CP&L

Carolina Power & Light Company

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SERIAL: NLS-91-026

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Senior Vice President
Nuclear Generation

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

BRUNSWICK STEAM ELECTRIC PLANT, UNIT NO. 1
DOCKET NO. 50-325/LICENSE NO. DPR-71
UNIT 1 DRYWELL FIRE EVALUATION

Gentlemen:

On December 3, 1990, Brunswick Steam Electric Plant, Unit No. 1 experienced a fire in the Drywell Personnel Airlock as identified in Licensee Event Report 1-90-026. Carolina Power & Light Company (CP&L) has performed a comprehensive assessment of the fire and its effect on the plant systems/components that could have been affected by that fire.

The following is a brief assessment of the areas evaluated:

1. Drywell Personnel Airlock/Penetration

   Superficial Damage to Internal Components and Paint

   No reduction in structural design margin was incurred to either the airlock barrel or doors. Hardness testing was conducted in the most heavily damaged areas as exhibited by the destruction of the painted coating. Tests indicated that the hardness is within the acceptable range for SA-516 Grade 70 material and is not different from those areas of the airlock where the paint had not peeled due to heat.

   Airlock barrel to drywell seals were tested (LLRT) and found to be undamaged.

   Inner (drywell side) door seals were found to have suffered minor damage and were replaced. Testing (LLRT) of the replaced seals was performed with acceptable results.

   Slight warpage was identified in the top of the airlock penetration which has been determined not to affect the ability of the airlock to seal, as verified by successful LLRT of the seals.

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2. Drywell Integrity

The heat envelope within the drywell consisted of an area extending approximately 2 feet to each side of the airlock opening and up to 10-15 feet above the opening and extended into the drywell only 3-5 feet out from the drywell wall. This boundary is evident by the presence of undamaged paper tags and thin plastics utilized throughout the adjacent area.

Liner Plate

Most of the smoke was drawn directly upwards from the heat-affected area along the surface of the drywell wall to the top of the drywell.

No reduction in the structural design margin was incurred. Hardness testing was conducted in those areas (immediately above the airlock penetration) which exhibited the heaviest buildup of smoke. The areas tested indicated hardness within the acceptable range for SA-516 Grade 70 material. Missing paint was used as an indicator of peak temperatures reached during the fire; and because no appreciable damage to the paint on the drywell liner could be observed, it was concluded that the maximum temperature was less than 400°F, which is the peeling limit reported by the paint manufacturer.

Concrete

The heat generated by the fire (calculated less than 400°F) was not of sufficient magnitude or duration to cause any reduction in structural design margin on the concrete in the localized area. Minor external spalling around the penetration has been determined to be nonstructural.

3. Drywell Components/Systems

Drywell mechanical/electrical components other than the airlock suffered no damage from the fire. The predominant and most directly impacted equipment in this area were electrical penetrations 1X-101D and 1X-101F, which are located directly above the airlock opening. This is in the path of the most intense heat and smoke. The covers were removed from these penetrations to allow inspection for fire-related damage. No damage was observed.

As a conservative measure, equipment in the near vicinity of the airlock opening was also inspected. This equipment consisted of inboard MSIVs, recirc pump motor 1B, SRM/IRM drive boxes, CRD insert/withdraw lines--all within approximately 25 feet of the airlock opening. SRVs H, A, and F, which were the closest SRVs to the fire area, were inspected. No damage was noted.

The smoke which permeated the atmosphere of the drywell, deposited a mostly light (heaviest at the airlock) coating of soot, on virtually everything in the drywell. This soot contained high levels of chlorides, which were removed as soon as possible.

The highest chloride concentrations identified in the drywell were 510 $\mu g/in^2$. CP&L designated 5.2 $\mu g/in^2$ as the acceptable limit for chlorides in the drywell on austenitic and duplex stainless steels and nickel alloys (this was the same limit established at the Browns Ferry Nuclear Power Plant). Following the cleanup of the drywell, the highest chloride level identified was 4.67 $\mu g/in^2$, which was located on a carbon steel main steam line.

Some of the chrome plate on the shafts of snubbers in the drywell also showed signs of minor pitting (soot) from the fire. The "worst case" snubbers were removed and functionally tested, with acceptable results. The shafts from these snubbers were then sent to CP&L's laboratory for analysis. Analysis determined that, with proper cleaning, the snubbers would be acceptable for continued use based on the acceptable results of the functional tests. Snubber shafts were cleaned, and the snubbers are acceptable for continued use.

The assessments/evaluations performed for the safety systems that could have been affected by the fire conclude that no safety concerns exist and that unit restart is acceptable.

Should you have any questions regarding this matter, please contact Mr. S. D. Floyd at (919) 546-6901.

Yours very truly,

R A Watson

R. A. Watson

DBB/jbw (975BNP)

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