

November 1, 2000

Mr. A. Alan Blind  
Vice President, Nuclear Power  
Consolidated Edison Company  
of New York, Inc.  
Broadway and Bleakley Avenue  
Buchanan, NY 10511

SUBJECT: RELIEF REQUEST NOS. 50, 51, AND 52 FROM AMERICAN SOCIETY OF  
MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE  
SECTION XI, INDIAN POINT NUCLEAR GENERATING UNIT NO. 2  
(TAC NO. MA6909)

Dear Mr. Blind:

In a letter dated October 4, 1999, Consolidated Edison Company of New York, Inc. (Con Edison), submitted Relief Request Nos. 50, 51, and 52 from the requirements of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for the third 10-year inservice inspection (ISI) interval at the Indian Point Nuclear Generating Unit No. 2 (IP2). These requests for relief were associated with volumetric examination of component welds.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the proposed relief requests regarding the ISI requirements of Section XI of the 1989 Edition of the ASME Code. The NRC staff concluded that certain inservice examinations presented in the proposed relief requests cannot be performed to the extent required by the ASME Code for IP2 and, thus, are impractical. However, the proposed examinations described in the requests provide reasonable assurance of the structural integrity of the welds. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), Relief Request Nos. 50, 51, and 52 are granted for the third 10-year ISI interval. The detailed results of the staff's review are provided in the enclosed safety evaluation.

If you should have any questions, please contact Patrick Milano at 301-415-1457. This completes the NRC staff's action on TAC No. MA6909.

Sincerely,

***/RA by Timothy G. Colburn for/***

Marsha Gamberoni, Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-247

Enclosure: Safety Evaluation

cc w/encl: See next page

Mr. A. Alan Blind  
Vice President, Nuclear Power  
Consolidated Edison Company  
of New York, Inc.  
Broadway and Bleakley Avenue  
Buchanan, NY 10511

November 1, 2000

SUBJECT: RELIEF REQUEST NOS. 50, 51, AND 52 FROM AMERICAN SOCIETY OF  
MECHANICAL ENGINEERS BOILER AND PRESSURE VESSEL CODE  
SECTION XI, INDIAN POINT NUCLEAR GENERATING UNIT NO. 2  
(TAC NO. MA6909)

Dear Mr. Blind:

In a letter dated October 4, 1999, Consolidated Edison Company of New York, Inc. (Con Edison), submitted Relief Request Nos. 50, 51, and 52 from the requirements of Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) for the third 10-year inservice inspection (ISI) interval at the Indian Point Nuclear Generating Unit No. 2 (IP2). These requests for relief were associated with volumetric examination of component welds.

The U.S. Nuclear Regulatory Commission (NRC) staff reviewed the proposed relief requests regarding the ISI requirements of Section XI of the 1989 Edition of the ASME Code. The NRC staff concluded that certain inservice examinations presented in the proposed relief requests cannot be performed to the extent required by the ASME Code for IP2 and, thus, are impractical. However, the proposed examinations described in the requests provide reasonable assurance of the structural integrity of the welds. Therefore, pursuant to 10 CFR 50.55a(g)(6)(i), Relief Request Nos. 50, 51, and 52 are granted for the third 10-year ISI interval. The detailed results of the staff's review are provided in the enclosed safety evaluation.

If you should have any questions, please contact Patrick Milano at 301-415-1457. This completes the NRC staff's action on TAC No. MA6909.

Sincerely,

*/RA by Timothy G. Colburn for/*

Marsha Gamberoni, Chief, Section 1  
Project Directorate I  
Division of Licensing Project Management  
Office of Nuclear Reactor Regulation

Docket No. 50-247  
Enclosure: Safety Evaluation  
cc w/encl: See next page

ACCESSION NUMBER: ML003757280 \*See previous concurrence

OFFICE	PDI-1:PM*	PDI-1:LA	EMCB:SC*	OGC*	PDI-1:SC
NAME	PMilano	TClark for SLittle	ESullivan	JMoore	TColburn for MGamberoni
DATE	11/01/00	11/01/00	10/18/00	10/31/00	11/1/00

OFFICIAL RECORD COPY

DISTRIBUTION:

November 1, 2000

PUBLIC  
PDI-1 Reading  
E. Adensam  
M. Gamberoni  
E. Sullivan  
A. Keim  
P. Milano  
S. Little  
M. Opredek, R-I  
J. Shea, EDO  
G. Hill (2)  
OGC  
ACRS

