ENCLOSURE

SAFETY EVALUATION REPORT
SURRY POWER STATION UNIT 2, DOCKET NUMBER 50-281
REQUEST FOR RELIEF FROM ASME SECTION XI
HYDROSTATIC TEST REQUIREMENTS FOR WELD REPAIRS

INTRODUCTION

This report provides a safety evaluation of a request for relief from a specific hydrostatic testing requirement applicable to a post repair examination on Surry Unit 2 main steam system piping. The request was submitted by Virginia Electric and Power Company (the licensee) in a letter dated December 9, 1983. Additional information relevant to the request was provided to the NRC in a letter from the licensee dated August 17, 1984, and in discussions held during NRC Inspection 280, 281/84-29 (conducted September 24 - 27, 1984).

The bases for the requirements from which relief has been requested and for granting the relief are derived from the Code of Federal Regulations, 10 CFR 50.55 a(g). The subject regulations specify that inservice examinations and tests be performed on nuclear power facilities, such as Surry Unit 2, in accordance with the requirements of Section XI of the ASME Boiler and Pressure Vessel Code (ASME Section XI). ASME Section XI provides requirements for hydrostatic testing of piping after repairs and replacements. 10 CFR 50.55 a(g)(6)(i) states that the Commission may grant relief from the ASME Section XI requirements when they are determined impractical for a facility, provided the Commission determines that the granting of the relief is authorized by law, will not endanger life or property or the common defense and security and that it is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility. The specific ASME Section XI requirements from which relief has been requested; the relief requested; the basis for the relief request; and the NRC staff's evaluation and conclusions are described below.

ASME Section XI Requirements

ASME Section XI, Subsection IWA 4400(a) requires hydrostatic testing of ASME Class 2 piping repaired by welding. Subsection IWC-5000 provides criteria for determining the required test pressure for performing the post repair hydrostatic tests on the piping. For testing the welded repair installation of ASME Class 2 valve 2-MS-76 in Surry Unit 2 main steam system piping, the IWC-5000 criteria specify a test pressure of 1.25 times design pressure. The design pressure for the piping containing valve 2-MS-76 is 1085 psig and, thus, the test pressure is required to be 1356 psig.

Relief Requested

The licensee requested relief to accept performance of the hydrostatic test of weld repairs in ASME Class 2 valve 2-MS-76 in the Unit 2 main steam system piping at 1210 psig, rather than the ASME Section XI required 1356 psig.

Basis For Relief Request

Valve 2-MS-76 is a 1½ inch ASME Class 2 main steam system valve that functions in a drain capacity. During a 1983 outage, the licensee performed a post-repair hydrostatic test on the valve using the nearest adjacent valves as the test boundary. In performing the test they were unable to obtain the required test pressure of 1356 psig due to internal leakage through test boundary valves, but they did reach a pressure of 1210 psig. They reported the circumstances of the test and basis for relief as follows:

> "An auxiliary feed pump (motor driven) was utilized to provide pressure for the hydrostatic test. This pump was successfully utilized in our steam generator hydrostatic test providing the required 1356 psig test pressure. The pump was placed in a recirculation mode with the test boundary pressurized using a hose connection (1") from a drain on the discharge side of the pump. Pressure was increased by limiting discharge flow in the main recirculation flow path. A maximum pressure of 1210 psig was reached. This corresponds to an available flow rate of approximately 330 gpm in the recirculation flow path. Actual flow rate through the one-inch hose connection was not measured; however, the discharge flow of the pump was limited to near shut-off conditions, directing the flow through the hose connection for the test. The large leak within the test boundary was entirely internal as no external leakage was located within the test boundary. The test boundary was limited to single valve closure. Normal hydrostatic test pumps have limited flow rates at high pressures and are unable to maintain pressure with significant leakage. The auxiliary feed pump provided high pressure at a high flow rate and provided the best pressure source available at the station. The boundary valves utilized in the test are exposed to an environment which can cause deterioration of the valve internals through several mechanisms; steam cuts, corrosion, etc. As no back-up isolation valves exist, complete pressurization of 'A' steam generator would be necessary to test the replaced valve at the required pressure."

The licensee also reported that they supplemented the code required testing with a surface examination (liquid penetrant) which revealed no indications, providing further confirmation of the adequacy of the repair.

NRC Staff Evaluation and Conclusions

In evaluating the licensee's request, the staff has taken into consideration the location, size and function of the involved piping; the alternate testing performed by the licensee; and the measures that would have been necessary to achieve the full specified test pressure. Based on its evaluation of these factors, the staff finds that the original test pressure requirement was impractical for the given situation and that granting of the requested relief is authorized by law, will not endanger life or property or the common defense and that it is otherwise in the public interest. The relief requested is hereby granted.