

June 6, 2003

Mr. John L. Skolds, Chairman
and Chief Executive Officer
AmerGen Energy Company, LLC
4300 Winfield Road
Warrenville, IL 60555

SUBJECT: THREE MILE ISLAND NUCLEAR STATION, UNIT 1 (TMI-1) RE: SECOND
AND THIRD 10-YEAR INTERVAL INSERVICE INSPECTION (ISI) PROGRAM
REQUESTS FOR RELIEF, RR-02-19, PARTS A THROUGH N, AND RR-02-20
(TAC NO. MB4482)

Dear Mr. Skolds:

By letter dated March 5, 2002, you submitted proposed reliefs and alternatives RR-02-19, parts A through N, and RR-02-20 for the second and third 10-year ISI intervals at TMI-1. This included relief for certain examinations performed during the previous R14 refueling outage which ended December 2001, because as stated in your application, due to the configuration of certain welds, it was not possible to obtain the required examination coverage. The third 10-year ISI interval for TMI-1 began on April 20, 1991. During the R14 outage, third 10-year interval examinations were being performed in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code), Section XI, 1995 Edition through 1996 Addenda, along with deferred second 10-year interval examinations in accordance with the ASME Code, Section XI, 1986 Edition, and augmented examinations of reactor vessel shell welds in accordance with the ASME Code, Section XI, 1989 Edition. Your letter of February 3, 2003, responded to the Nuclear Regulatory Commission (NRC) staff's January 17, 2003, request for additional information. The NRC staff has completed its review of your requested reliefs and proposed alternatives.

Based on our review of relief requests RR-02-19, parts A through N, and RR-02-20, the NRC staff concludes that American Society of Mechanical Engineers Code requirements are impractical and the volumetric examinations performed provide reasonable assurance of structural integrity for the subject components. Giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility, this relief will not endanger life or property or the common defense and security and is otherwise in the public interest. Therefore, the licensee's requests for relief are granted pursuant to 10 CFR 50.55a(g)(6)(i) for the second and third 10-year ISI intervals at TMI-1, for RR-02-19 and RR-02-20, respectively.

J. Skolds

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Details of the NRC staff's review are contained in the enclosed safety evaluation. If you have any questions, please contact Mr. Timothy G. Colburn at 301-415-1402.

Sincerely,

/RA/

Richard J. Laufer, Chief, Section 1
Project Directorate I
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

Docket No. 50-289

Enclosure: Safety Evaluation

cc w/encl: See next page

J. Skolds

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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SECOND AND THIRD 10-YEAR INTERVAL INSERVICE INSPECTION PROGRAM

REQUESTS FOR RELIEF RR-02-19 AND RR-02-20

AMERGEN ENERGY COMPANY, LLC

THREE MILE ISLAND NUCLEAR STATION, UNIT 1

DOCKET NO. 50-289

1.0 INTRODUCTION

The Nuclear Regulatory Commission (NRC) staff has reviewed the application dated March 5, 2002, in which AmerGen Energy Company, LLC (the licensee) requested relief from the second 10-year interval Inservice Inspection (ISI) Program (RR-02-19, parts A through N) and third 10-year interval ISI Program (RR-02-20) for Three Mile Island Nuclear Station, Unit 1 (TMI-1). This included relief for certain examinations performed during the previous R14 refueling outage which ended December 2001, because as stated in the licensee's application, due to the configuration of certain welds, it was not possible to obtain the required examination coverage. The third 10-year ISI interval for TMI-1 began on April 20, 1991. During the R14 outage, third 10-year interval examinations were being performed in accordance with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code or Code), Section XI, 1995 Edition through 1996 Addenda, along with deferred second 10-year interval examinations in accordance with the ASME Code, Section XI, 1986 Edition, and augmented examinations of reactor vessel shell welds in accordance with the ASME Code, Section XI, 1989 Edition. The licensee provided additional information in its letter dated February 3, 2003.

The information provided by the licensee in support of the request for relief from the ASME Code requirements has been evaluated and the basis for disposition is documented below.

2.0 REGULATORY EVALUATION:

Inservice inspection of ASME Code, Class 1, 2, and 3 components is to be performed in accordance with Section XI, of the ASME Code, "Rules for Inservice Inspection of Nuclear Power Plant Components," and applicable addenda as required by Title 10 of the Code of Federal Regulations (10 CFR), Section 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(6)(g)(i). Paragraph (a)(3) of 10 CFR 50.55a states that alternatives to the requirements of the regulations may be used when authorized by the Director of the Office of Nuclear Reactor Regulation. The applicant shall demonstrate that: (i) the proposed alternatives would provide an acceptable level of quality and

ENCLOSURE

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) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction 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 reference in 10 CFR 50.55a(b), 12 months prior to the start of the 120-month interval, subject to the limitations and modifications listed therein. The Code of record for the TMI-1 second 10-year ISI interval is the 1986 Edition, no addenda, of the ASME Code. The Code of record for the TMI-1 third 10-year ISI interval is the 1995 Edition, through the 1996 Addenda, of the ASME Code.

