UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

June 22, 2012

Mr. Joseph E. Pacher
Vice President R.E. Ginna Nuclear Power Plant
R.E. Ginna Nuclear Power Plant, LLC
1503 Lake Road
Ontario, NY 14519

SUBJECT: R.E. GINNA NUCLEAR POWER PLANT – RE: INSERVICE INSPECTION PROGRAM RELIEF REQUESTS NOS. ISI-02 AND ISI-03 (TAC NOS. ME5248 AND ME5249)

Dear Mr. Pacher:

By letter dated December 16, 2010, (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103620105), as supplemented by letters dated July 29, 2011 (ADAMS Accession No. ML11215A012) and March 16, 2012, (ADAMS Accession No. ML12081A1119), and in an email dated May 7, 2012, (ADAMS Accession No. ML121290433), R.E. Ginna Nuclear Power Plant, LLC (the licensee) requested U. S. Nuclear Regulatory Commission's (NRC's) approval of its Fourth 10-Year Inservice Inspection (ISI) Interval Program relief requests ISI-02 and ISI-03 for R.E. Ginna Nuclear Power Plant (Ginna). These requests were submitted in accordance with 10 CFR 50.55a(g)(6)(i) and are based on impracticality of obtaining the required inspection coverage.

The NRC staff has reviewed the licensee's submittal and concludes that the ASME Code examination coverage requirements are impractical for the welds listed in the relief requests ISI-02 and ISI-03. Based on the volumetric coverage obtained for welds other than Weld H, Weld J, and Weld PL-FW-XIII, the NRC staff concludes that, if significant service-induced degradation were occurring, there is reasonable assurance that evidence of it would have been detected by the examinations that were performed. In its letter dated March 16, 2012, the licensee made commitments to re-inspect Weld H, Weld J, and Weld PL-FW-XIII no later than the end of the 2014 refueling outage to satisfy the Fourth 10-year ISI examination requirements. Therefore, for the items in relief requests ISI-02 and ISI-03 relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i), for the Fourth 10-year ISI interval at Ginna Nuclear Power Plant.

The NRC staff concludes that granting relief requests ISI-02 and ISI-03 for the Fourth 10-year ISI interval, 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 given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other American Society for Mechanical Engineers (ASME) Code, Section XI requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact Mohan Thadani, the NRC's Project Manager for Ginna at (301) 415-1476 or email mohan.thadani@nrc.gov.

Sincerely,

Douglas V Pickett for

George Wilson, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-244

Enclosure:
As stated

cc w/encl: Distribution via Listserv

UNITED STATES
NUCLEAR REGULATORY COMMISSION
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SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELIEF REQUESTS NOS. ISI-02 AND ISI-03

FOURTH 10-YEAR INSERVICE INSPECTION INTERVAL

R.E. GINNA NUCLEAR POWER PLANT

R.E. GINNA NUCLEAR POWER PLANT, LLC

DOCKET NO. 50-244

1.0 INTRODUCTION

By letter dated December 16, 2010, (Agencywide Documents Access and Management System (ADAMS) Accession Number ML103620105), as supplemented by letters dated July 29, 2011 (ADAMS Accession No. ML11215A012) and March 16, 2012, (ADAMS Accession No. ML12081A1119), and in an email dated May 7, 2012, (ADAMS Accession No. ML121290433), R.E. Ginna Nuclear Power Plant, LLC (the licensee) requested U. S. Nuclear Regulatory Commission's (NRC's) approval of its Fourth 10-Year Inservice Inspection (ISI) Interval Program relief requests ISI-02 and ISI-03 for R.E. Ginna Nuclear Power Plant (Ginna). These requests were submitted in accordance with 10 CFR 50.55a(g)(6)(i) and are based on impracticality of obtaining the required inspection coverage.

2.0 REGULATORY REQUIREMENTS

ISI of the American Society of Mechanical Engineers (ASME) Code Class 1, 2, and 3 components is to be performed in accordance with Section XI of the ASME Boiler and Pressure Vessel Code (ASME Code), and applicable addenda, as required by Title 10 of the *Code of Federal Regulations* (10 CFR) 50.55a(g), except where specific relief has been granted by the Commission pursuant to 10 CFR 50.55a(g)(6)(i). The regulation 10 CFR 50.55a(a)(3) states that alternatives to the requirements of paragraph (g) may be used, when authorized by the 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) shall meet the requirements, except the design and access provisions and the preservice examination requirements, set forth in the ASME Code, Section XI, to the extent practical within the limitations of design, geometry, and materials of construction of the

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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, which was incorporated by 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 proposed relief is sought for the fourth 10-year ISI interval for Ginna which began on January 1, 2000 and ended on December 31, 2009.

3.0 EVALUATION

3.1 Relief Request ISI-02

3.1.1 Applicable Code Edition and Addenda

The code of record for the fourth 10-year ISI program at Ginna, which began on January 1, 2000 and ended on December 31, 2009, was the 1995 Edition/1996 Addenda of the ASME Code, Section XI. Additionally, the 1995 Edition/1996 Addenda was used for the ASME Code, Section XI, Appendix VIII examinations. The licensee noted in ISI-02 that the ASME Code, Appendix VIII was implemented in accordance with the schedule specified in 10 CFR 50.55a which occurred in the Ginna Station fourth ISI Inspection interval. All the welds addressed in ISI-02 were examined after the applicable ASME Section XI, Appendix VIII supplement became effective.

3.1.2 Applicable Code Requirement

ASME Section XI, Sub-Article IWB-2500 states in part, "Components shall be examined and tested as specified in Table IWB-2500-1." Table IWB-2500-1 requires an examination of applicable Class 1 pressure retaining welds, which includes essentially 100 percent of weld length once during the ten year interval for the following ASME Code Categories:

B-F, Item Number B5.70
B-J, Item Number B9.11
B-J, Item Number B9.31
B-M-1, Item Number B12.40

ASME Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds*, as an alternative approved for use by the NRC in Regulatory Guide (RG) 1.147, Revision 16, *Inservice Inspection Code Case Acceptability* (RG 1.147), states that a reduction in examination coverage due to impart geometry or interference for any Class 1 and 2 weld is acceptable provided that the reduction is less than 10 percent, i.e., greater than 90 percent examination coverage is obtained. Ginna has adopted ASME Code Case N-460 in their ISI Program Plan.

3.1.3 Components for Which Relief is Requested

ASME Code Class:	Class 1
Examination Category:	B-F, B-J, B-M-1
Item Number:	B-5.70, B9.11, B9.31 and B12.40

Cat	Item Number	Summary No.	Component ID	Dia (in)	Thk (in)	Matl	ASME Code Coverage	Description
B-F	B5.70	I007190	NSE-4R	38	4.3	CS/CrNi/SS (690)	42%	Steam Generator Nozzle to Safe-end
B-F	B5.70	I006990	NSE-3R	38	4.3	CS/CrNi/SS (690)	40.5%	Steam Generator Nozzle to Safe-end
B-J	B9.11	I007000	PL-FW-III-R	36	3.74	CCSS/SS	0/10*	Elbow to Safe-end
B-J	B9.11	I007200	PL-FW-X-R	36	3.74	CCSS/SS	0/10*	Safe-end to elbow
B-J	B9.11	I012000	PL-FW-XIII	31	2.5	CSS/CSS	0**	Elbow to pump
B-J	B9.11	I012100	PL-FW-VI	29	2.5	SS/CSS	50	Pump to pipe
B-J	B9.11	I013500	PL-FW-XV	31	2.4	CSS/CSS	40.5	Elbow to pump
B-J	B9.11	I013600	PL-FW-VIII	31	2.5	CSS/SS	50	Pump to pipe
B-J	B9.11	I014500	D	10	1.0	SS	50	Pipe to nozzle
B-J	B9.11	I028900	A	10	1.0	SS	50	Valve to pipe
B-J	B9.11	I029400	B	10	1.0	SS	49.5	Pipe to valve
B-J	B9.11	I030300	CSW-5	10	1.0	SS	50	Tee to nozzle
B-J	B9.11	I030400	A	10	1.0	SS	50	Nozzle to pipe
B-J	B9.11	I030700	C	10	1.0	SS	49.5	Valve to pipe
B-J	B9.11	I034300	H	10	1.0	SS	50	Pipe to valve
B-J	B9.11	I035900	H	10	1.0	SS	50	Pipe to valve
B-J	B9.11	I036200	J	6.5	0.719	SS	50	Valve to pipe
B-J	B9.31	I011000	PL-FW-II	10	2.5	SS	50	10" Branch weld
B-M-1	B9.31	I059200	V-720-1 (body weld)	10	1.36	SS	50	10" Valve
B-M-1	B12.40	I059205	V-720-2 (body weld)	10	1.36	SS	50	10" Valve

*ASME Code Coverage was 0 percent; best effort coverage was 10 percent.
**Incorrect procedure used. No ASME Code coverage can be credited at this time.

3.1.4 Licensee Basis for Relief (as stated)

In order to scan all of the required volume for this weld, the components would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications (other than geometric indications) found during the inspection of these welds. Based on the components designed configuration, the available coverage will not meet the requirements of the ASME Code or Code Case N-460.

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested for the components listed in [the table above] on the basis that the required examination coverage of "essentially 100 percent" is impractical due to physical obstructions and the limitations imposed by design, geometry, and materials of construction. Ginna LLC utilized examination techniques qualified to meet the requirements of ASME Section XI, Appendix VIII, as required in 10 CFR 50.55a(g)(6)(ii)(c), that achieved the maximum practical amount of coverage obtainable within the limitations imposed by the design of the components and examination techniques. Additionally, VT-2 examinations are performed on the subject components of the Reactor Coolant Pressure Boundary during system pressure tests on a refueling outage frequency. Those examinations were completed each refueling outage and no evidence of leakage was identified for these components.

Further, the mandated requirement in 10 CFR.50.55a(b)(2)(xv)(A)(2), which states, "Where examination from both sides is not possible on austenitic welds, full coverage credit from a single side may be claimed only after completing a successful single sided Appendix VIII demonstration using flaw on the opposite side of the weld." The Appendix VIII techniques applied at R. E. Ginna Nuclear Power Plant (GNPP), (PDI-UT-2) are not qualified for "Detection or length sizing of circumferentially oriented flaw indications when only single side access is available and the flaw is located on the far side of the weld."

Based on the design configuration of the components and available examinations techniques , [R.E..Ginna Nuclear Power Plant LLC] was not able to achieve greater than 90% Code coverage of the required examination volume for the components listed above [without] major modifications to the components.

3.1.5 Licensee's Proposed Alternative Examination

The licensee stated that no alternative examinations were performed for the welds during the fourth inspection interval. The use of radiography (RT) as an alternate volumetric examination for all the above listed components is not practical due to geometric configuration and to the limited ability of RT to detect inservice flaws. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

IWB-2500, Table IWB-2500-1, Examination Category B-P System Leakage Tests and VT-2 visual examinations performed for each refueling outage provide additional assurance of

pressure boundary integrity. In addition to the above ASME Code required examinations (volumetric, pressure test and applicable surface examinations), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld it would be detected and proper action taken. Specifically, system leak rate limitations imposed by Technical Specification 3.4.13, "RCS Operational Leakage," as well as reactor building normal sump rate monitoring, provide additional assurance that any leakage would be detected prior to gross failure of the component. The identified welds were inspected by volumetric and surface nondestructive examination (NDE) methods during construction and verified to be free from unacceptable fabrication defects.

3.1.6 Duration of Proposed Alternative

The proposed alternative is requested for the fourth 10-year ISI interval for Ginna which began on January 1, 2000 and ended on December 31, 2009.

3.1.7 Staff Evaluation

The ASME Code requires an examination of applicable Class 1 pressure retaining welds, which includes essentially 100 percent of weld length once during the ten year interval for the ASME Code Categories B-F (Item Number B5.70), B-J (Item Number B9.11), B-J (Item Number B9.31) and B-M-1 (Item Number B12.40). However, for the subject welds at Ginna, complete examinations are restricted for various reasons. The details for the welds in each ASME Code Categories are discussed below.

ASME Code Category B-F, Pressure Retaining Dissimilar Metal Welds in Vessel Nozzles, Item No. B5.70 Nozzle to Safe End Welds, NSE-3R (Inlet) and NSE-4R (Outlet)

The licensee stated that the "B" steam generator inlet/outlet nozzle to safe-end welds are accessible only from the nozzle side based on the designed configuration. These welds are dissimilar metal welds consisting of a stainless steel clad-carbon steel nozzle with Alloy 52/152 weld materials to a stainless steel safe-end. The NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Code, Section XI by the Performance Demonstration Initiative (PDI) for examination of the steam generator (SG) nozzle welds for single sided examination. It states in 10 CFR 50.55a(b)(2)(xv)(A)(2), in part, "Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld." The approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

The licensee stated that during the ultrasonic examination of the welds, less than 90 percent coverage of the required examination volume was obtained. In order to achieve additional coverage, the components would have to be redesigned to allow for scanning from both sides of the weld, which is impractical. As shown on the sketches and technical descriptions included in the licensee's submittal, examinations of the subject piping welds have been completed to the extent practical resulting in 42 percent for Weld NSE-4R and 40.5 percent for Weld NSE-3R of the ASME Code-required examination volume. The percentage achieved represents the aggregate coverage from all scans performed on the weld and adjacent base material. The

examinations were performed using manual scans with 45-degree shear wave and 45- and 60-degree refracted longitudinal wave scans perpendicular and parallel to the weld in one axial direction and two circumferential directions and 0-degree longitudinal waves. Recent studies[1,2] recommend the use of both shear and L-waves to obtain the best detection results, with minimum false calls, in austenitic welds. The licensee stated that no recordable indications were found during the inspections of these welds.

In its first request for additional information (RAI), the NRC staff expressed concern that the reductions in claimed coverage due to the surface condition of the components and inability to maintain contact during the exam were determined in an arbitrary fashion. In its response, the licensee explained that the coverage limitations were determined by observing the ultrasonic signal present during the examination, and areas producing signals indicative of inadequate coverage were considered coverage limitations. The licensee noted that the process used to determine the reduction in coverage was documented in the qualified ultrasonic testing (UT) examination procedure, PDI-UT-10. The licensee also noted that these exams met the PDI-UT-10 requirement for the surface condition to be either machined or ground smooth to a root mean square (RMS) finish of approximately 250 RMS.

In its RAI, the NRC staff acknowledged that this is a difficult examination; however the NRC staff questioned whether it would be possible to obtain greater coverage through various options including the use of phased array ultrasonic inspection (PAUT) employing site-specific mockups, if necessary, and/or overlaying the welds. Therefore, the NRC staff asked the licensee to address (a) whether or not it could have obtained greater coverage using PAUT, (b) if they could have obtained greater coverage with PAUT, why that was not employed in the fourth interval, and (c) what they will do for future examinations to maximize ASME Code coverage. The licensee responded that at the time that these exams were performed in 2008, fleet and site experience with PAUT was insufficient to provide confidence in the technique. Therefore the licensee made the decision to proceed with conventional UT for these dissimilar metal (DM) welds. Additionally, the licensee believed that, due to the size of the PAUT transducers, the PAUT techniques would have similar scan limitations. The licensee stated that "the fourth Interval ISI Program examinations were performed fully to the extent possible taking into account all noted limitations. The limited examination scanning did cover the wetted inner diameter (ID) surface of the dissimilar metal interface and the limited examinations results were no recordable indications noted. These DM welds are constructed with Alloy 52/152 filler metal that is resistant to Primary Water Stress Corrosion Cracking (PWSCC)."

In its RAI, the NRC staff asked the licensee to address whether the generic issue (complex exams resulting in lack of coverage) was entered into the corrective action program and to identify the corrective actions taken. The licensee responded that it generated a Condition Report in its corrective action program. CR-2009-0007117, which addressed the examination

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1 Ammirato, F.V., X. Edelmann, and S.M. Walker, *Examination of Dissimilar Metal Welds in BWR Nozzle-to-Safe End Joints*, 8th International Conference on NDE in the Nuclear Industry, ASM International, 1987.

2 Lemaitre, P., T.D. Koble, and S.R. Doctor, *PISC III Capability Study on Wrought-to-Wrought Austenitic Steel Welds: Evaluation at the Level of Procedures and Techniques*, Effectiveness of Nondestructive Examination Systems and Performance Demonstration, PVP-Volume 317, NDE-Volume 14, ASME, 1995.

issues associated with all four steam generator primary nozzle ISI weld exams (on NSE-3R and NSE-4R dissimilar metal welds, and PL-FW-III-R and PL-FW-X-R similar metal welds), was categorized as a significance level 2 condition requiring an Apparent Cause Evaluation (ACE). The ACE contained the following corrective and preventive actions:

- Provide complex weld ISI inspection schedule (5th ISI Interval) to the site Level III NDE specialist;
- Quantify the similar metal weld inspections to optimal code coverage;
- Develop a template for planning for complex welds;
- Submit relief request to the NRC.

Lastly, in terms of the ASME Code-required surface examination for these welds, the licensee stated that Ginna invoked ASME Code Case N-663, "Alternative Requirements for Classes 1 and 2 Surface Examinations, Section XI, Division 1," which allows surface examination to be limited to areas identified by the Owner as susceptible to outside surface attack. These welds were evaluated by the licensee and determined that ASME Code Case N-663 was applicable and a surface examination was not required.

ASME Code Case N-663 was determined to be acceptable for use without conditions in Regulatory Guide 1.147, "Inservice Inspection Code Case Acceptability, ASME Section XI, Division 1." This safety evaluation does not evaluate the use of this ASME Code Case.

The licensee has shown that it is impractical to meet the ASME Code-required 100 percent volumetric examination coverage for the subject welds due to their design and ultrasonic access restrictions. Based on the information provided by the licensee, and considering that the limited examination scanning covered the wetted ID surface of the dissimilar metal interface and resulted in no recordable indications, and that these DM welds are constructed with Alloy 52/152 filler metal that is resistant to PWSCC, the NRC staff determined that the inspections achieved adequate coverage to conclude that if significant service-induced degradation were occurring, evidence of it would have been detected by the examinations that were performed.

ASME Code Category B-J, Pressure Retaining Welds in Piping, Item No. B9.11 Circumferential Pipe Welds PL-FW-III-R and PL-FW-X-R

The licensee stated that the steam generator inlet and outlet elbow-to-safe-end welds (PL-FW-III-R and PL-FW-X-R) are accessible only from the safe-end/nozzle side based on the designed configuration. The close proximity of the safe-end and the cast material prohibits the ultrasonic wave entering the ASME Code required examination volume at an angle that will interrogate the weld volume for in-service flaws. There is no Appendix VIII qualified NDE technique for examination through cast stainless steel. These examinations were performed as a "best effort" attempt for flaw detection.

The licensee stated that the "B' steam generator elbow-to-safe-end (Inlet) and safe-end-to-elbow (Outlet) are considered similar metal welds, consisting of a cast stainless steel elbow to a stainless steel safe-end. The welds have an outside diameter of 36 inches and a nominal wall thickness of 3.74 inches. The licensee stated that when the weld joint was fitted and welded in place, there were some fit-up and internal offset issues. The licensee continued that the joint

internal offset, 15-degree taper on the outside surface, and final weld preparation all contributed to a complex weld geometry configuration. From the UT information that was gathered, the licensee determined that there was no design margin to remove additional material on the outside surface in order to remove the weld hump to improve scanning/coverage.

The licensee stated that during the ultrasonic examination of this weld, less than 90 percent coverage of the required examination volume was obtained. In order to scan all of the required volume for this weld, the steam generator elbow-to-safe-end welds would have to be redesigned to allow scanning from both sides of the weld, which is impractical. As shown on the sketches and technical descriptions included in the licensee's submittal, examinations of the subject piping welds have been completed to the extent practical resulting in 0 percent (10 percent best effort coverage) for both Welds PL-FW-III-R and PL-FW-X-R of the ASME Code-required examination volume.

As stated in the licensee's RAI response dated July 29, 2011, "a pre-outage technical error and lack of reviews missed the fact that the narrow groove tie-in weld adjacent to the DM weld was also needed for performance demonstration. Once the ISI examination started, it was discovered that the SS safe-end had the following factors: wall thickness greater than what was qualified in PDI-UT-2 procedure; on a taper surface; and scanning through adjacent DM weld. These facts mean that the licensee cannot claim any code coverage; therefore no code coverage 0 percent was credited."

The percentage of coverage reported for each weld represents the aggregate coverage from all scans performed on the weld and adjacent base material. The examination coverage was based on the aggregate from manual scans of 45-degree shear wave on top of the safe-end and 60-degree refracted longitudinal wave scans through the adjacent DM weld. The licensee stated that no recordable indications were found during the inspections of these welds.

In their first RAI, the NRC staff acknowledged that this is a difficult examination, however the NRC staff believes that it would be possible to obtain greater coverage through various options including the use of PAUT employing site-specific mockups, if necessary, and/or overlaying the welds. Therefore, the NRC staff asked the licensee to address (a) whether or not it could have obtained greater coverage using PAUT, (b) if it could have obtained greater coverage with PAUT, why that was not employed in the fourth ISI interval, and (c) what it will do for future examinations to maximize ASME Code coverage. The licensee responded that PAUT would not provide additional coverage due to tapered surface and limited scanning through an adjacent DM weld, but would be beneficial for flaw depth sizing if flaws were detected.

In its second RAI, the NRC staff noted that zero percent code coverage was obtained as a result of the licensee's error/lack of review. The NRC staff asked the licensee to clarify why this exam was not completed at the next outage. In its RAI response dated March 16, 2012, the licensee stated that the exam will not be done in the Fifth 10-year Interval. Further, it stated "Zero percent code coverage was due to limitations that were not recognized prior to the exam. If recognized, it would have been apparent that this exam was impractical and only a limited best effort exam was possible." The licensee believes that due to the stated limitations, sufficient technology is not currently available to provide ASME Code coverage. The licensee continued, "these welds were part of the 1996 Steam Generator replacement project and no flaws were identified in the pre-service RT examinations. With the three follow-up examinations

discussed in other portions of this response, Ginna will meet the ASME Code required minimum number (129) of properly performed weld examinations for this sample population of 517 welds. A total of 131 Examination Category B-J welds were originally selected for the fourth Interval ISI program and with the exception of these two welds, 129 will be complete. While this sample does not address these two terminal ends, improved trending information can be obtained from other terminal ends. Although part of the high safety significance weld population, these welds were not chosen for future exams in the Risk Informed program."

