

December 9, 1999

Southern Nuclear Operating Company, Inc.
ATTN: Mr. H. L. Sumner, Jr.
Vice President
P. O. Box 1295
Birmingham, AL 35201-1295

SUBJECT: MEETING SUMMARY - DISCUSSION OF JUNE 15, 1999, UNIT 2 REACTOR
TRIP AND SUBSEQUENT EQUIPMENT FAILURES - HATCH - DOCKET NOS.
50-321 AND 50-366

Dear Mr. Sumner:

This refers to the open management meeting that was conducted at your request at the NRC Region II Office on December 8, 1999, to discuss the June 15, 1999, Unit 2 reactor trip and subsequent equipment failures. A list of attendees and a copy of your presentation handouts are enclosed.

It is our opinion that this meeting was beneficial in that we were able to review the results of your root cause analysis, lessons learned, and corrective actions. The meeting also provided the NRC an opportunity to discuss your management initiatives with respect to human performance and self-assessments.

In accordance with Section 2.790(a) of the NRC's "Rules of Practice," Part 2, Title 10, Code of Federal Regulations, a copy of this letter and its enclosures will be placed in the NRC Public Document Room.

Should you have any questions concerning this meeting, please contact us.

Sincerely,

(Original signed by Pierce H. Skinner)

Pierce H. Skinner, Chief
Reactor Projects Branch 2
Division of Reactor Projects

Docket Nos. 50-321, 50-366
License Nos. DPR-57, NPF-7

Enclosures: 1. List of Attendees
2. Licensee Presentation Handouts

cc w/encls: (See Page 2)

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OFFICIAL RECORD COPY

DOCUMENT NAME: G:\HATCH\meetsum1.wpd

List of Attendees

Nuclear Regulatory Commission

L. Reyes, Regional Administrator, Region II
V. McCree, Deputy Director, Division of Reactor Safety (DRS)
P. Skinner, Chief, Reactor Projects Branch 2, Division of Reactor Projects (DRP)
J. Munday, Senior Reactor Inspector, Hatch, DRP
B. Holbrook, Senior Project Engineer, DRP
R. Bernhard, Senior Reactor Analyst, DRS
V. Hodge, Events Assessment Branch, Office of Nuclear Reactor Regulation
P. Fillion, Reactor Inspector, DRS

Southern Nuclear Operating Company, Inc. (SNC)/ Southern Company Services (SCS)

L. Sumner, Vice President, Hatch, SNC
P. Wells, General Manager, Hatch, SNC
S. Tipps, Manager, Nuclear Safety and Compliance, Hatch, SNC
K. McElroy, Manager, Engineering, SNC
D. Crow, Manager Licensing, SNC
L. Bergen, Hatch Resident Manager, Oglethorpe Power Corporation
C. Lindell, Site Representative, Municipal Electric Authority of Georgia

*SNC/NRC Management
Meeting*



Energy to Serve Your WorldSM

December 8, 1999



PURPOSE OF VISIT

- Review Unit 2 Loss of Vacuum Event
- Provide Update on NRC Issues from Event
- Summary of Issue Resolution
- Broader Management Initiatives
- Closing Remarks



Review of Event

June 3, 1999

- Lowered flume level for chlorination activities at or below flume level that resulted in substantial quantity of air entrained into condenser water boxes.

June 15, 1999

- 2010 - Shift observed decrease in condenser vacuum & reduced power to ~67%
 - 2025 - Improving condenser vacuum trend observed and power reduction stopped at 42% by 2045
 - 2050 - 'B' reactor feedpump removed from service and power reduction resumed at 2055 due to decreasing vacuum
 - 2108 - Turbine low vacuum annunciator alarmed with power reduction stopped at 29% at 2110
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Review of Event