3.0 TECHNICAL EVALUATION

3.1 Request for Relief No. RR-02-19, Part A

Code Requirement: (As stated by the licensee)

10 CFR 50.55a(g)(6)(ii)(A)(2) requires licensees to implement the examination requirements of the 1989 Edition of ASME Code Section XI for Reactor Vessel shell welds. Subsection IWB, Table IWB-2500-1, Examination Category B-A, Item B1.11 requires essentially 100% of the shell welds to be examined. As defined in 10 CFR 50.55a(g)(6)(ii)(A)(2), essentially 100% means more than 90% of the examination volume of each weld where the reduction in coverage is due to interference by another component, or part geometry.

These exams are volumetric as illustrated in the 1989 Edition, ASME Code, Section XI, Figure IWB-2500-1.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-A
Item Number:	B1.11
Description:	Reactor Vessel Lower Shell-to-Head Circumferential Weld
Weld Identification Number:	RCT0001RV0015

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code where 100% means greater than 90% as defined by 10 CFR 50.55a(g)(6)(ii)(A)(2). The accessible area was examined with techniques that have been demonstrated and qualified in accordance with Supplements 4 and 6 of the 1995 Edition, 1996 Addenda of ASME Code, Section XI, Appendix VIII, using the Performance Demonstration Initiative (PDI) protocol. These examinations were performed from both sides of the weld, scanning both parallel to and perpendicular to the weld. The aggregate examination coverage of the weld and base metal areas was approximately 29% of the required examination volume. All indications were within the 1989 Edition, ASME Code, Section XI, acceptance criteria. Compliance with the Code requirements is impractical.

In its response dated February 3, 2003, to the NRC staff's request for additional information (RAI), the licensee stated: "Reactor Vessel welds Nos. RCT0001RV0012WELD, RCT0001RV0013WELD, and RCT0001RV0014WELD were examined with greater than 90% of the examination volume of each weld. Weld no. RV0012 obtained 94% coverage, and weld nos. RV0013 and RV0014 obtained 100% coverage. The results of these examinations were acceptable to ASME Code, Section XI acceptance criteria. There were no service induced degradation indications evaluated for these welds. These three (3) welds are in the beltline area of the reactor vessel. The welds in the subject submittal are not in the beltline region. These welds are in the lower section of the reactor vessel, which operates in lower [neutron] fluence. The acceptability of the welds in the beltline region which achieved a coverage of greater than 90% provides a high degree of confidence that the weld areas which were not able to be examined as described in the subject submittal [licensee's March 5, 2002, application] would not identify any service induced indications."

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject weld.

NRC Staff's Evaluation:

The Code requires 90% volumetric examination of the Reactor Vessel Lower Shell-to-Head Circumferential Weld No. RCT0001RV0015. The design and configuration of the Core Guide Lugs and Flow Stabilizer Remnants prevent 100% ultrasonic (UT) examination of the Code required volume for the subject weld. The licensee performed UT exams from both sides of the subject weld, scanning both parallel and perpendicular to the weld resulting in approximately 29% volumetric coverage. All indications were within ASME Code, Section XI, acceptance criteria.

From the standpoint of protecting the TMI-1 reactor pressure vessel (RPV) against pressurized thermal shock (PTS), the RPV is a weld-limited vessel with respect to the PTS reference temperature (RT_{pts}). The material in the RPV that is most susceptible to radiation induced embrittlement, the limiting material, is the lower shell axial weld SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Reactor Vessel Lower Shell-to-Head Circumferential Weld No.

RCT0001RV0015 because the weld is not the limiting embrittlement weld nor is located in the beltline of the RPV. As stated in the licensee's letter dated February 3, 2003, welds in the beltline (which received essentially 100% UT coverage) are subjected to higher neutron fluence levels than weld no. RCT0001RV0015 and no detectable service-induced flaws were found. Weld no. RCT0001RV0015 experiences a nearly identical operating environment as the RPV beltline, therefore, the reduced coverage is bounded by the essentially 100% coverage of the beltline.

Based on information contained in the licensee's letters dated March 2, 2002, and February 3, 2003, the NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Reactor Vessel Lower Shell-to-Head Circumferential Weld No. RCT0001RV0015 is impractical because the subject component would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.2 Request for Relief No. RR-02-19, Part B

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of the ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-A, Item B1.21 requires essentially 100% coverage of the subject weld. ASME Code, Section XI, Figure IWB-2500-3 illustrates the required examination volume. Code Case N-460, "Alternative Examination Coverage for Class 1 and Class 2 Welds," states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 weld.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-A
Item Number:	B1.21
Description:	Reactor Vessel Lower Head Circumferential Weld
Weld Identification Number:	RCT0001RV0016

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The accessible area was examined with techniques that have been demonstrated and qualified in accordance with Supplements 4 and 6 of the 1995 Edition, 1996 Addenda of

ASME Code, Section XI, Appendix VIII, using the PDI protocol. These examinations were performed from both sides of the weld, scanning both parallel to and perpendicular to the weld. The aggregate examination coverage of the weld and base metal areas was approximately 42% of the required examination volume. These UT examinations did not reveal any recordable or reportable flaws. Compliance with the Code requirements is impractical.

In its February 3, 2003, response to the NRC staff's RAI, the licensee stated: "Reactor Vessel welds Nos. RCT0001RV0012WELD, RCT0001RV0013WELD, and RCT0001RV0014WELD were examined with greater than 90% of the examination volume of each weld. Weld No. RV0012 obtained 94% coverage, and weld Nos. RV0013 and RV0014 obtained 100% coverage. The results of these examinations were acceptable to ASME Code, Section XI acceptance criteria. There were no service induced degradation indications evaluated for these welds. These three (3) welds are in the beltline area of the reactor vessel. The welds in the subject submittal [licensee's March 5, 2002, application] are not in the beltline region. These welds are in the lower section of the reactor vessel, which operates in lower [neutron] fluence. The acceptability of the welds in the beltline region which achieved a coverage of greater than 90% provides a high degree of confidence that the weld areas which were not able to be examined as described in the subject submittal, would not identify any service induced indications."

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject weld.

NRC Staff's Evaluation:

The Code requires 90% volumetric examination of the Reactor Vessel Lower Head Circumferential Weld No. RCT0001RV0016. The design and configuration of the incore instrumentation nozzles, core support lugs and flow stabilizer remnants prevent 100% UT examination of the Code-required volume for the subject weld. The licensee performed UT exams from both sides of the subject weld, scanning both parallel and perpendicular to the weld resulting in approximately 42% volumetric coverage. These UT examinations did not reveal any recordable or reportable flaws.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Reactor Vessel Lower Head Circumferential Weld No. RCT0001RV0016 because the weld is not the limiting embrittlement material or located in the beltline of the RPV. As stated in the licensee's letter dated February 3, 2003, welds in the beltline (which received essentially 100% UT coverage) are subjected to higher neutron fluence levels than weld no. RCT0001RV0016 and no detectable service-induced flaws were found. Weld no. RCT0001RV0016 experiences a nearly identical operating environment as the RPV beltline, therefore, the reduced coverage is bounded by the essentially 100% coverage of the beltline.

Based on information contained in the licensee's March 2, 2002, and February 3, 2003, submittals, the NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Reactor Vessel Lower Head Circumferential Weld No. RCT0001RV0016 is impractical because the subject component would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.3 Request for Relief No. RR-02-19, Part C

Code Requirement: (As stated by the licensee)

10 CFR 50.55a(g)(6)(ii)(A)(2) requires licensees to implement the examination requirements of the 1989 Edition of ASME Code Section XI for Reactor Vessel shell welds. Subsection IWB, Table IWB-2500-1, Examination Category B-A, Item B1.12 requires essentially 100% of the shell welds to be examined. As defined in 10 CFR 50.55a(g)(6)(ii)(A)(2), essentially 100% means more than 90% of the examination volume of each weld where the reduction in coverage is due to interference by another component, or part geometry.

These exams are volumetric as illustrated in the 1989 Edition of the ASME Code, Section XI, Figure IWB-2500-2.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class: 1
Examination Category: B-A
Item Number: B1.12
Description: Reactor Vessel Shell-to-Shell Longitudinal Welds
Weld Identification Number: RCT0001RV0020L and RCT0001RV0021L

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code where 100% means greater than 90% of the weld volume as defined by 10 CFR 50.55a(g)(6)(ii)(A)(2). The accessible area was examined with techniques that have been demonstrated and qualified in accordance with Supplements 4 and 6 of the 1995 Edition, 1996 Addenda of ASME Code, Section XI, Appendix VIII, using the PDI protocol. These examinations were performed from both sides of the welds, scanning both parallel to and perpendicular to the welds. The aggregate examination coverage of the welds and base metal areas was approximately 79% of the required examination volume. These ultrasonic examinations did not reveal any recordable or reportable

flaws within ASME Code, Section XI, 1989 Edition acceptance criteria. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Reactor Vessel Shell-to-Shell Longitudinal Weld Nos. RCT0001RV0020L and RCT0001RV0021L. The design and configuration of the core support lugs prevent 100% UT examination of the Code required volume for the subject welds. The licensee performed UT exams from both sides of the subject welds, scanning both parallel to and perpendicular to the welds resulting in approximately 79% volumetric coverage. These UT examinations did not reveal any recordable or reportable flaws within ASME Code, Section XI, 1989 Edition acceptance criteria.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} value. The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Reactor Vessel Shell-to-Shell Longitudinal Weld Nos. RCT0001RV0020L and RCT0001RV0021L because these welds are not the limiting embrittlement weld or located in the beltline of the RPV.

The NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Reactor Vessel Lower Shell-to-Shell Longitudinal Weld Nos. RCT0001RV0020L and RCT0001RV0021L is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.4 Request for Relief No. RR-02-19, Part D

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of the ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-D, Item B3.90 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-7(b) illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted, provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-D
Item Number:	B3.90
Description:	Inlet Nozzle-to-Reactor Vessel Shell Welds
Weld Identification Number:	RCT0001RV0001N RCT0001RV0003N RCT0001RV0004N RCT0001RV0006N

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. The inlet nozzle-to-shell welds were examined from the shell side to the extent possible. These examinations were performed from both sides of the welds, scanning both parallel to and perpendicular to the welds. The aggregate examination coverage of the welds and base metal areas was approximately 80% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Inlet Nozzle-to-Reactor Vessel Shell Weld Nos. RCT0001RV0001N, RCT0001RV0003N, RCT0001RV0004N, and RCT0001RV0006N. The design and configuration of the Inlet nozzle boss and nozzle radius prevent 100% UT examination of the Code required volume for the subject welds. The licensee performed UT exams from both sides of the subject welds, scanning both parallel to and perpendicular to the welds, resulting in approximately 80% volumetric coverage. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Inlet Nozzle-to-Reactor Vessel Shell Weld Nos. RCT0001RV0001N, RCT0001RV0003N, RCT0001RV0004N, and RCT0001RV0006N because these welds

are not the limiting embrittlement material or located in the beltline of the RPV. Any degradation patterns that exist would have been observed in the obtained 80% volumetric coverage.

The NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Inlet Nozzle-to-Reactor Vessel Shell Weld Nos. RCT0001RV0001N, RCT0001RV0003N, RCT0001RV0004N, and RCT0001RV0006N is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.5 Request for Relief No. RR-02-19, Part E

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-D, Item B3.90 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-7(b) illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-D
Item Number:	B3.90
Description:	Core Flood Nozzle-to-Shell Welds
Weld Identification Number:	RCT0001RV0007N RCT0001RV0008N

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The core flood nozzle-to-shell welds were examined from the shell side to the extent possible. These examinations were performed from both sides of the weld, scanning both parallel and perpendicular to the weld. The aggregate examination coverage of the weld and base metal areas was approximately 82% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Core Flood Nozzle-to-Shell Weld Nos. RCT0001RV0007N and RCT0001RV0008N. The design and configuration of the flow restrictor located in the bore of the core flood nozzle and the radius bend between the RPV shell and bore of the core flood nozzle prevent 100% UT examination of the Code required volume for the subject welds. The licensee performed UT exams from both sides of the subject weld, scanning both parallel to and perpendicular to the welds, resulting in approximately 82% volumetric coverage. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Core Flood Nozzle-to-Shell Weld Nos. RCT0001RV0007N and RCT0001RV0008N because these welds are not the limiting embrittlement material or located in the beltline of the RPV. Any degradation patterns that exist would have been observed in the obtained 82% volumetric coverage.

The NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Core Flood Nozzle-to-Shell Weld Nos. RCT0001RV0007N and RCT0001RV0008N is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.6 Request for Relief No. RR-02-19, Part F

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-D, Item B3.100 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-7(b) illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted, provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class: 1
Examination Category: B-D
Item Number: B3.100
Description: Core Flood Nozzle Inner Radius Sections
Weld Identification Number: RCT0001RV0007NI
RCT0001RV0008NI

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The core flood nozzle-to-shell welds were examined from the shell side to the extent possible. These examinations were performed from both sides of the welds scanning both parallel to and perpendicular to the welds. The aggregate examination coverage of the welds and base metal areas was approximately 52% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Core Flood Nozzle-to-Shell Weld Nos. RCT0001RV0007NI and RCT0001RV0008NI. The design and configuration of the flow restrictor located inside the bore of the core flood nozzle prevent 100% UT examination of the Code required volume for the subject welds. The licensee performed UT exams from both sides of the subject welds, scanning both parallel to and perpendicular to the weld resulting in approximately 52% volumetric coverage. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Core Flood Nozzle Inner Radius Section Weld Nos. RCT0001RV0007NI and RCT0001RV0008NI because these welds are not the limiting embrittlement material or located in the beltline of the RPV. Any degradation patterns that exist would have been observed in the obtained 52% volumetric coverage.

The NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Core Flood Nozzle Inner Radius Section Weld Nos. RCT0001RV0007NI and RCT0001RV0008NI is impractical because the subject

components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.7 Request for Relief No. RR-02-19, Part G

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-J, Item B9.11 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-8 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-J
Item Number:	B9.11
Description:	Core Flood Pipe-to-Safe End Welds
Weld Identification Number:	CF0001 CF0020

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The core flood pipe-to-safe end welds were examined from the safe end and pipe sides to the extent possible. These examinations were performed from both sides of the weld, scanning both parallel to and perpendicular to the welds. The aggregate examination coverage of the welds and base metal areas for welds CF0001 and CF0020 was approximately 89% and 71%, respectively, of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Core Flood Pipe-to-Safe End Weld Nos. CF0001 and CF0020. The contour of the safe end restricts intimate contact of the UT transducer and the surface 100% of the time. The licensee performed UT exams from both sides of the subject welds, scanning both parallel to and perpendicular to the welds, resulting in approximately 89% and 71% volumetric coverage for welds CF0001 and CF0020, respectively. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Core Flood Pipe-to-Safe End Weld Nos. CF0001 and CF0020, because these welds are not the limiting embrittlement material or located in the beltline of the RPV. Any degradation patterns that exist would have been observed in the obtained 89% and 71% volumetric coverages for each respective weld.

The NRC staff concludes that the Code requirement to volumetrically examine essentially 100% of the Core Flood Pipe-to-Safe End Weld Nos. CF0001 and CF0020 is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.8 Request for Relief No. RR-02-19, Part H

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-F, Item B5.10 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-8 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-F
Item Number:	B5.10
Description:	Core Flood Nozzle-to-Safe End Welds
Weld Identification Number:	RCT0001RV0009BM and RCT0001RV0010BM

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. The core flood nozzle-to-safe end welds were examined from the safe end and nozzle side to the extent possible. These examinations were performed from both sides of the welds, scanning both parallel to and perpendicular to the welds. The contour of the safe end restricts intimate contact (lift off) with the surface of the transducer face. The aggregate examination coverage of the welds and base metal areas for welds RCT0001RV0009BM and RCT0001RV0010BM was approximately 80% and 84%, respectively, of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Core Flood Nozzle-to-Safe End Weld Nos. RCT0001RV0009BM and RCT0001RV0010BM. The contour of the safe end restricts intimate contact of the UT transducer and the surface 100% of the time. The licensee performed UT exams from both sides of the subject welds scanning both parallel to and perpendicular to the welds resulting in approximately 80% and 84% volumetric coverage for welds RCT0001RV0009BM and RCT0001RV0010BM, respectively. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Core Flood Nozzle-to-Safe End Weld Nos. RCT0001RV0009BM and RCT0001RV0010BM because these welds are not the limiting embrittlement material or located in the beltline of the RPV. Any degradation patterns that exist would have been observed in the obtained 80% and 84% volumetric coverages for each respective weld.

The NRC staff concludes that the Code requirement to volumetrically examine the Core Flood Nozzle-to-Safe End Weld Nos. RCT0001RV0009BM and RCT0001RV0010BM to essentially 100% volumetric coverage is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.9 Request for Relief No. RR-02-19, Part I

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-A, Item B1.40 requires essentially 100% coverage of the subject weld. ASME Code, Section XI, Figure IWB-2500-5 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-A
Item Number:	B1.40
Description:	Reactor Vessel Head-to-Flange Weld
Weld Identification Number:	RCT0001/RH0001

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The configuration of the head-to-flange interface only permits the weld to be scanned from the head side. The aggregate examination coverage of the weld and base metal areas for weld RCT0001/RH0001 was approximately 85% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject weld.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Reactor Vessel Head-to-Flange Weld No. RCT0001/RH0001. The flange configuration and lifting lugs restrict intimate contact of the UT transducer and the surface above the flange weld, as well as prevent the UT transducer from accessing all areas necessary for complete coverage. The licensee could only perform UT exams from the head side of the weld, resulting in approximately 85% volumetric coverage for weld RCT0001/RH0001. These

UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI. Any degradation patterns that exist would have been observed in the obtained 85% volumetric coverage of the weld.

The NRC staff concludes that the Code requirement to volumetrically examine the Reactor Vessel Head-to-Flange Weld No. RCT0001/RH0001 to essentially 100% volumetric coverage is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.10 Request for Relief No. RR-02-19, Part J

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-B, Item B2.40 requires essentially 100% coverage of the subject weld. ASME Code, Section XI, Figure IWB-2500-6 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 weld.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-B
Item Number:	B2.40
Description:	Steam Generator Tubesheet-to-Head Weld
Weld Identification Number:	RCH0001BSG0012

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The configuration of the head-to-flange interface only permits the weld to be scanned from the head side. The aggregate examination coverage of the weld and base metal areas for weld RCH0001BSG0012 was approximately 74% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject weld.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Steam Generator Tubesheet-to-Head Weld No. RCH0001BSG0012. The steep entry angle from the tubesheet side into the weld causes the UT transducer to lift off from the surface and restricts the transducer's ability to move to areas necessary for 100% inspection coverage. The licensee performed UT exams resulting in approximately 74% volumetric coverage for weld RCH0001BSG0012. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI. Any degradation patterns that exist would have been observed in the obtained 74% volumetric coverage of the weld.

