

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

BRUNSWICK STEAM ELECTRIC PLANT UNIT 2

FEEDWATER SPARGER REPLACEMENT DEFERRAL

INTRODUCTION

By letter dated October 7, 1981 (Serial: No. 81-1652), Carolina Power & Light Company (CP&L) committed to perform the feedwater sparger replacement and nozzle cladding removal recommended by NUREG-0619 during the current Unit 2 refueling outage. Carolina Power & Light Company has requested by letter dated June 1, 1984 to defer this work pending resolution of the feedwater sparger cracking issue at Northern States Power Company's Monticello Nuclear Generating Plant.

DISCUSSION AND EVALUATION

The replacement of the feedwater spargers and removal of the feedwater nozzle cladding on Unit 2 was scheduled to be completed during the current refueling outage; however, during recent inspections at Monticello, cracks were discovered in the feedwater spargers. The replacement spargers intended to be used at Brunswick are similar in design to those used at Monticello and, therefore, may be susceptible to the same cracking mechanism. An initial metallurgical analysis, performed by General Electric, indicates the cracks in the Monticello spargers are the result of high cycle fatigue; however, the actual mechanism which causes the cracking is still under evaluation. The anticipated schedule for completion of the analysis and identification of corrective actions does not support replacement of the Brunswick Unit 2 feedwater spargers prior to resolution of the new cracking phenomenon is premature and does not warrant the radiation exposure or the resource commitment required to complete the work.

A direct visual examination of the existing Brunswick Unit 2 feedwater spargers has been completed. This examination revealed some flow hole cracks ranging from 0.200 inches to 0.500 inches in length. A propagation analysis performed by General Electric for the cracks in the existing Brunswick Unit 2 feedwater spargers indicates the cracks could propagate up to a total of 1.3 inches in length during the next cycle of operation. However, cracks in the range of 1.3 inches are acceptable since the feedwater sparger is not a safety-related item, and there is no effect on the vessel system pressure boundaries. The crack areas are small and will not affect feedwater flow distribution. The potential for loose parts is not a concern due to the orientation of the cracks.

As a result of not replacing the feedwater spargers, the cladding removal from the feedwater nozzles will not be performed this outage. The following nondestructive examinations were performed on the feedwater

nozzle with no adverse indications:

- 1) Liquid penetrant testing of the accessible portions (approximately 80%) of the feedwater nozzle internal blend radii. The accessible area includes the lower portion of the blend radius which has the highest susceptibility to cracking.
- 2) Ultrasonic testing of the feedwater nozzle external blend radii.
- 3) Ultrasonic testing of the feedwater nozzle safe end forgings.

Carolina Power & Light Company's October 7, 1981 submittal also provided a schedule for rerouting the reactor water cleanup piping to each feedwater line and evaluation of the feedwater low-flow controller. Carolina Power & Light Company is still evaluating these two items and will provide their status and schedule in a separate submittal.

#### CONCLUSION

Based on the results of the inspections, we have determined that deferral of the feedwater sparger replacement and removal of the feedwater nozzle cladding does not represent a safety concern. Hence, CP&L's plans to defer this work until the next refueling outage for Unit 2 (currently scheduled to begin April 19, 1986) contingent upon satisfactory and timely resolution of the sparger cracking issue at Monticello is acceptable.

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Dated: