



Portland General Electric Company

James E. Cross Vice President, Nuclear

September 7, 1990

Trojan Nuclear Plant  
Docket 50-344  
License NPF-1

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

Dear Sirs:

Containment Air Cooler (CAC) Flaw Analysis

During May 1990, a flaw analysis was performed for Portland General Electric Company to support the continued service of the CACs until the 1991 Refueling Outage. Three CAC cooling coil header piping joints previously exhibited through-wall leakage which is attributed to poor brazing techniques during construction. The leakage of one of the piping joints has been corrected by isolating the affected cooling coil. The leakage of the other two piping joints has been corrected temporarily by the installation of stainless steel enclosures which were injected with a nuclear-grade leak-sealing compound. The flaw analysis takes no credit for additional structural support that may be provided by the leak repairs.

The CAC cooling coil headers are made of 90-10 cupronickel alloy piping with brazed joints. Trojan is presently in the second ten-year inservice inspection interval with the 1983 Edition through Summer 1983 Addenda of Section XI applicable to the CACs. However, because no Editions of Section XI provide explicit rules for evaluating flaws in cupronickel alloys, guidance from the 1989 Edition of Section XI, Subsubarticle IWB-3640, "Evaluation Procedures and Acceptance Criteria for Austenitic Piping", is used to show acceptability of the flawed piping compared to code safety margins. The use of rules for evaluating flaws in austenitic stainless steel as guidance for this flaw analysis is appropriate because of similar mechanical behaviors with regard to the high degree of ductility and large capacity to strain-harden under load. In the evaluation, the specified minimum mechanical properties for 90-10 cupronickel alloy are substituted for the mechanical properties of austenitic stainless steel.

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The flaw analysis of the CAC cooling coil header piping joints is enclosed for your review as discussed with Messrs. Larkins and Trammell of the Nuclear Regulatory Commission staff. Conclusion Number 1 of the analysis is that there is a greater safety margin than is required by ASME Section XI for flaw acceptance in piping components. Please contact me if there are any questions concerning the analysis.

Sincerely,

*James E. Cross*

Enclosure

c: Mr. John B. Martin  
Regional Administrator, Region V  
U.S. Nuclear Regulatory Commission

Mr. David Stewart-Smith  
State of Oregon  
Department of Energy

Mr. R. C. Barr  
NRC Resident Inspector  
Trojan Nuclear Plant