CP&L

Carolina Power & Light Company
Harris Nuclear Plant
PO Box 165
New Hill NC 27562

SERIAL: HNP-00-173
10 CFR 50.55a

DEC 1 4 2000

United States Nuclear Regulatory Commission
ATTENTION: Document Control Desk
Washington, DC 20555

SHEARON HARRIS NUCLEAR POWER PLANT
DOCKET NO. 50-400/LICENSE NO. NPF-63
INSERVICE INSPECTION PROGRAM RELIEF REQUEST NO. CS-ROJ11
ALTERNATIVE TO ASME CODE SECTION XI, IWV-1100, PART 10 OF THE ASME OPERATIONS AND MAINTENANCE (OM) STANDARDS (OMa-1988 EDITION), AND USNRC GENERIC LETTER 89-04 ATTACHMENT 1, STAFF POSITION 2, USING NUREG 1482, GUIDELINES FOR INSERVICE TESTING AT NUCLEAR POWER PLANTS, PARAGRAPH 4.1.1

Dear Sir or Madam:

In accordance with 10 CFR 50.55a(a)(3)(ii), Carolina Power & Light Company (CP&L) requests relief for the Harris Nuclear Plant (HNP) from the 1989 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code Section XI, IWV-1100, Part 10 of the ASME Operations and Maintenance (OM) Standards (OMa-1988 edition) and NRC Staff Position 2 in Attachment 1 of USNRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs. HNP proposes to invoke NUREG 1482, Guidelines for Inservice Testing at Nuclear Power Plants, paragraph 4.1.1. Specifically, relief is requested as required for testing check valves in a series pair in lieu of testing the valves individually.

Relief is requested from performing individual bi-directional inservice testing of series check valves associated with two applications. The first application is located in the Chemical Volume Control System (CVCS) Seal Injection piping lines to the Reactor Coolant Pumps. The second application is located in the CVCS Alternate Charging, Normal Charging, and Pressurizer Auxiliary Spray Injection piping lines to the Reactor Coolant System. The subject valves are located inside the primary containment.

An alternative to the testing requirement is proposed in the enclosed Relief Request #CS-ROJ11. Disassembly or radiography of the subject in-series check valves would pose workers to additional hazards both in the industrial safety and radiological areas while also creating schedule hardships without a compensating increase in the level of quality and safety. For this reason, CP&L requests relief from testing the subject valves individually. CP&L requests approval within a time frame to support use during the next Refueling Outage (RFO10) scheduled to begin September 2001.

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Please refer any question regarding this submittal to Mr. E. A. McCartney at (919) 362-2661.

Sincerely,

R.J. Field
Manager, Regulatory Affairs

MGW

Enclosure

c: Mr. J. B. Brady (NRC Senior Resident Inspector, HNP)
Mr. Rich Laufer (NRR Project Manager, HNP)
Mr. L. A. Reyes (NRC Regional Administrator, Region II)

Enclosure to SERIAL: HNP-00-173

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COMPONENT(S) FOR WHICH RELIEF IS REQUESTED:

Chemical Volume and Control System Seal Injection To Reactor Coolant Pump In-Series Check Valves & Chemical Volume and Control System Alternate Charging, Normal Charging, and Pressurizer Auxiliary Spray Injection In-Series Check Valves; 1CS-348, 1CS-349 (Seal Injection RCP 1A), 1CS-389, 1CS-390 (Seal Injection RCP 1B), 1CS-430, 1CS-431 (Seal Injection RCP 1C), 1CS-486, 1CS-483 (RCS Alternate Charging Line), 1CS-500, 1CS-497 (RCS Normal Charging Line), & 1CS-491, 1CS-488 (RCS Pressurizer Auxiliary Spray Injection Line).

CODE REQUIREMENT(S):

Harris Nuclear Plant (HNP) is committed to implement it's IST program in accordance with the 1989 Edition of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI. The 1989 Edition of ASME Section XI, IWV-1100 requires valve testing be performed in accordance with the requirements stated in ASME/ANSI OM (Part 10).