In its RAI, the NRC staff asked the licensee to address whether the generic issue (complex examinations resulting in lack of coverage) was entered into the corrective action program and to identify the corrective actions taken. The licensee responded that the licensee generated a Condition Report in its corrective action program. As was noted in the section above (for ASME Code Category B-F, Item No. B5.70), CR-2009-0007117 was categorized as a significance level 2 condition requiring an ACE. The ACE contained the following corrective and preventive actions:

- Provide complex weld ISI inspection schedule (5th ISI Interval) to the site Level III NDE specialist;
- Quantify the similar metal weld inspections to optimal code coverage;
- Develop a template for planning for complex welds;
- Submit a relief request to the NRC.

Lastly, in terms of the ASME Code-required surface exams, the licensee stated that Ginna invoked ASME Code Case N-663, which allows surface examination to be limited to areas identified by the Owner as susceptible to outside surface attack. These welds were evaluated by the licensee and determined that ASME Code Case N-663 was applicable and a surface examination was not required.

The licensee has shown that it is impractical to meet the ASME Code-required 100 percent volumetric examination coverage for the subject welds due to their design and ultrasonic access restrictions. Based on the information provided by the licensee, the NRC Staff has determined that the ultrasonic examination of these welds is impractical. The NRC staff further considered the following: (a) once the three follow-up examinations for ASME Code Category B-J, Item B9.11 are performed (discussed in the next section of this SE), the licensee will meet the risk informed ISI-required minimum (129) of properly performed weld examinations for the sample population of 517 welds, and (b) in the future, these welds will not be required to be examined under the site's Risk Informed ISI Program. Therefore, the NRC Staff accepts 0 percent Code-coverage with 10 percent best effort coverage for fourth ISI interval.

ASME Code Category B-J, Pressure Retaining Welds in Piping, Item No. B9.11 Circumferential Pipe Welds PL-FW-XIII, PL-FW-VI, PL-FW-XV, PL-FW-VIII, D, A, B, CSW-5, A, C,H, H and J

Weld PL-FW-XIII

The licensee stated that in accordance with the site's fourth Interval ISI Program, Weld PL-FW-XIII, an Elbow-to-Pump (RCP-A) weld on a 31" Reactor Coolant Loop A line, was ultrasonically UT examined in 2008 under ISI Summary Number 1012000. During preparation of their RAI responses, the licensee discovered that the ISI examination on this weld was performed incorrectly. The licensee initiated Condition Report CR-2012-000188 to document the deficiency of the incorrect procedure being used and, thus, no code coverage was credited. The licensee commits to perform ultrasonic examinations no later than the end of the 2014 refueling outage (RFO).

Weld PL-FW-VI

The licensee stated that Weld PL-FW-VI was examined by manual ultrasonics using 45 degree shear waves for the axial scans on the pipe-side, 60 degree refracted longitudinal waves for a best effort exam on the far side of the weld (scanned from the pipe side), and 45 degree shear waves in both the clockwise and counter-clockwise directions for circumferential scans. The component scan limitation was due to the pump cast stainless steel material and configuration restrictions. No axial scans were performed on the pump-side of the weld. Though best effort exams were performed on the far side of the weld, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld PL-FW-XV

The ASME Code requirement for the exam of Weld PL-FW-XV, a cast stainless-steel elbow to a cast stainless-steel pump casing weld configuration, is to use an alternate "state of the art" technique using ASME Section XI, Appendix III procedure that addresses inherent course-grained structures in accordance with IWA-2240. Therefore, the licensee examined the weld using a best effort manual ultrasonics exam with a SCIC20 transducer and Appendix III procedure. The resulting exam provided 40.5 percent coverage of the ASME Code-required examination volume. The component scan limitation was due to the pump configuration restrictions; therefore, no axial scan was performed on the pump-side (far side) of the weld. All axial weld exams were performed on the elbow-side (near side) of the weld. The insonification angles used for the exam were 30-degree refracted longitudinal waves for the axial scan on the elbow side to detect weld discontinuities. The 30-degree refracted longitudinal (RL) waves were also used on the far-side of the weld, scanned from the elbow-side, for a best effort exam. Lastly, circumferential scans were performed using 30-degree RL waves in both the clockwise and counter-clockwise directions.

