom head region of the vessel has been analyzed for events much more severe than the 100°/hr. that is experienced in the beltline region of the vessel during normal heat up and cooldown.

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PP&L will provide a detailed report to the NRC which will discuss the fatigue and fracture mechanics design bases relative to Tech. Spec. interpretations. This is currently scheduled for completion by July 15, 1989. PP&L will continue to monitor bottom head drain temperature against the 100°/hr. Tech. Spec. limit until the NRC has reviewed and accepted our rationale.

3. Date When Full Compliance Will Be Achieved:

Based on (1) above, PP&L is in full compliance.

VIOLATION A.2 (387/89-01-02)

Technical Specification 6.8.1 requires that written procedures important to safety shall be established and implemented.

SSES Emergency Operating Procedure EO-100-101 (Attachment A), "Scram", specifies that CRD flow shall be decreased to 20-25 gpm following a reactor scram if a reactor recirculation pump cannot be started.

Contrary to the above, on January 12, 1989, following a reactor scram, flow remained at least 60 gpm, although neither reactor recirculation pump could be started.

DISCUSSION

PP&L does not concur that a violation occurred. Following the Reactor Scram on January 12, Operations personnel properly implemented EO-100-101. The procedure step requiring CRD flow to be reduced comes after it is determined that a Recirculation Pump can not be started. This condition did not exist following the January 12th scram. When the pump restart step was ultimately reached in the EO sequence, it was started on a first attempt. Therefore, no corrective action is necessary.

VIOLATION A.3 (387/89-01-03)

Technical Specification 6.8.1 requires that written procedures important to safety shall be established and implemented.

SSES Procedure, GO-100-003, "Power Operation", requires during plant power ascension, the operator to establish automatic feedwater control, verify that reactor vessel level remains at 35 inches and reactor feedwater pump (RFP) speed decreases accordingly, and open the RFP discharge valves when RFP discharge pressure is within 50-100 psig of reactor vessel pressure.

Contrary to the above, on January 12, 1989, during power ascension, the operator did not verify that the feedwater master controller was in automatic and that the vessel level remained at 35 inches with the RFP speed decreasing accordingly. In addition, the operator opened the RFP discharge valves at 150 psig above reactor vessel versus the 50-100 psig specified in the procedure. This resulted in a reactor water level transient and plant scram.

RESPONSE:

Reference LER 50/387-89-002-00 for more details concerning this event.

1. Corrective Steps Which Have Been Taken And The Results Achieved:

- a. A positive behavior reinforcement concept was utilized for training of this event. The Operations Supervisor reviewed the incident with the operator involved. Then the involved operator developed training pertinent to the event in accordance with the operating procedure, and conducted training for all licensed operators prior to their assuming shift duties before the Unit 1 startup.
- b. The Supervisor of Operations conducted team training for all licensed operators. Supervision involvement in critical evolutions, insuring proper checks and balances and taking the time to do the job correctly and in accordance with approved procedures were the topics discussed.
- c. The Nuclear Training Group also provided additional training and practice with feedwater controls, focusing on the transfer to automatic feedwater level control, in accordance with the operating procedure.
- d. Enhancements for clarity purposes were made to the applicable operating procedure concerning the establishment of automatic feedwater level control.
- e. Training for GO-100/200-003 was conducted for all Operation's shifts.

2. Corrective Steps Which will Be Taken to Avoid further Violations:

No further action is required.

3. Date When Full Compliance Will Be Achieved:

Based on the above, PP&L is in full compliance.

VIOLATION B.1 (387/89-01-03)

Technical Specification 6.8.1 and Regulatory Guide 1.33 require that written procedures be established for activities and systems that are important to safety, including the filling and venting of the Shutdown Cooling System.

Contrary to the above, the fill and vent procedure for the Unit 1 Residual Heat Removal Shutdown Cooling System (SDC) allowed forming a void in the system during fill and vent following a Residual Heat Removal Pump trip. This resulted in a system isolation on high flow during attempts to restore SDC on January 1, 1989.

RESPONSE:

Reference LER 50-387/89-003-00 for more details concerning this event.

1. Corrective Steps Which Have Been Taken And The Results Achieved:

- a. The filling and venting section of operating procedure OP-149/249-002, "RHR Operation in the Shutdown Cooling Mode," was revised to provide additional assurance that the system piping is completely filled prior to placing the RHR System into shutdown cooling.
- b. Training for OP-149/249-002 was conducted for all Operation's shifts.
- c. Modifications were made which added time delays to the isolation instrumentation to preclude spurious actuations. These circuit modifications have been implemented on Unit 1 and will be implemented on Unit 2 prior to the units next entrance into Condition 4.

2. Corrective Steps Which Will Be Taken To Avoid Further Violations:

No further action is required.

3. Date When Full Compliance Will Be Achieved:

Based on the above, PP&L is in full compliance.

