

Nuclear Power Plant
P.O. Box 215
Buchanan, New York 10511
914 736.8001



Robert J. Barrett
Plant Manager

January 3, 1997
IPN-97-002

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

SUBJECT: Indian Point 3 Nuclear Power Plant
Docket No. 50-286
License No. DPR-64
Request for Relief From ASME Code Section XI Per 10 CFR 50.55a

Dear Sir:

This letter requests relief from ASME Code Section XI requirements for corrective actions for flaws that exceed code acceptance limits for components that are in service. During an inspection by plant operations personnel on December 7, 1996, a leak was observed on the service water (SW) supply pipe to the #35 Fan Cooler Unit (FCU). The leak existed at a weld on the upstream weld neck flange for containment isolation valve SWN-41-5. The leak rate was approximately 8 drops per minute. The leak is outside the containment isolation boundary. The affected SW line (number 11e) is a 10 inch ASTM A-53 carbon steel ANSI B 31.1 cement lined pipe. This pipe is within the safety related boundary of the SW system and is an ISI Class 3 pipe.

The Authority performed an evaluation in accordance with the guidance provided in Generic Letter (GL) 90-05 and confirmed the structural integrity of the pipe until the next refueling outage RO 9, which is scheduled for Spring 1997.

The Authority considers the code repair/replacement of this pipe during power operation impractical and requests relief in accordance with 10 CFR 50.55a(g) for a temporary non-code repair using the guidance described in GL 90-05. The Authority plans to defer code repair/replacement of this pipe to the next refueling outage (RO 9, scheduled for Spring 1997).

In addition, the Authority would like to install a patch to cover the area of the pin hole leak, as a temporary modification in accordance with Authority procedures. The patch would be reinforced with a metal shim and held in place by clamps. This temporary modification is intended to be used as a means of stopping or reducing the leakage, for housekeeping purposes only.

1/1
Ad47

9701130211 970103
PDR ADOCK 05000286
P PDR

The Authority's request for relief is in Attachment I. The evaluation for the structural integrity of the pipe is in Attachment II and the commitments made by the Authority are in Attachment III.

Should you have any questions regarding this matter, please contact Mr. K. Peters at (914) 736-8029.

Very truly yours,



Robert J. Barrett
Plant Manager

Attachments.

cc: Mr. Hubert J. Miller
Regional Administrator
Region I
U.S. Nuclear Regulatory Commission
475 Allendale Road
King of Prussia, PA 19406

Resident Inspector's Office
Indian Point Unit 3
U.S. Nuclear Regulatory Commission
P.O. Box 337
Buchanan, NY 10511

Mr. George F. Wunder, Project Manager
Project Directorate I-1
Division of Reactor Projects I/II
U.S. Nuclear Regulatory Commission
Mail Stop 14 B2
Washington, DC 20555

REQUEST FOR RELIEF FROM THE REQUIREMENTS OF ASME SECTION XI

Background

During an inspection by plant operations personnel on December 7, 1996, a leak was observed on the service water (SW) supply line to the #35 Fan Cooler Unit (FCU). The leak existed on the weld associated with the upstream weld neck flange for containment isolation valve SWN-41-5. The leak rate was approximately 8 drops per minute. The leak is outside the containment isolation boundary. The affected SW line (number 11e) is a 10 inch ASTM A-53 carbon steel ANSI B 31.1 cement lined pipe. This pipe is within the safety related boundary of the SW system and is an ISI Class 3 pipe.

Radiographic examination (RT) and Ultrasonic testing (UT) showed that there is a pin hole leak in the weld within a length of approximately 1.55 inches of degraded weld material with a remaining wall thickness of less than 0.110 inches (30% of nominal wall thickness). Away from this area, the minimum wall thickness was measured to range from 0.120 inches (33% of nominal wall thickness) to 0.418 (114% of nominal wall thickness). These values are greater than 0.110 inches, the minimum required pipe wall thickness as calculated by the Authority in accordance with the guidance of Generic Letter 90-05, but often less than 0.319 inches, which is based on the 12.5% tolerance for ASTM piping products.

ASME Code Requirements From Which Relief Is Requested

The request for relief applies to the requirements of ASME Code Section XI, 1983 Edition through the Summer 1983 Addenda, Articles IWA-4000, IWD-3000, IWB-3400, IWB-3500, and IWB-3600. The affected pipe is included in the ASME Code Section XI Class 3 inservice inspection program. The Authority performed an evaluation using the "through-wall" approach for the pin hole area and the "wall thinning" approach outside the pin hole area in accordance with the guidance provided in GL 90-05. The structural integrity of the pipe for the service requirements of the system was confirmed for approximately 6 months. The UT measurements in the pin hole area showed a circumferential flaw length of approximately 1.55 inches. The structural integrity evaluation performed by the Authority concluded that a circumferential flaw length of up to 2.75 inches was acceptable for this portion of the SW line. IWB-3122.4 allows components whose volumetric or surface examination reveal flaws that exceed the acceptance standards of IWB-2500-1, to be acceptable without removal, repair, or replacement, if an analytical evaluation, as described in IWB-3600 meets the acceptance criteria of IWB-3600. Therefore, relief is requested from the requirements of IWA-4000, IWD-3000, and various sections of IWB-3000 as described above, to allow continued operation with the flawed SW pipe.

The Authority proposes to install a patch (approximately 1/8 inch thick) to cover the area of the pin hole leak, as a temporary modification. The patch will be reinforced with a metal shim

and held in place by clamps. This temporary modification is intended to be used as a means of stopping or reducing the leakage for housekeeping concerns, reducing the leakage through the flaw so that any degradation due to flow induced erosion is reduced, and protect the surrounding plant equipment from potential water damage. The size of the patch also allows for monitoring the flaw, such that should the leak rate increase and the flaw exceed the size of the patch, a UT/RT can be performed before the structural integrity limit of 2.75 inches is exceeded.

The specific technical considerations applicable to the code repair/replacement of the affected SW pipe deferral are as follows: The pipe is unisolable and a code repair or replacement would require a plant shutdown. A temporary modification of installing a patch over the pin hole leak area is being proposed to reduce the leakage. This temporary modification is fully reversible. The leak will be monitored weekly by visual inspection without removing the patch, and if there is an increase in the leak rate, a UT/RT will be conducted. This area will also be monitored by UT/RT every 3 months for any increase in the flaw length until the pipe is replaced or a code repair is performed during the RO 9 outage.

Impracticality Determination

The leak is in a portion of line number 11e that is unisolable and a plant shutdown would be needed to perform code repair or replace the affected section of the pipe. Application of a liquid nitrogen freeze seal to facilitate the repair of similar areas has been previously investigated. However, given the age of the cement liner in the service water pipe to be repaired, it is possible that degradation of the cement liner may occur as a result of the freeze seal application. Furthermore, "through wall" and "wall thinning" calculations performed by the Authority indicate that there is adequate structural integrity of the pipe for service until the next refueling outage. Based on the above, the Authority believes it would be imprudent to use the freeze seal method, and judges deferral of the code repair/replacement of the pipe to the next refueling outage (RO 9, scheduled for Spring 1997) to be the proper course of action.

Root Cause Determination And Flaw Characterization

The UT indications showed one pin hole in the weld along with a length of thinned wall of approximately 1.55 inches and some additional smaller lengths along the weld with less than 0.110 inch wall thickness. Away from the leak, the minimum wall thickness ranged from 0.120 to 0.418 inches in the surrounding base metal and weld. Based on similar pipes previously evaluated, the most likely cause of this flaw can be attributed to crevice corrosion where a corrosion mechanism is created in the gap that is found between two welded sections of cement lined pipes. This preliminary assessment is based on RT and UT results and flaw characterization. A thorough metallurgical evaluation of the weld will be required to confirm the corrosion mechanism. This evaluation will be performed if the affected pipe is replaced.

Operating System Assessment

As part of the Authority's Deviation Event Report (DER) process, DER 96-2653 recorded the degraded pipe. Subsequently, the pipe was inspected by RT and UT and an evaluation was performed to determine its structural integrity. An evaluation of the NDE results and calculation of structural integrity in accordance with the guidance of GL 90-05 concluded that the flawed pipe is structurally adequate to perform its intended design function and the system was judged to be operable. Given the moderate energy of the SW piping system, leak before break methodology is assumed. It can be expected that such a leak will increase rather than the pipe experience a catastrophic failure. Given the location, any deterioration of the flaw would be discovered quickly either by the plant operators or by system engineering personnel during the weekly inspection of the leak as required by GL 90-05.

Flaw Evaluation and Structural Integrity Assessment

A structural evaluation was performed which concludes that the pipe is structurally acceptable until the next refueling outage scheduled for Spring 1997 and will not fail catastrophically under all design loading conditions, including the Design Basis Earthquake (DBE) and Operating Basis Earthquake (OBE). The potential for vibration induced fatigue failure is highly unlikely because the piping is supported/restrained on both sides within a short run with local restraint and there is no identified source of vibration.

The probability of failure of the cement liner affecting the flow is limited because the line is 10 inches in diameter and the cement liner is approximately 1/4 inch thick. The potential for loss of flow to the system will be insignificant given the size of the leak (8 drops/minute) as compared to the supply flow to the FCU (570-1400 gpm). Consequences of flooding and spraying of water on surrounding equipment would be minimized with the installation of the patch over the leak area.

Augmented Inspection

RT and UT was performed on the pipe weld and adjacent area and the Non-Destructive Examination (NDE) Report was reviewed by Engineering. An extent of condition (augmented) inspection using RT and UT was performed on five (5) other similar welds considered most susceptible and accessible in accordance with the guidelines of GL 90-05. The extent of condition examination found that all five welds are acceptable. However, these welds will be re-examined during the next refueling outage.

Periodic augmented inspections (UT/RT) will be conducted on line number 11e pipe weld flaw every three months to ensure that the structural integrity of the pipe is maintained within the allowable flaw length for all design loading conditions. Qualitative (visual) assessment of the flawed pipe will be performed weekly by systems engineering personnel during plant walkdown to monitor any change in the condition of the flaw.

Summary

The Authority believes that the affected pipe has sufficient structural stability and is capable of performing its intended function until the next refueling outage scheduled for Spring 1997. Therefore, the Authority believes that relief from the requirements of ASME Code Section XI, 1983 Edition through the summer 1983 Addenda, Articles IWA-4000, IWD-3000, IWB-3400, IWB-3500 and IWB-3600 for the flaw on SW pipe line number 11e should be granted.

Docket No. 50-286
IPN-97-002
Attachment II

STRUCTURAL INTEGRITY EVALUATION FOR
SERVICE WATER LINE NUMBER 11e

NEW YORK POWER AUTHORITY
INDIAN POINT 3 NUCLEAR POWER PLANT
DOCKET NO. 50-286
DPR-64