The NRC staff concludes that the Code requirement to volumetrically examine the Steam Generator Tubesheet-to-Head Weld No. RCH0001BSG0012 to essentially 100% volumetric coverage is impractical, because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.11 Request for Relief No. RR-02-19, Part K

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-D, Items B3.130 and B3.140, require essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-7(a) illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-D
Item Number:	B3.130, B3.140
Description:	Steam Generator Nozzle-to-Vessel Welds and Inner Radius Welds
Weld Identification Number:	RCH0001BSG0008N, RCH0001BSG0009N

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The configuration of the barrel type nozzle only permits the weld to be scanned from the vessel side. The aggregate examination coverage of the weld and base metal areas for weld RCH0001BSG0008N was approximately 47% of the required examination volume while 79% of the required examination volume of the nozzle inner radius was examined. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Steam Generator Nozzle-to-Vessel Weld Nos. RCH0001BSG008N and RCH0001BSG009N. The nozzle-to-vessel interface radius is too small, causing the transducer to lift off from the surface. Also, the configuration of the barrel type nozzle restricts the transducer's ability to move to areas necessary for complete coverage. The licensee performed UT exams resulting in approximately 47% volumetric coverage for weld RCH0001BSG008N and 79% volumetric coverage of the nozzle inner radius weld, RCH0001BSG009N. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI. Any degradation patterns that exist would have been observed in the obtained 47% and 79% volumetric coverage of the subject nozzle-to-vessel weld and nozzle inner radius weld.

The NRC staff concludes that the Code requirement to volumetrically examine the Steam Generator Nozzle-to-Vessel Weld Nos. RCH0001BSG008N and RCH0001BSG009N to essentially 100% volumetric coverage is impractical, because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.12 Request for Relief No. RR-02-19, Part L

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-F, Item B5.40 requires essentially 100% coverage of the subject weld. ASME Code, Section XI, Figure IWB-2500-8 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 weld.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the code is impractical.

Identification of Components:

Code Class: 1
Examination Category: B-F
Item Number: B5.40
Description: Pressurizer Nozzle-to-Safe End Weld
Weld Identification Number: RCT0002PR0021BM

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The configuration of the remaining portion of the nozzle restraint creates interference on approximately 180 degrees of the examination area. Also, the remaining portion of the restraint is just above the weld area and restricts the transducer's ability to move to areas necessary to fully examine the required volume. The aggregate examination coverage of the weld and base metal areas for weld RCT0002PR0021BM was approximately 87% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject weld.

NRC Staff's Evaluation:

The Code requires 100% volumetric examination of the Pressurizer Nozzle-to-Safe End Weld No. RCT0002PR0021BM. The pressurizer nozzle restraint creates interference on approximately 180 degrees of the examination area. The remaining portion of the restraint is just above the weld area and restricts the transducer's ability to move to areas necessary to fully examine the required volume. The licensee performed UT exams resulting in approximately 87% volumetric coverage for weld RCT0002PR0021BM. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI. Any degradation patterns that exist would have been observed in the obtained 87% volumetric coverage of the subject weld.

The NRC staff concludes that the Code requirement to volumetrically examine the Pressurizer Nozzle to Safe End Weld No. RCT0002PR0021BM to essentially 100% volumetric coverage is impractical, because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.13 Request for Relief No. RR-02-19, Part M

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-K-1, Item B10.20 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-15 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-K-1
Item Number:	B10.20
Description:	Reactor Coolant Pump Integral Attachment Welds
Weld Identification Number:	RCP0001BRC0279WA, RCP0001BRC0280WA, RCP0001BRC0281WA

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The reactor coolant pump integral attachment welds were examined to the extent possible as the pump motor stand and insulation structural steel work caused restriction to all the necessary surface area for UT. The aggregate examination coverage of the welds and base metal areas for welds RCP0001BRC0279WA and RCP0001BRC0280WA was approximately 50% each, while weld RCP0001BRC0281WA received 83% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Reactor Coolant Pump Integral Attachment Weld Nos. RCP0001BRC0279WA, RCP0001BRC0280WA,

and RCP0001BRC0281WA. The remaining portion of the restraint is just above the weld area and restricts the transducer's ability to move to areas necessary to fully examine the required volume. Also, the configuration of the barrel type nozzle restricts the transducer's ability to move to areas necessary for complete coverage. The licensee performed UT exams resulting in approximately 50% volumetric coverage for welds RCP0001BRC0279WA and RCP0001BRC0280WA, while weld RCP0001BRC0281WA received 83% volumetric UT coverage. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI. Any degradation patterns that exist would have been observed in the obtained volumetric coverage of the subject welds and base metal.