Indian Point Nuclear Generating Station  
Unit 2

Mayor, Village of Buchanan  
236 Tate Avenue  
Buchanan, NY 10511

Mr. F. William Valentino, President  
New York State Energy, Research,  
and Development Authority  
Corporate Plaza West  
286 Washington Ave. Extension  
Albany, NY 12203-6399

Mr. John McCann  
Manager of Nuclear Safety and  
Licensing  
Consolidated Edison Company  
of New York, Inc.  
Broadway and Bleakley Avenue  
Buchanan, NY 10511

Senior Resident Inspector  
U. S. Nuclear Regulatory Commission  
P.O. Box 38  
Buchanan, NY 10511

Mr. Brent L. Brandenburg  
Assistant General Counsel  
Consolidated Edison Company  
of New York, Inc.  
4 Irving Place - 1822  
New York, NY 10003

David Lochbaum  
Nuclear Safety Engineer  
Union of Concerned Scientists  
1707 H Street, NW., Suite 600  
Washington, DC 20006

Edward Smeloff  
Pace University School of Law  
The Energy Project  
78 North Broadway  
White Plains, NY 10603

Charles Donaldson, Esquire  
Assistant Attorney General  
New York Department of Law  
120 Broadway  
New York, NY 10271

Ms. Charlene D. Faison, Director  
Nuclear Licensing  
Power Authority of the State  
of New York  
123 Main Street  
White Plains, NY 10601

Mr. Thomas Rose  
Secretary - NFSC  
Consolidated Edison Company  
of New York, Inc.  
Broadway and Bleakley Avenue  
Buchanan, NY 10511

Regional Administrator, Region I  
U. S. Nuclear Regulatory Commission  
475 Allendale Road  
King of Prussia, PA 19406

Mr. Paul Eddy  
New York State Department of  
Public Service  
3 Empire State Plaza, 10th Floor  
Albany, NY 12223

Jim Riccio  
Public Citizen's Critical Mass Energy Project  
215 Pennsylvania Ave., SE  
Washington, DC 20003

Michael Mariotte  
Nuclear Information & Resources Service  
1424 16<sup>th</sup> Street, NW, Suite 404  
Washington, DC 20036

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM PLAN

REQUEST FOR RELIEF NOS. 50, 51, AND 52

CONSOLIDATED EDISON COMPANY OF NEW YORK, INC.

INDIAN POINT NUCLEAR GENERATING UNIT NO. 2

DOCKET NO. 50-247

1.0 INTRODUCTION

In a letter dated October 4, 1999, Consolidated Edison Company of New York, Inc. (Con Edison or the licensee), submitted three requests for relief from the volumetric examination requirement of Section XI of American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code). The information provided by the licensee in support of the requests for relief from Code requirements has been evaluated pursuant to the provisions of 10 CFR 50.55a(g)(6)(i), and the basis for disposition is documented below.

2.0 BACKGROUND

The inservice inspection of the ASME Code Class 1, 2, and 3 components will be performed in accordance with Section XI of the ASME Code and applicable edition and addenda as required by 10 CFR 50.55a(g), except where specific written relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). 10 CFR 50.55a(a)(3) states, in part, that alternatives to the requirements of paragraph (g) may be used, when authorized by the U.S. Nuclear Regulatory Commission (NRC), if the licensee demonstrates that: (i) the proposed alternatives would provide an acceptable level of quality and safety, or (ii) compliance with the specified requirements would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Pursuant to 10 CFR 50.55a(g)(4), ASME Code Class 1, 2, and 3 components (including supports) will meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," to the extent practical within the limitations of design, geometry, and materials of construction of the components. The regulations require that inservice examination of components and system pressure tests conducted during the first 10-year interval and subsequent intervals comply with the requirements in the latest edition and addenda of Section XI of the ASME Code incorporated by reference in 10 CFR 50.55a(b) twelve months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The inservice inspection Code of Record for Indian Point Nuclear Generating Unit No. 2 for the third 10-year interval is the 1989 Edition of the ASME Code. The components (including supports) may meet the requirements

Enclosure

set forth in subsequent editions and addenda of the ASME Code incorporated by reference in 10 CFR 50.55a(b) subject to the limitations and modifications listed therein and subject to Commission approval.

