

Indian Point 3
Nuclear Power Plant
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Robert J. Barrett
Site Executive Officer

May 17, 1999
IPN-99-056

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 the ASME Code Section XI requirements for corrective actions for flaws that exceed code acceptance limits for components that are in service. On April 18, 1999, plant operations personnel observed a pin hole leak on the Section XI, Class 3, service water (SW) supply pipe to component cooling water heat exchanger # 31. The leak rate, on the weld downstream of valve SWN-34-1, when found, was estimated to be approximately 4 drops per minute. The affected SW line (number 411) is an 18 inch ASTM A-53 carbon steel ANSI B 31.1 cement lined pipe within the safety related ASME Section XI Class 3 boundary of the SW system.

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 for approximately 2 1/2 years.

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 10, scheduled to start on September 10, 1999.

The proposed non-code repair will consist of installing a rubber patch to cover the area of the pin hole leak, in accordance with the Authority's temporary modification procedure. This temporary modification is intended to be used as a means of stopping or reducing the leakage for housekeeping purposes only, does not affect the structural integrity of the piping, and is fully reversible.

The Authority's request for relief is in Attachment I. The evaluation for the structural integrity of the pipe is in Attachment II.

There are no new commitments being made in this submittal.

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

Very truly yours,


Robert J. Barrett
Site Executive Officer

Attachments: As stated

cc: Mr. Hubert J. Miller
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Docket No. 50-286
IPN-99-056
Attachment I

REQUEST FOR RELIEF FROM THE REQUIREMENTS
OF ASME SECTION XI

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

REQUEST FOR RELIEF FROM THE REQUIREMENTS OF ASME SECTION XI

Background

On April 18, 1999, plant operations personnel observed a pin hole leak on the Section XI, Class 3, service water (SW) supply pipe to component cooling water heat exchanger # 31. The leak rate, on the weld downstream of valve SWN-34-1, when found, was approximately 4 drops per minute. The affected SW line (number 411) is an 18 inch ASTM A-53 carbon steel ANSI B 31.1 cement lined pipe within the safety related boundary of the SW system.

Ultrasonic testing (UT) of the weld showed a length of approximately 1.5 inches of degraded weld material with a remaining wall thickness of 0.058 inches (15% of nominal wall thickness) at the location of the leak. Away from this area, the wall thickness was measured to range from 0.140 inches (37% of nominal wall thickness) to 0.551 (147% of nominal wall thickness). These values are greater than 0.0654 inches, the minimum required pipe wall thickness as calculated by the Authority (Attachment II) in accordance with the guidance of Generic Letter 90-05, but often less than 0.328 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 2 1/2 years. The UT measurements in the pin hole area showed a circumferential flaw length in the weld area of approximately 1.50 inches. The structural integrity evaluation performed by the Authority concluded that a circumferential flaw length of up to 2.15 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, the Authority requests relief 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 will install a rubber patch to cover the area of the pin hole leak, as a temporary non-code repair. 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 to protect the surrounding plant equipment from potential water damage. The patch will also allow for monitoring the flaw by being fully removable, such that if during the weekly visual inspection the leak rate is observed to increase substantially, a UT/RT can be performed to verify the structural integrity.

Impracticality Determination

The specific technical considerations applicable to the code repair/replacement of the affected SW pipe deferral are as follows:

The leak is in a portion of line number 411 that can be isolated by valves SWN-34-1 and SWN-35-1 but the on-line repair presents uncertainty in valve holdoffs. These are butterfly valves and may leak by. The Authority has determined that the time required for the repair/replacement could exceed the 48 hour LCO allowed outage time for the CCW heat exchanger. 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 for approximately 2 1/2 years. Based on the above, the Authority believes it would be imprudent to repair the pipe flaw on line and judges deferral of the code repair/replacement of the pipe to the next refueling outage (RO 10, scheduled for September 1999) to be the proper course of action.

Root Cause Determination And Flaw Characterization

The UT results showed one pin hole in the center of the weld along with a length of thinned wall of approximately 1.50 inches and an additional point along the weld with approximately 0.140 inch wall thickness. Away from the leak, the pipe wall thickness ranged from 0.140 to 0.551 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 UT results.

Operating System Assessment

As part of the Authority's Deviation Event Report (DER) process, DER 99-0759 recorded the degraded pipe condition. Subsequently, the pipe was inspected by UT and an evaluation was performed to determine its structural integrity. An evaluation of the Non-Destructive Examination (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 experiencing 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 for service for approximately 2 1/2 years and will not fail catastrophically under all design loading conditions, including the Design Basis Earthquake (DBE) and Operating Basis Earthquake (OBE) (Attachment II). 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 18 inches in diameter and the cement liner is approximately 1/4 to 7/16 inch thick. The potential for loss of flow to the system will be insignificant given the size of the leak (4 drops/minute when found) as compared to the required supply flow to the component cooling water heat exchanger (2500-5000 gpm based on plant condition). Consequences of flooding and spraying of water on surrounding equipment would be minimized with the installation of the patch over the leak area. Currently, a catch container is installed and no other equipment is affected by the leak.

Augmented Inspection

UT was performed on the pipe weld and adjacent area and the NDE Report was reviewed by Engineering. An extent of condition (augmented) inspection using UT has been performed on five (5) other similar welds considered most susceptible and were found to be satisfactory.

Periodic augmented volumetric inspections will be conducted on the line number 411 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 walkdowns to monitor any change in the condition of the flaw or leak rate.

Summary

The Authority believes that the affected pipe has sufficient structural stability and is capable of performing its intended function for approximately 2 1/2 years. The Authority considers that it is more prudent to repair /replace the pipe during the next refueling outage scheduled to start on September 10, 1999. 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 411 should be granted.