



July 29, 2002

L-2002-149
10 CFR 50.4

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
Generic Letter 96-06 Supplemental Response
Resolution of Waterhammer Issues


By letter dated April 25, 2002, the NRC requested that Florida Power & Light Company (FPL) complete the remaining actions regarding Generic Letter (GL) 96-06, *Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions*, by July 30, 2002, or contact the NRC to discuss alternate arrangements. The remaining GL 96-06 action for St. Lucie Units 1 and 2 is addressing waterhammer. FPL plans for resolution of waterhammer are attached. These plans, in general terms, have been discussed with the St. Lucie NRC Project Manager.

FPL currently intends to establish water pressure and water flow to the containment fan coolers before boiling occurs thereby essentially eliminating waterhammer. Summary of NRC commitments in this letter:

- FPL will complete the waterhammer evaluation and update the response to the NRC by March 15, 2003.
- For St. Lucie Unit 1, the corrective actions will begin during the fall 2002 refueling Outage (SL1-18) and be completed by the end of the spring 2004 refueling outage (SL1-19).
- For St. Lucie Unit 2, the corrective actions will begin during the spring 2003 refueling outage (SL2-14) and be completed by the end of the fall 2004 refueling outage (SL2-15).

Please contact George Madden at 772-467-7155 if there are any questions about this submittal.

Very truly yours,


Donald E. Jernigan
Vice President
St. Lucie Plant

DEJ/GRM

Attachment

AD72

St. Lucie Units 1 and 2
Resolution of Generic Letter 96-06 Waterhammer Issues

Summary:

By letter dated April 25, 2002, the NRC requested that Florida Power & Light Company (FPL) complete the remaining actions regarding Generic Letter (GL) 96-06, *Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions*, by July 30, 2002, or contact the NRC to discuss alternate arrangements. The remaining action for St. Lucie Units 1 and 2 is addressing waterhammer. FPL currently intends to establish water pressure and water flow to the containment fan cooler before boiling occurs thereby essentially eliminating waterhammer conditions. For St. Lucie Unit 1, these actions are planned to begin during the fall 2002 refueling Outage (SL1-18) and be completed during the spring 2004 refueling outage (SL1-19). For St. Lucie Unit 2, these actions are planned to begin during spring 2003 refueling outage (SL2-14) and be completed during the fall 2004 refueling outage (SL2-15).

Background:

By letter L-98-276 dated October 30, 1998, FPL outlined the need for further analysis of waterhammer concerns expressed in GL 96-06. To conduct this analysis, St. Lucie worked with Electric Power Research Institute (EPRI). By letter dated March 27, 2000, the NRC closed the two-phase flow and thermally induced pressurization of piping aspects of GL 96-06.

EPRI completed the waterhammer analysis methodology and documented their conclusions in TR-113594, *Resolution of Generic Letter 96-06 Waterhammer Issues Volumes 1&2*. By letter dated April 3, 2002, the NRC approved the EPRI report for use. The NRC staff determined that use of this EPRI report for evaluating waterhammer issues was acceptable within the limitations stated in the EPRI report and the NRC safety evaluation report.

By letter dated April 25, 2002, the NRC requested that Florida Power & Light Company (FPL) complete the remaining actions regarding GL 96-06 by July 30, 2002, or contact the NRC to discuss alternate arrangements.

FPL Action Plan:

FPL has evaluated the NRC endorsed EPRI report. Our review indicates that, although the EPRI methodology provides a reduction in expected waterhammer pressures within the component cooling water (CCW) system, the reduction is less than FPL had expected.

During the EPRI report review process, additional measures to further reduce or eliminate waterhammer loads were developed. St. Lucie Plant intends to establish

water pressure and water flow to the containment fan cooler before boiling occurs thereby essentially eliminating waterhammer conditions.

In order to resolve the waterhammer issue, FPL intends to move the component cooling water (CCW) pump motors on both units to an earlier emergency diesel generator (EDG) loading block to establish water pressure and flow to the containment fan coolers before boiling occurs.

- Unit 1 modifications are planned during the fall 2002 refueling Outage (SL1-18)
- Unit 2 modifications are planned during the spring 2003 refueling outage (SL2-14)

The Unit 1 Train B containment fan cooler (CFC) HVS-1C is the bounding CFC due to its higher elevation and more severe loss-of-coolant-accident (LOCA) containment response. Based on preliminary analysis, the EDG load block timing change is expected to resolve the waterhammer issue with respect to Unit 2 CFCs and resolve Unit 1 Train A CFC waterhammer issues. The Train B CFC HVS-1C results are problematic and limited voiding may still occur with the EDG load block change.

To reduce modeling uncertainty for the time-to-boil and void size calculations, FPL is evaluating the ability to benchmark the hydraulic model against CFC flow and pressure responses measured during CCW pump stop and restart transients. The benchmarking data would be obtained, where feasible, during the upcoming Unit 1 fall 2002 outage (SL1-18) to support completion of the final GL 96-06 evaluation.

FPL will complete the evaluation and response to the NRC by March 15, 2003. As the scope of work to complete the evaluation depends in part on the results of the benchmarking data obtained during SL1-18, FPL will keep the NRC Project Manager informed on the progress.

Should our final evaluation indicate piping support or other plant modifications are required for either unit, they would be completed by the subsequent outage to close out all GL 96-06 waterhammer issues.

- Unit 1: End of the spring 2004 refueling outage (SL1-19)
- Unit 2: End of the fall 2004 refueling outage (SL2-15)

FPL reviewed the existing functionality analysis and concluded the CCW trains in both plants remain operable. As the planned EDG load block changes will significantly reduce or eliminate CFC void volumes, the functionality analysis will also remain bounding for the modified plant configuration.

St. Lucie Units 1 and 2
Docket Nos. 50-335 and 50-389
L-2002-149 Attachment Page 3

Conclusions

FPL will complete the waterhammer evaluation and update the response to the NRC by March 15, 2003. For St. Lucie Unit 1, modifications to implement this approach will begin during the fall 2002 refueling Outage (SL1-18) and be completed during the spring 2004 refueling outage (SL1-19). For St. Lucie Unit 2, modifications to implement this approach will begin during the spring 2003 refueling outage (SL2-14) and be completed during the fall 2004 refueling outage (SL2-15). The functional evaluation reviews continue to demonstrate system operability.