### 3.0 EVALUATION

#### 3.1 Relief Request Number 50

The components for which relief is requested:

Component:	Steam Generator
Code Class:	Quality Group B
References:	IWC-2500 Table 1
Examination Category:	C-B
Item Number:	C2.21
Description:	Nozzle to Shell Weld in Vessels >½"

Applicable ASME Section XI Code (1989 Edition) requirement from which relief is requested:

The 1989 Edition of ASME Section XI, Table IWB-2500-1, examination category C-B, item no. C2.21 requires a surface examination of the weld and adjacent base metal and a volumetric examination of the weld and adjacent base metal as defined by Figure IWC-2500-4(a) or (b). The ASME Code does not allow any limitations to the required volumetric or surface examinations, and 10 CFR 50.55a(g)(4), requires, "...coverage within the extent practical..." [or "greater than 90%" as clarified in NRC Information Notice 98-42].

Licensee's Basis for Requesting Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested on the basis that complying with the greater than 90% requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Indian Point 2 was designed prior to the existence of the ASME Section XI Code, and the design requirement for inspection access. A ring designed to hold insulation was permanently attached to the steam generator two inches below the feedwater nozzle. This ring prevents the complete ultrasonic coverage of a 26 inch area near the 6 o'clock position of the nozzle. Estimated coverage for the complete examination was calculated to be 80.4%. (See Attachment 1 [to Relief Request No. 50 in application dated October 4, 1999] for a photograph of the insulation ring and limitation.)

Due to nozzle configuration, the examination can only be performed from one side. The insulation ring prevents a complete full V exam from the Shell side in the vicinity of the ring. The remaining 95 inches of weld are not impeded and a full V 100% ultrasonic examination is performed on the remaining nozzle to shell weld.

An ultrasonic examination, using multiple ultrasonic angles, is performed from above and below the insulation ring. (See Attachment 2 [to Relief Request No. 50 in application dated October 4, 1999], for a coverage plot of the nozzle and the

interference caused by the insulation ring.) This provides sound into the area of interest, and would identify cracks that are propagating through wall.

Licensee's Proposed Alternative (as stated):

Con Edison will continue to inspect the nozzle to shell weld of the feedwater nozzle from the accessible surfaces, constituting at least 80.4% of coverage. This examination, combined with the 100% surface examination and VT-2 visual leak examination, provides an acceptable level of quality and safety.

Licensee's Justification for Relief (as stated):

The proposed ultrasonic coverage of 80.4%, combined with the 100% surface examination and VT-2 leak examination provides an acceptable level of quality and safety.

Removal of the insulation support ring is difficult, costly, and constitutes a hardship without a compensating increase in the level of quality and safety of the component.

Staff Evaluation

In the 1989 Edition of ASME Section XI, Table IWC-2500-1, examination category C-B, item number C2.21 requires 100% volumetric examination of the weld and adjacent base metal as defined by Figures IWC-2500-4(a) or (b). However, a complete examination coverage of the subject welds is restricted. The examination of the nozzle-to-shell weld of the feedwater nozzle weld no. SGN-21-2 is limited due to the insulation support ring. The licensee used multiple scan angles to optimize the ultrasonic test (UT) coverage. Gaining additional access for examination of the subject welds would require design modifications such that the imposition of this requirement would impose a significant burden on the licensee.

The staff determined that the licensee will volumetrically examine the subject welds to the extent practical. The licensee will examine a significant portion of the subject welds, in addition to completing the surface examination. Based on the licensee's proposed ultrasonic coverage of 80.4%, combined with the 100% surface examination and VT-2 leak examination, the staff finds that any patterns of significant degradation, if present, would be detected. The above examinations provide reasonable assurance of structural integrity of the subject welds.

Staff Conclusion

The staff concludes that the inservice volumetric examination of the category C-B nozzle-to-shell welds cannot be performed to the extent required by the Code at Indian Point Unit 2 and are impractical. The licensee's proposed examinations provide reasonable assurance of structural integrity of the subject welds. Therefore, Relief Request No. 50 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year inservice inspection interval.

### 3.2 Relief Request Number 51

#### The components for which relief is requested:

Component:	Safety Injection System
Code Class:	Quality Group A
References:	IWB-2500 Table 1
Examination Category:	B-J
Item Number:	B09.11
Description:	Circumferential Welds 4" or Larger
Item Identifier:	Line 351 Weld 351-2

#### Applicable ASME Section XI Code (1989 Edition) requirement from which relief is requested:

The 1989 Edition of ASME Section XI Table IWB-2500-1, examination category B-J, item number B9.11 requires a surface examination of the weld and adjacent base metal and a volumetric examination of the weld and adjacent base metal as defined by Figure IWB-2500-8. The Code does not allow any limitations to the required volumetric or surface examinations and 10 CFR 50.55a(g)(4), requires, "...coverage within the extent practical..." [or "greater than 90%" as clarified in NRC Information Notice 98-42].

#### Licensee's Basis for Requesting Relief (as stated):

Pursuant to 10 CFR 50.55a(a)(3)(ii), relief is requested on the basis that complying with the greater than 90% requirement would result in a hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Indian Point 2 was designed prior to the existence of the ASME Section XI Code, and the design requirement for inspection access. The weld configuration prohibits coverage greater than 90% from one direction, and greater than 50% from two other directions. The weld is located in a high radiation area at the junction between the 21 Safety Injection System accumulator discharge pipe and the 21 Reactor Coolant System primary loop piping.

An ultrasonic examination, using multiple ultrasonic angles, is performed from both sides of the weld, as geometry permits. (See Attachment 1 [to Relief Request No. 51 in application dated October 4, 1999] for a coverage plot). Due to the weld configuration, additional coverage can not be obtained without extensive weld conditioning. Based on the weld profile developed using straight beam UT and contour gages, the amount of weld conditioning required to increase coverage would cause the weld thickness to violate minimum wall requirements. Furthermore, the weld conditioning which consists of extensive weld buildup and machining, is time consuming, is within a high radiation area, and very expensive. The current examination covers the area of interest to 90% in one direction, and provides sound into the area of interest, that would identify cracks that are propagating through wall. To perform extensive welding and machining within a high radiation area constitutes both a hardship and unusual difficulty without a compensating increase in quality or safety.

Licensee's Proposed Alternative (as stated):

Con Edison will continue to inspect weld 351-2 using multiple angles to provide the maximum coverage possible. This examination combined with the 100% surface examination and VT-2 visual leak examination that are also required provides an acceptable level of quality and safety.

Licensee's Justification for Granting Relief (as stated):

The proposed ultrasonic coverage of 90% from one direction and 50% from the other direction, combined with the required 100% surface examination and VT-2 leak examination provides an acceptable level of quality and safety.

Traditional weld conditioning to increase coverage will cause the weld to exceed the minimum wall requirements. Performing extensive welding and machining in a radiation area would pose ALARA justification challenges, and also be difficult and costly; it would, therefore, constitute a hardship without a compensating increase in the level of quality and safety.

Staff Evaluation

In the 1989 Edition of ASME Section XI, Table IWB-2500-1, examination category B-J, item number B09.11 requires 100% volumetric examination of the weld and adjacent base metal as defined by Figures IWB-2500-8. Complete volumetric examination coverage of the subject welds is restricted. Due to the weld configuration, additional coverage cannot be obtained without extensive weld conditioning. The licensee determined, based on the weld profile developed using straight beam UT and contour cages, the amount of weld conditioning required to increase coverage would cause the weld thickness to violate minimum wall requirements. The licensee used multiple scan angles to optimize the UT coverage. Gaining additional access for examination of the subject welds would require design modifications. Imposition of this requirement would impose a significant burden on the licensee.

The staff determined that the licensee will volumetrically examine the subject welds to the extent practical. The licensee will examine a significant portion of the subject welds, in addition to completing the surface examination. Based on the licensee's proposed ultrasonic coverage of 90% from one direction and 50% from the other direction, combined with the 100% surface examination and VT-2 leak examination, the staff finds that any patterns of significant degradation, if present, would be detected. The licensee's proposed examinations provide reasonable assurance of structural integrity of the subject welds.

Staff Conclusion

The NRC staff concludes that the inservice volumetric examinations for Line 351 Weld 351-2 cannot be performed to the extent required by the Code at Indian Point Unit 2 and are impractical. The licensee's proposed examinations provide reasonable assurance of structural integrity of the subject weld. Therefore, Relief Request No. 51 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year inservice inspection interval.

### 3.3 Relief Request Number 52

#### The components for which relief is requested:

Component:	Residual Heat Removal (RHR) Heat Exchanger
Code Class:	Quality Group B
References:	IWC-2500 Table 1
Examination Category:	C-A
Item Number:	C1.20
Description:	Head Circumferential Welds
Item Identifier:	Welds RHX C22-1 and RHX C22-2

#### Applicable ASME Section XI Code (1989 Edition) requirement from which relief is requested:

The 1989 Edition of ASME Section XI Table IWC-2500-1, examination category C-A, item number C1.20 requires a volumetric examination of the weld and adjacent base metal as defined by Figure IWC-2500-1. The Code does not allow any limitations to the required volumetric or surface examinations and 10 CFR 50.55a(g)(4), requires, "...coverage within the extent practical..." [or "greater than 90%" as clarified in NRC Information Notice 98-42].

