

# The Light company

Houston Lighting & Power

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

South Texas Project Electric Generating Station  
Units 1 & 2  
Docket Nos. STN 50-498 and STN 50-499  
Leakage of Aluminum-Bronze Essential Cooling Water System

On April 1, 1988 Houston Lighting & Power Company (HL&P) operations personnel at the South Texas Project Electric Generating Station (STPEGS) Unit 1 observed slight leakage occurring at a number of locations in the aluminum-bronze Essential Cooling Water (ECW) system. This discovery has resulted in an intensive effort to determine the scope of the problem, its root cause and the necessary corrective actions.

Some small bore (2 inch and under) fittings and valves in the ECW system at STPEGS Unit 1 have undergone crevice corrosion (dealloying) extensive enough to have resulted in through wall seepage. Leaking components found prior to the beginning of the current outage and certain of the higher stressed small bore fittings and valves will have been replaced before resumption of operation.

Although destructive examinations have shown that small bore fittings and valves that had shown no sign of seepage have experienced varying degrees of crevice corrosion, data from extensive metallographic examinations have been combined with stress analyses, structural evaluations and estimates of the rate of dealloying to provide confidence that these components have substantial margins and will not fail as the result of postulated load combinations.

Failure analyses have shown that due to its ductile behavior and the low design stresses, aluminum-bronze will not undergo brittle failure. Furthermore, the components have substantial margins on a plastic limit load basis. Safety analyses demonstrate that the effects of leakage associated with the dealloying will not compromise the ability of the Essential Cooling Water system to accomplish its safety function. Further, the consequences of assumed failures have been found to be bounded by design basis calculations previously performed to evaluate postulated flooding and spray effects.

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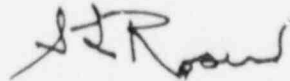
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Although there is no evidence of any leakage from aluminum-bronze components larger than 2 inches, a destructive examination of an 8 inch cast aluminum bronze butterfly valve and an in-place examination of the crevice area behind a backing ring on an 8 inch cast weld neck flange have been conducted. The destructive examination on the butterfly valve confirmed that the depth of crevice corrosion is similar to that observed on the small bore components. The in-place examination in the crevice area behind the backing ring on the 8 inch weld neck flange showed only shallow dealloying.

Taken together, these examinations and analyses provide the basis for our confidence that STPEGS Unit 1 can be operated without undue risk to the health and safety of the public. Nevertheless, HL&P is working towards a more permanent solution for small bore fittings and valves. HL&P will have this solution in hand in time to be implemented prior to fuel loading in Unit 2. This schedule would support implementation of the more permanent corrective action prior to the return to service of Unit 1 after its first refueling outage.

If you should have any questions on this matter, please contact me at (512)972-7138.



S.L. Rosen  
General Manager  
Operations Support

MAM/jks

- Attachments:
1. HL&P Report on Evaluation of the ECW System at STPEGS
  2. Bechtel Report on Failure Analysis and Structural Integrity Evaluation of Leaking Aluminum-Bronze Cast Valve Bodies and Fittings in the ECW System

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