June 15, 1999

- 2124 - Manual scram inserted, non-safety 4kv buses 'C' & 'D' failed to auto transfer to offsite power source
- 2125 - Manually initiated RCIC for reactor vessel level control
- 2138 - 4kv bus 'C' re-energized
- 2139 - 4kv bus 'D' re-energized
- 2154 - 'A' recirc pump restarted
- 2200 - Attempted to restart 'B' recirc pump & received ground on Unit 1 'D' 600V bus and other Unit 1 600V switchgear
- 2221 - Operators closed outboard main steam isolation valves (MSIVs)
- 2225 - Operators directed to break condenser vacuum
 - Inboard MSIVs automatically closed with the exception of the 'B' MSIV
- 2240 - 'B' loop of RHRSW pump started for torus cooling with 'A' loop of RHRSW subsequently started for torus cooling



Review of Event

June 16, 1999

- 0023 - HPCI started for reactor vessel pressure control
- 0150 - Reactor building sump High-High-High level alarm received & RHRSW vent line found broken
- 0155 - 'A' loop RHRSW pumps secured due to leakage
- 0543 - 'A' CRD pump tripped on low suction pressure
- 1031 - 'A' loop of RHR re-established for torus cooling following vent line repair

June 22, 1999

- 0650 - Began startup of the reactor

June 23, 1999

- 1350 - Generator synchronized to grid

June 25, 1999

- 0703 - Unit at 100% maximum operating power (MOP)



NRC Issues Identified

- RCIC Operation
 - Subsequent to event the system engineer confirmed RCIC operated properly
 - Revised procedures and changed system settings to enhance operation of the system
 - Developed enhanced training to ensure operators are aware of expected system behavior given similar future events



NRC Issues Identified

- Management of ERT Recommended Corrective Actions
 - Premise of ERT is to identify causes for event and corrective actions to prevent recurrence
 - For the previous ERT recommended corrective actions, a comprehensive re-review for was not performed for the changes in corrective actions
 - Management policy is for changes to ERT recommendations to be reviewed with the General Manager along with ERT leader to ensure the causes for the event are adequately addressed
 - Procedure changes are being made to formalize this policy and to designate a manager to have oversight responsibility for each ERT



NRC Issues Identified

- Management of ERT Recommended Corrective Actions (Continued)
 - Completed Corrective Actions :
 - Revised flume low level alarm setpoint
 - Revised procedures to maintain circ water suction pit operating level such that the likelihood of abnormal air entrainment is minimized
 - Cameras installed allowing operators to monitor circ water suction pit level & operator verifies level locally during chlorination and radwaste discharge
 - Reviewed design process and identified that actual vent performance was not adequately reviewed or communicated
 - Isolated all but one continuous vent & require manual vent if needed



NRC Issues Identified

- Management of ERT Recommended Corrective Actions (Continued)
 - Interim Short Term Actions
 - Prevent air from entering water boxes
 - Assure circ water pit level remains >116 ft. using cameras, stillwell indication and personnel observation
 - If air is entrained
 - Procedures require water boxes to be manually vented
 - One 2 inch vent is open on the ‘D’ water box
 - Additional operator aids
 - Flume level alarm
 - Process computer vacuum alarm



NRC Issues Identified

- Long Term Actions to Further Prevent Recurrence of Event
 - Add circ water suction pit level alarms (Unit 2 Spring 2000 / Unit 1 Fall 2000)
 - Install continuous vents (Under review for implementation - Unit 1 Fall 2000 / Unit 2 Fall 2001)
 - Automate flume level control (Under review for implementation - Unit 1 Spring 2002 / Unit 2 Fall 2001)
- Additional Long Term Actions Under Consideration
 - Add adjustable Unit 2 condenser vacuum alarm
 - Add condensate depression indication alarms
 - Extend Unit 1 & 2 PSW/RHRSW flume discharge piping beneath water level in flume