PL-FW-VIII

The licensee stated that Weld PL-FW-VIII, a cast stainless steel pump to a wrought stainless steel pipe weld configuration, was examined by manual ultrasonics with both 45-degree shear waves and 60-degree refracted longitudinal waves. The 45-degree shear waves for the axial scans were conducted on the pipe-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for best effort axial scans on the far side of the weld. Lastly, the circumferential scans were performed using 45-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld D

The licensee stated that Weld D, a stainless steel pipe to stainless steel nozzle weld configuration, was examined by manual ultrasonics with both 60-degree shear waves and 60-degree refracted longitudinal waves. The 60-degree shear waves for the axial scans were conducted on the pipe-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for best effort axial scans on the far side of the weld. The circumferential scans were performed using 60-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld resulting in total examination coverage of 74 percent, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld A (Summary No. I028900)

The licensee stated that Weld A, a stainless steel valve to stainless steel pipe weld configuration, was examined by manual ultrasonics with both 45-degree shear waves and 60-degree refracted longitudinal waves. The 45-degree shear waves for the axial scans were conducted on the pipe-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for best effort axial scans on the far side of the weld. Lastly, the circumferential scans were performed using 45-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld B

The licensee stated that Weld B, a stainless steel pipe to valve weld configuration, was examined by manual ultrasonics with both 45-degree shear waves and 60-degree refracted longitudinal waves. The 45-degree shear waves for the axial scans were conducted on the pipe-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for

best effort axial scans on the far side of the weld. Lastly, the circumferential scans were performed using 45-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld, only 49.5 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds. A welded identification tag obstructed some of the axial exams, thus reducing the ASME Code coverage.

Weld CSW-5

The licensee stated that Weld CSW-5, a stainless steel tee to nozzle weld configuration, was examined by manual ultrasonics with both 45-degree shear waves and 60-degree refracted longitudinal waves. The 45-degree shear waves for the axial scans were conducted on the tee-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for best effort axial scans on the far side of the weld. Lastly, the circumferential scans were performed using 45-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld A (Summary No. I030400)

The licensee stated that Weld A, a stainless steel nozzle to pipe weld configuration, was examined by manual ultrasonics with 45- and 60-degree shear waves and 60-degree RL waves. The 45- and 60-degree shear waves were used for the axial scans on the pipe-side to detect weld discontinuities. The 60-degree RL was used for the best effort scan on the far side of the weld. The circumferential scans were performed using 45-degree shear waves in the clockwise and counterclockwise directions. Though best effort exams were performed on the far side of the weld resulting in total examination coverage of 74 percent, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld C

The licensee stated that Weld C, a stainless steel valve to pipe weld configuration, was examined by manual ultrasonics with both 45-degree shear waves and 60-degree refracted longitudinal waves. The 45-degree shear waves for the axial scans were conducted on the pipe-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for best effort axial scans on the far side of the weld. Lastly, the circumferential scans were performed using 45-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld, only 49.5 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of

the austenitic welds. A welded idenification tag in the scan area obstructed some of the exams, thus reducing the ASME Code coverage.

Weld H (Summary No. I034300)

The licensee stated that Weld H, a stainless steel pipe to valve weld configuration, was examined by manual ultrasonics with both 45-degree shear waves and 60-degree refracted longitudinal waves. The 45-degree shear waves for the axial scans were conducted on the pipe-side (near side) to detect weld discontinuities. The 60-degree RL waves were used for best effort axial scans on the far side of the weld. Lastly, the circumferential scans were performed using 45-degree shear waves in both the clockwise and counter-clockwise directions. Though best effort exams were performed on the far side of the weld, only 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

Weld H (Summary No. I035900)

The licensee stated that Weld H, a stainless steel pipe to valve configuration, was examined by manual ultrasonics with 60-degree shear waves for the axial scan on the pipe-side (near side) to detect weld discontinuities, and for the circumferential scans in both the clockwise and counter-clockwise directions. Though required by the PDI qualified UT procedure used, no best effort exam was performed on the far side of the weld. The 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

In its response to the NRC's RAI, the licensee stated that Condition Report CR-2012-000188 was generated to document the examination deviation from the approved procedure. The examiner did not use the required longitudinal search unit for the "best effort" examination scan on the far side of the weld to detect discontinuities, and the data reviewer did not catch the missed scan during the examination document review process in 2002.

In its RAI, the NRC staff asked the licensee to address what plans are in place to meet the required PDI procedure. The licensee stated, "Ginna commits to perform this 4th interval ultrasonic ISI examination no later than the end of the 2014 RFO." Additionally, in response to the NRC staff's question regarding whether the generic issue was entered into the corrective action program, the licensee stated that it was entered into the site's corrective action program (CR-2012-000188) with the following corrective actions:

1. Scope additions for the weld examinations.
2. Independent check of the initial ISI scope UT implementation list for upcoming refueling outage.
3. Enhance existing UT weld examination scan plans for future scheduled ISI welds.

