UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO RELIEF REQUEST CVCS RV-3

CAROLINA POWER & LIGHT COMPANY

SHEARON HARRIS NUCLEAR POWER PLANT, UNIT 1

DOCKET NO. 50-400

INTRODUCTION

By letter dated April 4, 1991, you requested relief from the exercising requirements of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code (Code) pursuant to 10 CFR 50.55a. Relief was requested from the IWV-3520 requirement of Section XI for check valve ICS-294 in the refueling water storage tank supply line to the charging pump supply header. You proposed to partial-stroke exercise the valve at cold shutdown and full-stroke exercise the valve at refueling.

DESCRIPTION AND DISCUSSION

Relief Request CVCS RV-3: The licensee has requested relief from the IWV-3520 requirement of Section XI of the ASME Code for check valve ICS-294 in the refueling water storage tank supply line to the charging pumps supply header and proposed to partial-stroke exercise during cold shutdown and full-stroke exercise this valve during refueling outages.

Licensee's Basis for Requesting Relief:

Verification of forward flow operability can only be performed by injecting refueling water storage tank water into the reactor coolant system (RCS). While at power, the charging pumps have insufficient head to overcome normal RCS operating pressure for a full-flow test. Partial-stroke exercising while at power would adversely affect RCS boron concentration and could lead to a reactivity transient.

Full forward flow verification at cold shutdown could result in a cold overpressurization of the RCS. The only time that there is sufficient RCS expansion volume is during refueling while the reactor vessel head is removed.

The valve will be partial-stroke exercised at cold shutdown and full-stroke exercised at refueling.

EVALUATION

Check valve ICS-294, in the line from the refueling water storage tank to the charging pump suction header, cannot be exercised quarterly during power operations because the only flow path to exercise this check valve with flow would supply water from the refueling water storage tank water, with high concentrations of boric acid, to the charging pump suction and then into the RCS, resulting in power fluctuations and possible plant shutdown.

It is impractical to full-stroke exercise this valve during cold shutdown because the RCS does not contain sufficient expansion volume to accomodate the flow required. Such a test could cause a low-temperature overpressure condition and damage RCS components. System modification would be needed before this valve could be full-stroke exercised quarterly or during cold shutdowns. This would be costly and burdensome to the licensee. The licensee's proposal to full-stroke exercise each refueling outage and part-stroke exercise each cold shutdown provides a reasonable alternative to the Code requirement.

Based on the determination that compliance with the ASME Code exercising requirements is impractical, and considering the burden on the licensee if those ASME Code requirements are imposed, relief may be granted as requested pursuant to 10 CFR 50.55a(g)(6)(i).

Principal Contributor: K. Dempsey

Date: August 13, 1991