123 Main Street
White Plains, New York 10601
914 681 6240

NewYorkPower Authority

John C. Brons
Senior Vice President
Nuclear Generation

July 14, 1988
JPN-88-033

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D.C. 20555

SUBJECT: James A. FitzPatrick Nuclear Power Plant
Docket No. 50-333
Request for Exemption from Containment
Integrated Leak Rate Test - Retest Schedule

Reference: NYPA letter, J. C. Brons to the NRC, dated April 8, 1988 (JPN-88-012), regarding the same subject.

Dear Sir:

The referenced letter requested an exemption from the requirements of 10 CFR 50 Appendix J §III.A.6(b), to restore the normal Integrated Leakage Rate Test (ILRT) retest schedule of Section III.D(a). Attachment II to that letter contained a Corrective Action Plan (CAP) as technical justification for the exemption request.

As part of that CAP, 33 containment isolation valves (CIVs) are to be replaced (21 of these during the 1988 refueling outage). Three of the valves scheduled for replacement during the 1988 refueling outage are the two RHR containment spray inboard CIVs (10-MOV-31A and 31B) and the HPCI turbine exhaust manual isolation valve (23-HPI-11). Due to the piping configuration, the welds attaching the inboard side of these valves to their respective containment penetrations cannot be pressure tested as required by Appendix J §IV.A without performing an ILRT.

In a July 6, 1988 telecon, the NRC staff requested that the Authority provide a detailed discussion as to why local leak rate tests (LLRT) cannot be performed on the inboard weld attaching these three valves. This information is contained in the attachment to this letter.

The Authority hereby amends the request for exemption from Appendix J, submitted with the reference letter, to allow the installation of the three CIVs listed above without performing an ILRT. An alternate testing program for the inboard welds is proposed to assure the leak-tight integrity of the weld.

The construction code applied in the replacement of the valves, ANSI B-31.1-1967 with Addenda A, prescribes the testing requirements for installation of the new valves. Specifically, Table 136.5.1 prescribes the Mandatory Minimum Nondestructive Tests for Welds. For the welds in question, the code does not require radiography, liquid penetrant, nor magnetic particle testing. Section 137.1 does, however, require that leak tightness be demonstrated. This section states:

A017
1/1

"It shall be mandatory that the design, fabrication, and erection of power piping, constructed under this Code demonstrate leak tightness. This requirement shall be met by a hydrostatic leak test prior to initial operation. **Where a hydrostatic test is not practicable**, an initial service leak test, a vacuum test, or **100 per cent radiography of all welded joints** in an all welded system **may be substituted."** [*emphasis added*]

The Authority is planning to perform 100% radiography of the final welds in lieu of an LLRT or the hydro-test as stated above. In addition to the requirements of the code, dye penetrant or magnetic particle tests will also be performed on the welds. This will assure that no surface flaw exists which could lead to a leakage path. These non-destructive examinations meet the intent of Appendix J §IV.A, which is to assure that modifications to the containment pressure boundary are leak-tight.

Should you or your staff have any questions regarding this matter, please contact Mr. J. A. Gray, Jr. of my staff.

Very truly yours,

for John C. Brons
Executive Vice President
Nuclear Generation

Attachment: as stated

cc: U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Office of the Resident Inspector
U.S. Nuclear Regulatory Commission
P.O. Box 136
Lycoming, NY 13093

Mr. Harvey Abelson
Project Directorate I-1
Division of Reactor Projects - I/II
U.S. Nuclear Regulatory Commission
Mail Stop 14 B2
Washington, D.C. 20555

ATTACHMENT TO JPN-88-033

ALTERNATE LOCAL LEAK RATE TESTING TECHNIQUES

BACKGROUND

The Authority is replacing containment isolation valves in a program designed to improve the long term leakage characteristics of the FitzPatrick containment. In accordance with 10 CFR 50 Appendix J §IV.A, leak rate testing (Type A, B, or C test as appropriate) must be performed on all modifications to the containment which could affect the leak tight integrity of the containment system.

Three of the valves scheduled for replacement during the 1988 refueling outage are the two RHR containment spray inboard CIVs (10-MOV-31A and 31B) and the HPCI turbine exhaust manual isolation valve (23-HPI-11). Due to the piping configuration, the welds attaching the inboard side of these valves to their respective containment penetrations cannot be pressure tested in a Type B or C Local Leakage Rate Test (LLRT).