NRC Issues Identified

- RHRSW Vent Line Issue
 - Hatch considered RHRSW vent line failure to require a cause determination due to the potential of impacting torus cooling capability
 - No reasonable opportunities were identified that would have enabled Hatch management to foresee failure of this small bore pipe.
 - 5 small bore piping failures identified by NRC occurred over a 6 year time frame
 - Hatch normally reviews deficient conditions for previous similar events over the previous 2 years as one measure of determining if it is significant from a 10CFR50 Appendix B perspective
 - Review for previous similar events revealed one failure of small bore piping within the previous 2 year time frame
 - Hatch performed appropriate reviews of small bore piping failures as they occurred with appropriate corrective actions taken
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NRC Issues Identified

- RHRSW Vent Line Issue
 - Completed Corrective Actions
 - Completed broadness review which included inspection & testing of similar configurations on RHR, RHRSW, & HPCI with no anomalies identified
 - Planned Corrective Actions
 - Additional inspection and testing
 - Complete training on high cycle fatigue and apply that training in collecting and analyzing vibration data for small bore piping
 - Enhance site welding procedures for small bore welds



NRC Issues Identified

- Control Rod Drive (CRD) Suction Filter Issue
 - Operations initiated maintenance work order (MWO) on 3/01/99 due to differential pressure (ΔP) being above procedure limits(4 psid versus 3.99 psid)
 - Operations resolved the immediate high differential pressure (ΔP) problem by backwashing the filter
 - MWO left open to support future work on the filter
 - Operations shift personnel did not consider outstanding MWO as an immediate operational concern following backwash efforts
 - On 6/10/99 Maintenance received Operations permission to work MWO and no problem was found
 - Maintenance subsequently replaced the filter on 6/16/99
 - Delay on working the CRD MWO based on Operations priorities and not MWO backlog
 - Hatch concurs with inspector that safety related equipment maintenance is properly scheduled and repaired in accordance with plant procedures and safety significance
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NRC Issues Identified

- Cable Connector for 'A' & 'B' Recirc Valves
 - Problem with 'B' recirc valve cable connector not apparent.
 - Problem experienced with connector on 'A' valve thought to be isolated at the time initial ground occurred since no other ground problem was present
 - Since ground on 'A' considered isolated and not considered significant from 10CFR50 Appendix B perspective, which did not require a broadness review and cause determination
 - Following Unit 2 startup after the June 15th event, discovered connector was incorrect size as part of investigation into the cause of the grounded connector
 - Similar connection was fabricated in the Maintenance shop
 - Integrity of the connection was confirmed to be sufficient to consider the affected recirc valves operable until the next outage of sufficient duration to allow replacement of the connectors



NRC Issues Identified

- Identification, Trending, & Evaluating Causes of Repetitive BOP Instrument Drift
 - No indication existed that would allow drift concern to be foreseen
 - At the time of the event the affected relays were part of routine balance of plant (BOP) instrument calibration program
 - Following a reactor scram in May 1999 the affected relays functioned properly and loads transferred to offsite power as designed
 - A trending program has been developed for I&C Technicians to use in identifying repetitive setpoint drift and reliability problems
 - I&C identifies repetitive instrument drift / reliability issues which are evaluated by Engineering Support and placed into the corrective action program as necessary



Summary of NRC Issue Resolution

- Lessons Learned
 - Understand more clearly the sensitivity of the circulating water system to pump suction pit level
 - Learned that actual vent performance was not adequately reviewed or communicated as part of design process for recently installed continuous vents
 - Effects on heat removal capability may not be immediately evident
 - Significant air can be entrained in system from lowering level only a few feet
- Completed Interim Short Term Corrective Actions to Significantly Reduce Likelihood of Event Recurrence
- Planned Long Term Corrective Actions to Further Reduce Likelihood of Recurrence
- Improved Management of Corrective Actions



Broader Management Initiatives

- Human Performance
 - Top Level Southern Company Management Emphasis in Area of Human Performance
 - Employee Forums
 - Human Performance Indicators
 - Appearance Initiatives
- Management Self-Assessment
 - Human Performance
 - Corrective Action Program
 - Design Change Issues
 - Change Management & Workload Management



