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AUTH.NAME AUTHOR AFFILIATION
UTLEY,E.E. Carolina Power & Light Co.
RECIP.NAME RECIPIENT AFFILIATION
VARGA,S.A. Operating Reactors Branch 1

SUBJECT: Provides info re steam generator chemistry control at facility, in response to NRC 801015 request. Condensers will be retubed w/stainless steel. Integral tubesheets will be installed to minimize circulating water & air leakage.

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CP&L
Carolina Power & Light Company

April 6, 1981

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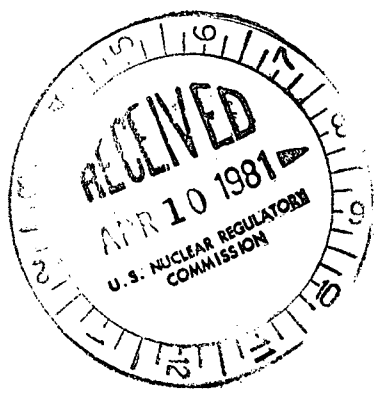
Office of Nuclear Reactor Regulation
ATTENTION: Mr. Steven A. Varga, Chief
Operating Reactors Branch No. 1
United States Nuclear Regulatory Commission
Washington, D. C. 20555



H. B. ROBINSON STEAM ELECTRIC PLANT UNIT NO. 2
DOCKET NO. 50-261
LICENSE NO. DPR-23
STEAM GENERATOR CHEMISTRY CONTROL

Dear Mr. Varga:

Summary

At the request of your staff, Carolina Power & Light Company (CP&L) met with them on October 15, 1980 to discuss the results of the inspection of the H. B. Robinson steam generators during the fall 1980 outage. During the meeting, your staff asked for information related to steam generator (S/G) chemistry control and improvements implemented or planned to be implemented. A description of our program and improvements is outlined below.

Brief Description of Existing Steam Generator Chemistry Control Program

The current general S/G Chemistry Control program consists of coordinated phosphate treatment utilizing disodium phosphate and trisodium phosphate addition in order to maintain a Marcy-Halstead ratio between 2.3 and 2.7. Also, cyclohexylamine is added for pH control and hydrazine is added for oxygen control.

Improvements Implemented Since Initial Operation

The plant was initially operated on trisodium phosphate addition only but this was subsequently changed to coordinated phosphate addition with routine monitoring of the Marcy-Halstead ratio.

Improvements have also been made over the operating period in the areas of condenser water inleakage. Prior to 1973, water inleakage was not regarded as a significant problem and condenser repairs were made only during scheduled outages or forced outages due to other plant problems. From 1973 to 1977, more attention was given to water inleakage and a limit of 20 gpm was established.

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Inleakage in excess of 20 gpm was considered significant and plant power reductions were considered for condenser repairs depending on the severity of the leakage and the system load requirements. Since 1977, plant load reductions have been made for condenser repairs, if possible, when inleakage approached 10 gpm. The recent purchase of a Freon Detection System for identification of condenser water and air leaks will aid in the reduction of both these problems.

A general improvement in the attention given to S/G chemistry has occurred since the early years of operation. When chemistry limits are exceeded, the problem is addressed and the chemistry is brought back to within limits more quickly than in the past.

Recent improvements made in the control of plant S/G chemistry will further reduce the incidence of certain types of tube degradation. The limits governing phosphate levels in the S/Gs have been changed in order to decrease the amount of phosphate stored in the S/Gs and minimize the possibility of free caustic occurring. Also, the addition of hydrazine in the turbine crossover piping to the low pressure stage was initiated to minimize metals transport to the S/Gs, as recommended by a 1980 EPRI study.

Two steam generator boils were performed during the past refueling outage, one during plant cooldown at approximately 212°F and one during plant heat-up at approximately 400°F. The cooldown boil was performed to loosen the sludge in the steam generator in order to improve the efficiency of sludge lancing. The heat-up boil was performed to remove suspended solids, phosphates, and chlorides which had not been removed by sludge lancing.

The heat-up boil procedure consists of raising the RCS temperature to 400°F and holding for 48 hours while maximizing blowdown. The boil is performed at 400°F due to the increased solubility of phosphates and chlorides at this temperature.

During the October 1980 boil, significant quantities of chlorides, phosphates, and suspended solids were removed from the steam generators.

Future Improvements

Planned future improvements include retubing of the plant condensers with stainless steel tubing and the installation of integral tubesheets to minimize circulating water and air leakage. In addition, four heaters in the feedwater train will be retubed with stainless in the near future. These efforts will significantly reduce the quantity of copper alloys in the secondary system.

Other improvements being evaluated include the addition of a forced air decarbonizer to the Secondary Water Make-up System and the addition of a bladder, a nitrogen blanket or a steam sparger to the condensate storage tank for oxygen control.

Conclusion

The chemistry program has been changed significantly over the life of the plant in order to minimize S/G tube degradation and future changes will be planned and implemented as necessary as more information becomes available on current S/G problems.

It is believed that the information provided above adequately addresses all of your staff's questions. If you have any additional questions regarding this subject, please contact my staff.

Yours very truly,

E. E. Utley
Executive Vice President
Power Supply and
Engineering & Construction

EVP/SDF/jc (3542)

cc: Mr. J. D. Neighbors