ASME/ANSI OM (Part 10)
Paragraph 4.3.2.2 'Exercising Requirements' states that valves shall be exercised as follows:

(a) During plant operation, each check valve shall be exercised or examined in a manner which verifies obturator travel to the closed, full-open or partially open position required to fulfill its function.
(b) If full-stroke exercising during plant operations is not practicable it may be limited to part-stroke during plant operation and full-stroke during cold shutdowns.
(c) If exercising is not practicable during plant operation, it may be limited to full-stroke exercising during cold shutdowns.
(d) If exercising is not practicable during plant operation and full-stroke during cold shutdowns is also not practicable, it may be limited to part-stroke during cold shutdowns, and full-stroke during refueling outages.
(e) If exercising is not practicable during plant operation or cold shutdowns, it may be limited to full-stroke during refueling outages.
(f) Valves full-stroke exercised at shutdowns shall be exercised during each shutdown, except as specified in (g) below. Such exercise is not required if the time period since the previous full-stroke exercise is less than 3 months.
(g) Valve exercising shall commence within 48 hr of achieving cold shutdown, and continue until all testing is complete or the plant is ready to return to power. For extended outages, testing need not be commenced in 48 hr provided all valves required to be tested during

cold shutdown will be tested prior to plant startup. However, it is not the intent of this Part to keep the plant in cold shutdown in order to complete cold shutdown testing.

(h) All valve testing required to be performed during a refueling outage shall be completed prior to returning the plant to operation.

Paragraph 4.3.2.4 'Valve Obturator Movement' states:

(a) The necessary valve obturator movement shall be demonstrated by exercising the valve and observing that either the obturator travels to the seat on cessation or reversal of flow, or opens to position required to fulfill its intended function. Observation may be by observing a direct indicator such as a position indicating device, or by other indicator(s) such as changes in system pressure, flow rate, level, temperature, seat leakage testing, or other positive means.

(b) If a manual mechanical exerciser is used to move the obturator, the force or torque required to initiate movement (breakaway) shall be measured and recorded. The breakaway force shall not vary by more than 50% from the established reference value. The reference value used shall be the value obtained when the valve is known to be operating properly and shall be taken under conditions as close as practicable to the conditions under which the valve will be tested, e.g., wet vs. dry, equivalent static head, etc.

(c) As an alternative to the testing in (a) or (b) above, disassembly every refueling outage to verify operability of check valves may be used.

USNRC Generic Letter 89-04, Guidance on Developing Acceptable Inservice Testing Programs, Attachment 1, Staff Position 2, Alternative to Full Flow Testing of Check Valves states:
The NRC staff position is that valve disassembly and inspection can be used as a positive means of determining that a valve's disk will full-stroke exercise open or of verifying closure capability, as permitted by IWV-3522. If possible, partial valve stroking quarterly or during cold shutdowns, or after reassembly must be performed.

CODE REQUIREMENT FROM WHICH RELIEF IS REQUESTED:

Relief is requested from ASME/ANSI OM (part 10) Paragraph 4.3.2.4.(c): As an alternative to the testing, disassembly every refueling outage to verify operability of check valves may be used.

BASIS FOR REQUESTING RELIEF:

NUREG 1482, Guidelines for Inservice Testing at Nuclear Power Plants, Section 4.1.1, describes plants having piping configurations which include two check valves in series with no provision (such as intermediate test taps) for verifying that each valve can close. Additionally, the section's *NRC Recommendation* states "If the licensee has no practical means for verifying the ability of each valve in a series to close, it may review the plant safety analysis to determine if both valves are required to function. If only one of the two valves is credited in the safety analysis (that is, if one valve could be removed without creating an unreviewed safety question or creating a conflict with regulatory or license requirements), then verification that the pair of valves is capable of closing is acceptable for IST. If relief is requested on this basis, both series check valves must be included in the IST program and be subject to equivalent quality assurance criteria."

NUREG 1482 Section 4.1.1 lists several *conditions* that must be satisfied in order to test Series Check Valves. These *conditions* are 1) no practical means for verifying the ability of each valve in a series to close (piping configuration), 2) a review of the plant safety analysis to determine that both valves are not required to function, 3) Series Check Valves must be included in the IST program, and 4) valves are subject to equivalent quality assurance criteria.

