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New York Power Authority

Robert J. Barrett
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June 6, 1996
IPN-96-062

U.S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 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 provides a request for relief from ASME Code, Section XI requirements for corrective actions for flaws that exceed code acceptance limits for components that are in service. During routine system inspections a pinhole leak was discovered in the weld heat affected zone on the body of Service Water (SW) valve SWN-49-1. Valve SWN-49-1 is a 3/4 inch carbon steel valve located on a stainless steel sampling/vent line that is connected to a SW discharge line from the 31 Component Cooling Water (CCW) heat exchanger. Valve SWN-49-1 is an ASME Code, Section III, Class 3 valve and is the ISI class 3 boundary. The Authority plans to defer repair or replacement of the leaking valve. The Authority considers the repair during power operation impractical and requests relief in accordance with 10 CFR 50.55a(g) for a temporary non-code repair using the guidance for the through-wall evaluation approach described in NRC Generic Letter 90-05.

The Authority's request for relief is contained in Attachment I. The commitments made by the Authority with this letter are contained in Attachment II.

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

Very truly yours,

Robert J. Barrett
Plant manager
Indian Point 3 Nuclear Power Plant

Attachments

cc: See next page

A047

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REQUEST FOR RELIEF FROM THE REQUIREMENTS OF ASME SECTION XI

Background

The Authority discovered by visual observation during a routine system inspection a through-wall pinhole leak in the weld heat affected zone on the body of Service Water (SW) valve SWN-49-1. Ultrasonic examination confirmed that the valve body had a small through-wall defect. Valve SWN-49-1 is a 3/4 inch carbon steel globe valve located on a stainless steel sampling/vent line that is connected to a SW discharge line from the 31 Component Cooling Water (CCW) heat exchanger. Valve SWN-49-1 is an ASME Code, Section III, Class 3 valve and is the ISI Class 3 boundary. The leak occurred on the valve body upstream of the valve disk. The Authority plans to defer repair or replacement of the leaking valve. The Authority considers the repair during power operation impractical and requests relief in accordance with 10 CFR 50.55a(g) for a temporary non-code repair using the guidance for the through-wall evaluation approach described in NRC Generic Letter 90-05.

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, Article IWA-4000, IWD-3000, IWB-3400, IWB-3500 and IWB-3600. The valve is part of an ASME Code Class 3 system (SW). The valve has a through-wall leak which is not specifically allowed by Section XI, Article IWB-3400 and IWB-3500. IWB-3122-4 allows "components" whose volumetric or surface examination reveals flaws that exceeds the acceptance standards to be acceptable without removal, repair, or replacement, if an analytical evaluation as described in IWB-3600 is completed. 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 this through-wall leak until the next scheduled or forced outage of sufficient duration (30 days) at which time the valve will be replaced. The specific technical considerations applicable to the proposed code repair deferral are discussed as follows. The valve will be left as is and no repair (sealant, clamps etc.) implemented. If the leakage of valve SWN-49-1 increases, the Authority will evaluate the condition and may implement a non-code repair that is reversible and meets the bounding conditions of the calculation for structural integrity used for this relief.

Impracticality Determination

The affected line can not, by itself, be isolated because there are no other isolation valves in the line. Isolation of the line containing the valve with a freeze seal was judged to be a risk not warranted for the as-is condition of the valve. There is a potential for line failure with a freeze seal which would result in requiring entry into the Limiting Condition for Operation (LCO) to isolate the leaking line.

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Without a freeze seal the valve can not be isolated without isolating the appropriate portion of the Service Water System flow path to the 31 Component Cooling Water (CCW) heat exchanger and entering a 48 hour allowed out of service time (AOT) per Technical Specification 3.3.E.2.c. The code repair may not be able to be completed within the time period allowed by the Limiting Condition for Operation (LCO). To isolate the service water line for the CCW heat exchanger the system would have to at least be partially drained. The estimated time required for system tagout, drain, repair, and restore to service could pose a challenge to the AOT of 48 hours. If the code repair were not completed within the Technical Specification allowed AOT time of 48 hours, the plant would have to be placed in hot shutdown within four hours and cold shutdown within the next 24 hours. Also, removing the 31 CCW heat exchanger with the plant at power unnecessarily challenges the CCW system and is not warranted for a limited flaw in a 3/4 inch valve that has adequate structural integrity. The Authority believes that it would be imprudent to isolate one of the CCW heat exchangers for a leak that has negligible impact on the safe operation of the plant.