CONVENTIONAL LLRT

Isolation of the weld from the containment atmosphere is necessary to create a LLRT test volume. There are no valves between the subject weld and the containment atmosphere which can isolate the weld. Alternate isolation techniques are discussed below.

INFLATABLE OR MECHANICAL PLUG

An inflatable plug cannot be used to test the weld because there is no practical way to route an air line to the plug to keep it inflated without breaching the test volume.

A mechanical plug cannot be inserted in, or removed from, the containment spray line because the internal geometry of the globe valve will not allow the plug to be passed through it.

Piping drawings indicate that flange connections might exist on the containment spray piping inside the drywell. It cannot be determined if the flange connections actually exist until the refueling outage, when access to the drywell is next permitted. The flanges may not have been installed or could have been removed or welded together since initial construction. If the flanges do exist and have not been welded together, the Authority will LLRT the subject welds.

It might be possible to pass a mechanical plug through the HPCI exhaust line valve (16" double disk gate valve). However, directly attached to the valve is a 16"x24" eccentric reducer. The specific geometry and finish of the internal surface of the 16" section on the reducer may not be sufficient to attach and seal a mechanical plug. It would be impossible to pass a 24" plug through the valve to isolate the pipe further downstream.

A plug could probably be installed in the end of the HPCI turbine exhaust line. To do this, the suppression pool would have to be drained down to at least 6 feet below the normal water level. The plug would be installed (and removed) by workers floating on the surface of the suppression pool in an inflatable raft. Even if installed, no assurance can be made that the plug would be air tight and seal against 45 psig. The Authority considers this method to be very impractical.

FREEZE SEAL

Generally, freeze seals are applied to isolate a line against a water elevation head of a few psi to allow valve maintenance or pipe replacements activities downstream of the plug. We do not consider it practical to use a freeze seal to isolate against the differential pressure needed for a LLRT. The HPCI exhaust line would require a 24" freeze seal to hold at 45 psi differential pressure. This results in over 6,000 lbs of force being applied against the seal. There is also no way to verify the leaktightness of the freeze seal.

The configuration of the piping does not lend itself to the creation of a freeze plug. Approximately 1 foot of piping is accessible after the reducer before the pipe passes through the torus room wall. On the other side of the wall, approximately 2 feet of pipe is accessible before it enters the the torus. Inside the torus, the line immediately elbows downward and is open to the suppression pool. Also, the close proximity of the weld to the torus would require a freeze seal close to the torus shell. The potential exists to lower he torus shell temperature below its NDT temperature which could result in damage to it.

In addition, this line does not normally contain water. There is no practical way to fill the line without risking injection of water into the HPCI turbine.

The containment spray header is open inside the containment. A review of the piping drawings shows no loop seals in the spray piping which could be used to hold water to create the seal. No water can be held inside the pipe to create the freeze seal unless each containment spray nozzle is sealed. There are over 500 spray nozzles inside the containment which would need to be individually capped and tested for leak tightness before the spray piping could be filled with water to create the freeze seal. The Authority does not consider this practical. Also the substantial radiation exposures to workers inside the containment performing this work would be substantial and could not be justified in light of any perceived benefit.

VACUUM TEST

A alternate means to test the leak integrity of the welds is by constructing weld channels over the welds and either creating a vacuum or pressurizing the channel (reverse testing the weld). Neither of these techniques is satisfactory.

A vacuum test cannot achieve the required 45 psi differential pressure across the weld. The differential pressure resulting from a perfect vacuum outside the the pipe will not exceed 14.7 psid (based upon atmospheric pressure inside the pipe).

The pressure channel would require welding a test channel across the welds. This is impractical due to the costs involved. One side of the weld channel would be welded to the valve body. The geometry and finish of valve bodies do not lend themselves to external weldments. The test channel would also create new, unanalyzed heat affected zones and residual stresses on the valve body casting and downstream piping, and hinder future weld inspections.

GENERIC PROBLEMS

Since the welds are required to pass 100% radiography and either dye penetrant or magnetic particle examinations, the magnitude of any through wall flaw which could allow leakage would be exceedingly small and practically immeasurable. To accurately test for leakage of this magnitude, test equipment, connections, and isolations would need to be virtually perfect. We cannot assure that leakage that is measured, if any, is actually due to the weld under test or is in some other untestable part of the test volume (e.g., the mechanical seal or internal to the test equipment) or accuracy of the test equipment.