Condition 1
Piping designs associated with Chemical Volume and Control System Seal Injection To Reactor Coolant Pump In-Series Check Valves have no provisions (such as intermediate taps) for verifying that each valve can close. Piping designs associated with Chemical Volume and Control System Alternate Charging, Normal Charging, and Pressurizer Auxiliary Spray Injection In-Series Check Valves do have an intermediate tap between the two check valves. However, HNP has determined that these taps are not adequate for testing the valves individually. A combination of the surveillance test methodology, questionable results, and possible plant impacts provided the basis for this determination. The factors include:

> The surveillance test requires a refueling outage. These valves are comprised of either simple swing or spring assisted check valves each mounted horizontally. Back pressure is provided only by the refueling cavity level. The static head pressure is minimal due to plant piping configuration. To pressurize the second valve away from the refueling cavity, a pressurized fluid below that being exerted by cavity static head pressure on the first valve would have to be introduced through the tap between the two valves. This pressure would be low (~5psi).
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> The fluid introduced by the test methodology described above would introduce diluted water or air into the Reactor Coolant System. Diluted water would be required to be of the same borated dilution level as the cavity to prevent RCS dilution. To prevent any thermal cyclic issues, the water introduced by the surveillance test would be required to be equal to that of the piping system under test.
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> The set-up required to perform this test would involve elevated radiation fields, which conflicts with the effort to reduce radiography used as the current test method. The increased burden (i.e. the extensive test set-up and additional actions to prevent these unwanted test issues) is not justified by a compensating increase in level of quality and safety.

There are provisions for verifying that at least one of the valves in each pair of the subject in-series check valves is closed. These provisions are located upstream of the subject check valves.

Condition 2
The following plant document excerpts support the plant safety analysis requirement that both valves are not required to function.

> HNP Final Safety Analysis Report Figure 3.6.1-1, Loss Of Reactor Coolant Accident Boundary Limits, establishes the Case III (incoming lines) accident boundary as the second of two check valves in series. This figure also has a note "The Reactor Coolant

Pump No. 1 seal is assumed to be equivalent to first valve." In the case of the Seal Injection RCP check valves, this note adds additional credence to testing the valves as a unit. The seal acts as an additional restriction similar to the function provided by the check valves.

Westinghouse Systems Standard Design Criteria SS 1.19, Revision 0, March 1978, Criteria For Protection Against Dynamic Effects Resulting From Pipe Rupture, Section 2 - Reactor Coolant System Branch Pipe Rupture, Section 2-2-1, Loss of Reactor Coolant Accident Boundary Limits states "In particular, a loss of reactor coolant is assumed to occur for a pipe break down to the restraint of the normally open automatic isolation valve (case II) on outgoing lines and down to the second check valve (case III) on incoming lines. A pipe break beyond the restraint or second check valve will not result in an uncontrolled loss of reactor coolant if either of the two valves in the line close." Section 2-2-1 further states "This criterion takes credit for only one of the two valves performing its intended function".

Condition 3
The subject twelve valves are included in the HNP IST Program Plan HNP-IST-002 – 2nd Interval.

Condition 4
The subject twelve valves are ASME Class 1 valves, which are subject to the plant quality assurance criteria.

Eight of the subject valves have welded bonnets that do not support disassembly. Valve 1CS-497 has a cap welded over the bonnet, thus, making disassembly difficult. Valves 1CS-483, 1CS-486, and 1CS-500 have a bolted bonnet. Valve disassembly would pose workers to additional hazards both in the industrial safety and radiological areas while also creating schedule hardships.

During the last Refueling Outage (RFO9), these valves' closed positions were verified by the use of radiography with satisfactory results. Operational surveillance tests were conducted to verify valve stroke close requirements. The use of radiography poses workers to high radiation fields and this activity has routinely resulted in 0.5 to 1.0 Rem of radiation dose. Large scale radiography increases the risk of boundary violations and associated hazards due to the Containment Building layout. Additionally, schedule hardships are incurred due to the sizable radiography boundaries, which will halt other work activities in the area.

ALTERNATIVE TESTING:

Upon approval of this Relief Request (CS-ROJ11), HNP will test the subject check valves using a test method which will verify that the pair of valves is capable of closing as a unit. This methodology is as specified by NUREG 1482. Additional actions would be imposed if testing identified that the closure capability of the pair of valves is questionable. If so, both valves would be declared inoperable and corrective actions taken for both valves, as necessary, before being returned to service.

CP&L requests approval of this relief request within a time frame to support use during the next Refueling Outage (RFO10) scheduled to begin September 2001.