The NRC staff concludes that the Code requirement to volumetrically examine the Reactor Coolant Pump Integral Attachment Weld Nos. RCP0001BRC0279WA, RCP0001BRC0280WA, and RCP0001BRC0281WA to essentially 100% volumetric coverage is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.14 Request for Relief No. RR-02-19, Part N

Code Requirement:

The TMI-1 second 10-year interval ISI program plan is prepared to the 1986 Edition of ASME Code, Section XI. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-K-1, Item B10.10 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-15 illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld, may be accepted provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-K-1
Item Number:	B10.10
Description:	Pressurizer Integral Attachment Welds
Weld Identification Number:	RCT0002PR0022WA, RCT0002PR0023WA, RCT0002PR0024WA, RCT0002PR0025WA, RCT0002PR0026WA, RCT0002PR0027WA, RCT0002PR0028WA, RCT0002PR0029WA

Licensee's Basis for Requesting Relief:

It is not possible to obtain 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted provided the reduction in coverage for that weld is less than 10%. The pressurizer integral attachment welds were examined to the extent possible as the existing structural support I-beam caused restriction to all the necessary surface area for UT. The I-beam obstructs the access to the portion of the attachment welds under the lug and the supporting surface of the I-beam. The aggregate examination coverage of the weld and base metal areas for welds RCT0002PR0022WA and RCT0002PR0023WA were approximately 71% each, while welds RCT0002PR0024WA and RCT0002PR0025WA received 55% of the required examination volume. Compliance with the Code requirements is impractical. The aggregate examination coverage of the welds and base metal areas for welds RCT0002PR0026WA and RCT0002PR0027WA was approximately 0% each as the area is completely restricted. The aggregate examination coverage of the welds and base metal areas for weld RCT0002PR0028WA was approximately 55% while weld RCT0002PR0029WA received 17% coverage. Compliance with the Code requirements is impractical.

In its February 3, 2003, response to the NRC staff's RAI, the licensee stated: "With regard to the welds discussed in the subject submittal, and indications, which were identified and found to be within the ASME Code, Section XI, acceptance criteria, none of the indications were the result of service-induced degradation."

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Pressurizer Integral Attachment Weld Nos. RCT0002PR0022WA, RCT0002PR0023WA, RCT0002PR0024WA, RCT0002PR0025WA, RCT0002PR0026WA, RCT0002PR0027WA, RCT0002PR0028WA, and RCT0002PR0029WA. The I-beam restricts or completely obstructs UT examination. The licensee performed UT exams resulting in less than required coverage. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI. Any degradation patterns that exist would have been observed in the obtained volumetric coverage of welds nos. RCT0002PR0022WA, RCT0002PR0023WA, RCT0002PR0024WA, RCT0002PR0025WA, RCT0002PR0028WA, and RCT0002PR0029WA. The argument for absence of service-induced indications in the aforementioned welds can be applied to weld nos. RCT0002PR0026WA and RCT0002PR0027WA.

Based on the information submitted by licensee letters dated March 5, 2002, and February 3, 2003, the NRC staff concludes that the Code requirement to volumetrically examine the Pressurizer Integral Attachment Weld Nos. RCT0002PR0022WA, RCT0002PR0023WA, RCT0002PR0024WA, RCT0002PR0025WA, RCT0002PR0026WA, RCT0002PR0027WA, RCT0002PR0028WA, and

RCT0002PR0029WA to essentially 100% volumetric coverage is impractical, because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

3.15 Request for Relief No. RR-02-20

Code Requirement:

The TMI-1 third 10-year interval ISI program plan is prepared to the 1995 Edition of ASME Code, Section XI with Addenda through 1996. ASME Code, Section XI, Subsection IWB, Table IWB-2500-1, Examination Category B-D, Item B3.90 requires essentially 100% coverage of the subject welds. ASME Code, Section XI, Figure IWB-2500-7(a) illustrates the required examination volume. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. Applying Code Case N-460 results in a required examination volume of 90% of the subject Class 1 welds.

Licensee's Code Relief Request:

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested on the basis that conformance with the Code is impractical.

Identification of Components:

Code Class:	1
Examination Category:	B-D
Item Number:	B3.90
Description:	Outlet Nozzle-to-Reactor Vessel Shell Welds
Weld Identification Number:	RCT0001PR0002N and RCT0001PR0005N

Licensee's Basis for Requesting Relief:

It is not possible to obtain essentially 100% of the examination volume required by the Code. Code Case N-460 states that a reduction in examination coverage on any Class 1 or Class 2 weld may be accepted, provided the reduction in coverage for that weld is less than 10%. The core outlet nozzle-to-shell welds were examined from the shell side to the extent possible. The aggregate examination coverage of the welds and base metal areas was approximately 56% of the required examination volume. Compliance with the Code requirements is impractical.

