

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION  
OF A REQUEST FOR RELIEF FOR A NON-CODE REPAIR  
AT CRYSTAL RIVER, UNIT NO. 3  
DOCKET NO. 50-302

1.0 BACKGROUND

In early December 1995, Florida Power Corporation (FPC) discovered a leak in piping which forms part of the Crystal River Unit 3 Emergency Feedwater System. This piping provides a recirculation flow path from the emergency feedwater pumps to the Emergency Feedwater Tank (EFT), and provides a minimum flow path for pump protection during delivery of emergency feedwater. The leak is located in a normally buried section of ASME Section III, Class 3, 1½" carbon steel piping, approximately one-hundred feet from the EFT. The leak results from a through-wall flaw located on the exterior surface of the pipe. The root cause of this flaw appears to be corrosion through contact with the soil.

By letter dated December 11, 1995 (Reference 1), FPC requested relief from the repair requirements of the ASME B&PV Code, Section XI. This leak cannot be isolated to implement a code repair during plant operation. A code repair would require the removal of the Emergency Feedwater safety function for approximately 24 hours, or the shutdown/cool-down of the plant to Mode 5. The staff provided verbal approval of your request on December 21, 1995. This written evaluation documents the bases for the staff's approval.

2.0 EVALUATION

In the referenced letter, FPC proposed the use of ASME Section XI Code Case N-523 (Reference 2) to implement a temporary non-Code repair. The staff has identified some deficiencies in this Code Case, and has therefore not fully endorsed it. The repair consists of an engineered mechanical clamp placed over the defective area containing the through-wall flaw. Such repairs have previously been approved at other plants on a case-by-case basis.

The design of the clamp is based on the system operating temperature and pressure (150°F and 310 psig, respectively), in accordance with the design requirements of ASME Code Case N-523. The clamp is fabricated from A-36 carbon steel flat plate stock. FPC provided detailed stress calculations and showed that the clamp parts and the bolt meet the ASME Section III Class 3 allowable stresses for these components. The staff has reviewed these calculations and has found them reasonable and in accordance with current engineering practice.

Since the flaw is in a section of buried piping, it has to be uncovered to permit the repair, thus losing the continuous support of the soil. FPC performed a stress evaluation of the uncovered pipe segment with the additional mass of the engineered mechanical clamp. The evaluation considered all design-basis loading conditions and load combinations, including deadweight, the design pressure, and the seismic loading. Based on an uncovered length of 18 feet, FPC demonstrated that the maximum calculated stress under the combined loading was within the ASME Section III Class 3 code allowable. The staff has reviewed these calculations and has also found them reasonable and in accordance with current engineering practice.

FPC committed to install the temporary non-code repair under procedures designed to preclude excessive loading on the piping, and to provide adequate precautions to minimize hazards to plant personnel. The clamping device will be monitored for leakage at least weekly. The staff finds this acceptable.

### 3.0 CONCLUSION

Pursuant to 10 CFR 50.55a(a)(3)(i), the staff finds that the temporary non-code repair proposed and implemented by FPC provides an acceptable level of quality and safety until a code repair can be performed in that it will provide adequate assurance of piping integrity and leak tightness. The staff concludes that the alternative to the Code requirements is acceptable until the next entry into Mode 5, of sufficient duration to perform a code repair, but no later than the next scheduled refueling outage, Refuel 10, which commenced on February 16, 1996.

The staff's conclusion was provided verbally to FPC on December 21, 1995.

### 4.0 REFERENCES

1. Letter of December 11, 1995, from G. L. Boldt, Florida Power Corporation, to the USNRC Document Control Desk.
2. ASME Boiler and Pressure Vessel Code, Section XI, Division 1, Code Case N-523 "Mechanical Clamping Devices for Class 2 and 3 Piping."