Root Cause Determination and Flaw Characterization

A preliminary assessment by Engineering determined that the leak in the valve body was a result of a small through-wall pin hole in the valve body. Based on similar valves previously evaluated, the most likely cause can be attributed to under-deposit oxygen concentration cell corrosion. Ultrasonic Testing (UT) revealed that a localized defect (wall thinning/pitting) of the valve body wall had occurred. A thorough metallurgical evaluation of the removed valve would be required to confirm the corrosion mechanisms. The pin hole was at the heat affected weld area of the socket fitting. Under-deposit oxygen concentration cell corrosion has been identified and confirmed to be the cause of wall thinning/pitting in other similar valves. This preliminary assessment was based on UT results and flaw characterization that corresponds to previously identified mechanisms on other similar valves. A thorough metallurgical evaluation and root cause analysis will be performed when the valve is removed.

Operating System Assessment

As part of NYPA's Deviation Event Report (DER) procedure, a DER recorded the degraded valve and identified that the valve condition was judged to be operable. Engineering's assessment of the degraded condition determined that the degraded valve would not prevent the service water system from performing its function and remove heat from the CCW heat exchanger.

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Subsequently, the valve was inspected by UT and a calculation performed to determine its structural integrity using the guidelines of Generic Letter 90-05. The sample line containing the valve is located in a service water pipe downstream of the CCW heat exchanger. An evaluation of the UT results and calculation of structural integrity concluded that the valve was degraded but operable. Calculations performed by engineering confirmed that the valve and system structural integrity would be maintained. Engineering judged that the system flow would be unaffected because the service water system has sufficient makeup to maintain system flow requirements. The amount of leakage was not measurable and after grinding for NDT, the leakage only wetted the local valve body surface. Because the leakage is currently not measurable, does not drip and only wets the valve body, the flaw's potential leakage was judged by engineering not to provide a flooding or system interaction concern.

Flaw Evaluation and Structural Integrity Assessment

A structural evaluation was performed which concludes that the through-wall defect is stable and will not fail catastrophically under all design loading conditions, including a Design Basis Earthquake (DBE) and Operating Basis Earthquake (OBE). The potential for failure of the valve and its piping connection is low based on the location of the valve and because it is considered a moderate energy system. Due to pipe and valve geometry the bending stress due to operating loads is very small.

Augmented Inspection

UT was performed on the valve and the NDE Report was reviewed by engineering. An extent of condition (augmented) inspection using Ultrasonic Testing (UT) was performed on five (5) other similar valves considered most susceptible and accessible in accordance with the guidelines of Generic Letter 90-05. The examination resulted in identifying one (1) valve with localized wall pitting. The defect in the valve is most likely due to under-deposit oxygen concentration cell corrosion. The pitting was evaluated and determined by engineering to be acceptable. As a result of identifying a degraded valve in the initial inspection, five additional valves were scheduled for inspection using UT and the results evaluated. Three valves have been inspected (UT), evaluated and found acceptable. Inspection (UT) and evaluation of the remaining two valves are scheduled to be completed by June 30, 1996.

Periodic augmented inspections (UT) will be conducted on valve SWN-49-1 every three months to ensure that the flaw remains within the allowable calculated acceptance standards for all design loading conditions. Qualitative (visual) assessment of the flaw will be performed on a weekly basis during plant walkdowns to monitor for any increase in leakage.

REQUEST FOR RELIEF FROM THE REQUIREMENTS OF ASME SECTION XI

Summary

The Authority beliefs that sufficient structural stability and makeup capability exist, and leakage would not detrimentally affect nearby components or structures. Therefore, the Authority believes that relief from the requirements of ASME Code Section XI, 1983 Edition through the summer 1983 Addenda, Article IWA-4000, IWB-3000, and IWD-3000 for the flaw on valve SWN-49-1 should be granted.

LIST OF COMMITMENTS

Number	Commitment	Due
IPN-96-062-01	Periodic augmented inspections (UT) will be conducted every three months to ensure that the flaw remains within the allowable calculated acceptance standards for all design loading conditions.	Every three months from initial UT on 4/25/96.
IPN-96-062-02	Qualitative assessment of the flaw will be performed on a weekly basis during plant walkdowns to monitor for any increase in leakage.	Weekly
IPN-96-062-03	Inspect two additional valves using UT and evaluate the results.	6/30/96
IPN-96-062-04	Replace valve SWN-49-1 during the next scheduled or forced outage of sufficient duration (30 days).	Refueling Outage 9 (RO9) or forced outage of sufficient duration (30 days).
IPN-96-062-05	A thorough metallurgical evaluation and root cause analysis will be performed when the valve is removed.	Two months from removal of valve in RO9 (5/97) or forced outage of sufficient duration (30 days).