Licensee's Proposed Alternative Examination: (As stated by the licensee)

No alternate examinations are proposed in lieu of ultrasonic examination of the inaccessible portion of the subject welds.

NRC Staff's Evaluation:

The Code requires essentially 100% volumetric examination of the Outlet Nozzle-to-Shell Weld Nos. RCT0001PR0002N and RCT0001PR0005N. The design and

configuration of the outlet nozzle boss prevents 100% UT examination of the Code required volume for the subject welds. The contour of the nozzle radius restricts the transducer's ability to scan the welds and adjacent base material from the vessel shell. The licensee performed UT exams from both sides of the subject welds, scanning both parallel to and perpendicular to the welds resulting in approximately 56% volumetric coverage. These UT examinations did not reveal any flaws that exceed the acceptance criteria of ASME Code, Section XI.

From the standpoint of protecting the TMI-1 RPV against PTS, the RPV is a weld-limited vessel with respect to the RT_{pts} . The material in the RPV that is most susceptible to radiation-induced embrittlement, the limiting material, is the Lower Shell Axial Weld No. SA-1526. The volumetric exams performed provide reasonable assurance of structural integrity of the Outlet Nozzle-to-Reactor Vessel Shell Weld Nos. RCT0001PR0002N and RCT0001PR0005N because these welds are not the limiting embrittlement material nor are they located in the beltline of the RPV. Any degradation patterns that exist would have been observed in the obtained 56% volumetric coverage.

The NRC staff concludes that the Code requirement to volumetrically examine the Outlet Nozzle to Reactor Vessel Shell Weld Nos. RCT0001PR0002N and RCT0001PR0005N to essentially 100% volumetric coverage is impractical because the subject components would have to be redesigned and refabricated. The imposition of the Code requirement would result in an undue burden on the licensee.

4.0 CONCLUSION

For Relief Requests RR-02-19 and RR-02-20, the NRC staff concludes that Code requirements are impractical and the volumetric examinations performed provide reasonable assurance of structural integrity for the subject components. Giving due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility, this relief will not endanger life or property or the common defense and security and is otherwise in the public interest. Therefore, the licensee's requests for relief for the second 10-year interval for RR-02-19, parts A through N, and for the third 10-year interval for RR-02-20, are granted pursuant to 10 CFR 50.55a(g)(6)(i). Relief Requests RR-02-19 and RR-02-20 are summarized in Table 1, attached.

Attachment: Summary of Relief Requests

Principal Contributors: C. Long
T. Colburn

Date: June 6, 2003

Three Mile Island, UNIT NO. 1
 Second and Third 10-Year ISI Interval

TABLE 1
 SUMMARY OF RELIEF REQUESTS

Relief Request Number	TLR Sec.	System or Component	Exam Category	Item No.	Volume or Area to be Examined	Required Method	Licensee Proposed Alternative	Relief Request Status
RR-02-19 Part A	2.1	Reactor Pressure Vessel	B-A	B1.11	Lower Shell to Head Circumferential Weld	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part B	2.2	Reactor Pressure Vessel	B-A	B1.21	Reactor Vessel Lower Head Circumferential Weld	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part C	2.3	Reactor Pressure Vessel	B-A	B.1.12	Reactor Vessel Shell to Shell Longitudinal Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part D	2.4	Reactor Pressure Vessel	B-D	B3.90	Inlet Nozzle to Reactor Vessel Shell Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part E	2.5	Reactor Pressure Vessel	B-D	B3.90	Core Flood Nozzle to Shell Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part F	2.6	Reactor Pressure Vessel	B-D	B3.100	Core Flood Nozzle Inner Radius Sections	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part G	2.7	Reactor Pressure Vessel	B-J	B9.11	Core Flood Pipe to Safe End Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part H	2.8	Reactor Pressure Vessel	B-F	B5.10	Core Flood Nozzle to Safe End Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part I	2.9	Reactor Vessel Head	B-A	B1.40	Reactor Vessel Head to Flange Weld	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part J	2.10	Steam Generator	B-B	B2.40	Steam Generator Tubesheet to Head Weld	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part K	2.11	Steam Generator	B-D	B3.130, B3.140	Steam Generator to Vessel Welds	Volumetric Examination	None	Authorized per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part L	2.12	Pressurizer	B-F	B5.40	Pressurizer Nozzle to Safe End Weld	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part M	2.13	Reactor Coolant Pump	B-K-1	B10.20	Reactor Coolant Pump Integral Attachment Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-19 Part N	2.14	Pressurizer	B-K-1	B10.10	Pressurizer Integral Attachment Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)
RR-02-20	3.1	Reactor Pressure Vessel	B-D	B3.90	Outlet Nozzle to Reactor Vessel Shell Welds	Volumetric Examination	None	Granted per 10 CFR 50.55a(g)(6)(i)

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