#### Licensee's Basis for Requesting Relief (as stated):

Pursuant to 10 CFR 50.55(a)(3)(ii), relief is requested on the basis that complying with the greater than 90% requirement would result in hardship or unusual difficulty without a compensating increase in the level of quality and safety.

Indian Point 2 was designed prior to the existence of the ASME Section XI Code, and the design requirement for inspection access. The weld configurations and integral attachments near Weld C22-1 and the integral attachments near Weld C22-2 prohibit examination coverage greater than 80.6% and 85.7%, respectively. These welds were previously exempted from examination during Intervals 1, 2, and 3 due to high radiation field locations. The welds are still located in a high radiation area in the RHR heat exchanger cell; however, as a result of the 1995 RFO [refueling outage] full system decontamination, these examinations are now manageable.

Weld RHXC-22-1 is a flange to shell type weld. One-sided access is adequate for two beam path coverage (See Attachment 1 "Coverage Plot" [to Relief Request No. 52 in application dated October 4, 1999]) except in the areas of the nozzles and integral attachments. In those areas access is prohibited by the proximity of the nozzles and integral attachments. (See Attachment 2, "Limitation Sheet," and Attachment 3, "Photo of Nozzle and Integral Attachment Interference" [to Relief Request No. 52 in application dated October 4, 1999]). Total coverage is estimated to be 80.6%.

Weld RHXC-22-2 is a standard head to shell weld. A two-sided examination is obtained using a full V calibration. (See Attachment 4 "Coverage Plot" [to Relief Request No. 52 in application dated October 4, 1999]). Access is limited from one side in two 31.5 inch areas by two integral attachments (See Attachment 5 "Limitation Sheet" and Attachment 6 "Photo of Integral Attachment Interference" [to Relief Request No. 52 in application

dated October 4, 1999]) located on opposite sides of the vessel, 1.4 inches above the weld. Total coverage is estimated to be at least 85.7%.

Radiography is not possible due to the heat exchanger internals and the radiation levels associated with the heat exchanger and cell.

Licensee's Proposed Alternative (as stated):

The physical restrictions caused by the nozzles and integral attachments prevent any type of ultrasonic scanning in the areas where relief is being sought. Con Edison will continue to inspect welds RHXC-22-1 and RHXC-22-2 using 45 degree ultrasonic angles and full V calibration to provide the maximum coverage possible. This examination combined with the VT-2 visual leak examination provides an acceptable level of quality and safety.

Licensee's Justification for Relief (as stated):

Extensive structural modifications to the heat exchanger would be required in order to increase examination coverage access to Welds C22-1 and C22-2. This would represent unusual difficulty without a compensating increase in the level of quality and safety.

The proposed ultrasonic coverage of 80.6% for Weld C22-1 and at least 85.7% for Weld C22-2 in combination with the required VT-2 leak examination provides an acceptable level of quality and safety.

Staff Evaluation

In the 1989 Edition of ASME Section XI, Table IWC-2500-1, examination category C-A, item no. C1.20 requires 100% volumetric examination of the weld and adjacent base metal as defined by Figure IWC-2500-1. Complete examination coverage of the subject welds is restricted. Weld RHXC-22-1 is limited by the proximity of the nozzles and integral attachments. Weld RHXC-22-2 is limited by two integral attachments. Gaining additional access for examination of the subject welds would require design modifications. Imposition of this requirement would impose a significant burden on the licensee.

The staff determined that the licensee will volumetrically examine the subject welds to the extent practical. The licensee will volumetrically examine a significant portion of the subject welds. Based on the licensee's proposed ultrasonic coverage of 80.6% for weld C22-1 and 85.7% for weld C22-2, combined with the 100% surface examination and VT-2 leak examination, the staff finds that any patterns of significant degradation, if present, would be detected. The licensee's proposed examinations provide reasonable assurance of structural integrity of the subject welds.

Staff Conclusion

The staff concludes that inservice volumetric examinations of the RHR heat exchanger head welds cannot be performed to the extent required by the Code at Indian Point Unit 2 and are

impractical. The licensee's proposed examinations provide reasonable assurance of structural integrity of the subject welds. Therefore, Relief Request No. 52 is granted pursuant to 10 CFR 50.55a(g)(6)(i) for the third 10-year inservice inspection interval.

#### 4.0 CONCLUSION

The staff has determined that granting relief pursuant to 10 CFR 50.55a(g)(6)(i) is authorized by law and will not endanger life or property or the common defense and security, and is otherwise in the public interest giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

Principal Contributor: A. Keim

Date: November 1, 2000