VIOLATION B.2 (387/89-01-03)

Technical Specification 6.8.1 and Regulatory Guide 1.33 require that written procedures be established for activities and systems that are important to safety, including plant shutdown and cooldown.

Contrary to the above, SSES Procedures GO-100-005, "Plant Shutdown From Minimum Power Operation", and GO-100-011, "Plant Cooldown Following A Scram", allowed an automatic reactor trip to occur following a manual shutdown when the operator did not bypass the scram discharge volume high level trip prior to resetting the initial manual scram on February 4, 1989.



DISCUSSION

One of the two operating procedures, GO-100-011, "Plant Cooldown Following a Scram," did not contribute to this event because it does not contain any Scram reset instructions. Rather, it provides instructions for continuation of plant cooldown following a scram, or anytime recirculation pumps are not running, to cold shutdown (Condition 4). Therefore, no revision to GO-100-011 is required.

RESPONSE:

Reference LER 50-387/89-006-00 for more details concerning this event.

1. Corrective Steps Which Have Been Taken And The Results Achieved:

- a. Operating procedure, GO-100-005, "Plant Shutdown From Minimum Power," was revised to provide explicit direction to place the SDV high level trip bypass control switch to the BYPASS position prior to resetting the SCRAM. GO-100-004, Plant Shutdown To Minimum Power, as well as the corresponding procedures for Unit 2, were similarly revised.
- b. Training for GO-100/200-004 and GO-100/200-005 was conducted for all Operation's shifts.

2. Corrective Steps Which Will Be Taken To Avoid further Violations:

Subsequent to the issuance of LER 50-387/006-00, it was determined that an additional revision to GO-100/200-005 is required to provide better coordination between GO-100/200-005 and GO-100/200-011 when recirculation pumps are not running. GO-100/200-005 is being revised accordingly.

3. Date When Full Compliance Will Be Achieved:

Based on (1) above, PP&L is in full compliance. GO-100/200-005 will be revised by June 23, 1989.

VIOLATION B.3 (387/89-01-03)

Technical Specification 6.8.1 and Regulatory Guide 1.33 require that written procedures be established for activities and systems that are important to safety, including operation of the Instrument Air System.

Contrary to the above, the Unit 1 Instrument Air (IA) System operating procedure did not adequately address a change in system lineup to provide air to the circulating water pump house common loads from the Unit 2 IA system. This contributed to operations performing the lineup without the use of a procedure, leading to a reactor trip on January 4, 1989.



RESPONSE:

Reference LER 50-387/89-001-00 for details concerning this event.

1. Corrective Steps Which Have Been Taken And The Results Achieved:

- a. The operating procedures for the Unit 1 and Unit 2 Instrument Air Systems, OP-118-001 and OP-218-001, and the corresponding valve lineup checklists were revised to change the normal air supply to the circulating water pumphouse, chlorination building and control structure common loads, to the Unit 2 Instrument Air System. The revision also incorporated a Plant Policy that Instrument Air System alignment will not normally be such that a single failure can shutdown both units. In those cases when such an alignment is judged necessary (e.g., supplying IA header with opposite unit's IA system), the procedure now requires that the PP&L System Power Dispatcher be notified, contains explicit direction for the IA system lineup and requires the Shift Supervisor's permission.
- b. Training for OP-118/218-001 was conducted for all Operation's shifts.

2. Corrective Steps Which Will Be Taken To Avoid Further Violations:

No further action is required.

3. Date When Full Compliance Will Be Achieved:

Based on the above, PP&L is in full compliance.

VIOLATION B.4 (387/89-01-03)

Technical Specification 6.8.1 and Regulatory Guide 1.33 require that written procedures be established for activities and systems that are important to safety, including operation of the Feedwater System.

Contrary to the above, SSES Procedure GO-100-003, "Power Operation", did not adequately address the transition from the low load valve to the main feedwater discharge valves thereby contributing to a feedwater transient which resulted in the reactor trip on January 12, 1989.

DISCUSSION

While PP&L acknowledges that the operating procedure GO-100-003, "Power Operation," could have been clearer, we believe that adequate guidance was provided to the operator for the transfer to automatic feedwater level control via the procedure and training. PP&L attributes the cause of the feedwater transient and subsequent scram on January 12, 1989 to cognitive personnel error on the part of the operator.

RESPONSE:

Reference LER 50-387/89-002-00 for more details concerning this event.

1. Corrective Steps Which Have Been Taken And The Results Achieved:

- a. Those sections concerning the establishment of automatic feedwater level control for the Unit 1 and Unit 2 procedures for "Power Operation", GO-100-003 and GO-200-003 were enhanced for clarity purposes.
- b. Training for GO-100/200-003 was conducted for Operation's shifts.

2. Corrective Steps Which Will Be Taken To Avoid Further Violation:

No further action is required.

3. Date When Full Compliance Will Be Achieved:

Based on the above, PP&L is in full compliance.