

Reportable Deficiency and Corrective Action  
WPPSS NUCLEAR PROJECT NO. 2  
Possible Violation of Primary Containment  
After a Penetration Weld Failure

WASHINGTON PUBLIC POWER SUPPLY SYSTEM  
DOCKET NO. 50-397  
License No. CPPR-93

Description of Deviation

The design of all Primary Containment instrument penetrations consists of stainless steel instrument piping penetrating one inch thick carbon steel penetration end caps. Fillet welds are provided between the piping and the end cap on both sides of the end cap. Due to the difference in thermal expansion between stainless and carbon steel, the penetrations will experience thermal stresses during operation, the magnitude of which is proportional to penetration temperature.

Fatigue analyses have been performed on all instrument penetrations. All but one will experience less fatigue cycles than the code allowable over the 40 year plant design life. The one remaining penetration (X69D) contains the RPV sample line. It is anticipated that this line will be in constant intermittent use (sampling at least once per day over the 40 year plant design life), and thus the number of thermal cycles under "Normal" design conditions will exceed the fatigue life permitted by code. Weld failure is postulated thus causing a breach in Containment which could lead to an increase in the radiation dose to the public beyond the levels estimated in the event of a LOCA.

Safety Implication

As stated, the postulated failure of the penetration weld would cause a breach of Containment and an increase in the radiation dose to the public in the event of a LOCA. The potential increase in dose was considered to be a substantial safety hazard.

Corrective Action

Penetration X69D will not be used for the RPV Sampling Line. A penetration capable of withstanding the expected number of thermal cycles over the forty year life will be designed and installed.