4. Revise existing UT reviewer checklist to enhance the final examination record reviews.

Lastly, the licensee further stated that in accordance with the applicable ASME Code, a surface and volumetric examination was performed during the 2002 Refueling Outage. The surface examination, a liquid penetrant test (PT), was acceptable with no recordable indications and no limitations.

Weld J

The licensee stated that Weld J, a stainless steel valve to pipe configuration, was examined by manual ultrasonics with 45- and 60-degree shear waves. The 45-degree shear waves were used for the axial scan on the pipe-side (near side) to detect weld discontinuities, and for the circumferential scans in both the clockwise and counter-clockwise directions. The 60-degree shear waves were used for the best effort scan on the far side of the weld; however no best effort RL scan was performed on the far side, as required by PDI. The 50 percent ASME Code-required exam coverage may be claimed as approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of the austenitic welds.

In their response to the NRC's RAI, the licensee stated that Condition Report CR-2012-000188 was generated to document the examination deviation from the approved procedure. The examiner did not use the required longitudinal search unit for the "best effort" examination scan on the far side of the weld to detect discontinuities, and the data reviewer did not catch the missed scan during the examination document review process in 2002.

In its RAI, the NRC staff asked the licensee to address what plans are in place to meet the required PDI procedure. The licensee stated, "Ginna commits to perform this 4th interval ultrasonic ISI examination no later than the end of the 2014 RFO." Additionally, in response to the NRC staff's question regarding whether the generic issue was entered into the corrective action program, the licensee stated that, yes, it was entered into the site's corrective action program (CR-2012-000188) with the following corrective actions:

1. Scope additions for the weld examinations.
2. Independent check of the initial ISI scope for upcoming refueling outage.
3. Enhance existing UT weld examination scan plans for future scheduled ISI welds.
4. Revise existing reviewer checklist for enhancing the final examination record reviews.

The licensee further stated that in accordance with the applicable ASME Code, a surface and volumetric examination was performed during the 2002 Refueling Outage. The PT surface examination was acceptable with no recordable indications and no limitations.

In summary, for welds in ASME Code Category B-J, Item No. B9.11, as shown on the sketches and technical descriptions included in the licensee's submittal, examinations of the subject piping welds have been completed to the extent practical resulting in coverage of 40.5 percent to 50 percent of the ASME Code-required examination volume (see table above). The percentage achieved represents the aggregate coverage from all scans performed on the weld and adjacent base material, and were achieved using manual scans of shear wave and refracted longitudinal wave scans perpendicular and parallel to the weld. For Welds H and J where the best effort refracted longitudinal wave scans were omitted, and for Weld PL-FW-XIII where the incorrect procedure was applied, the licensee has committed to performing the required examination no later than the end of the 2014 RFO

With the exceptions noted above, the licensee stated that the NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. It states in 10 CFR 50.55a(b)(2)(xv)(A)(2), in part, "Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld." The approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of austenitic welds. There were no recordable indications found during the inspection of these welds.

ASME Code Case N-663 allows surface examinations to be limited to areas identified by the Owner as susceptible to outside surface attack. The licensee stated that ASME Code Case N-663 was invoked for the third period of the fourth ISI interval for welds PL-FW-XIII, PL-FW-VIII, D, A, B, CSW-5, A, C and H (Summary No. 1034300); therefore, no surface examination was performed on these welds. Welds PL-FW-VI, PL-FW-XV, H (Summary No. 1035900), and J did have a surface examination performed during the fourth interval in accordance with the ASME Code. In its response to the NRC staff's RAI, the licensee stated that for the four welds required to have surface examination performed, no recordable indications were found by PT.

The licensee has shown that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject welds due to the design configuration of the welds. Based on the examination performed, and in consideration of the licensee's commitments to re-examine welds H, J, and PL-FW-XIII to meet PDI requirements, the NRC staff concludes that if significant service-induced degradation were occurring in the subject welds, there is reasonable assurance that evidence of it would have been detected. Therefore, the NRC staff further concludes that there is reasonable assurance of structural integrity of the subject welds based on the examination that have been performed.

ASME Code Category B-J, Pressure Retaining Welds in Piping, Item No. B9.31 Branch Weld, PL-FW-II

The licensee stated that the ultrasonic examination of the above branch weld was limited in coverage due to component configuration. It was not possible to perform the ultrasonic examination from both sides of the weld since one side of the weld was not suitable for

scanning based on the scanning surface angle of the component; therefore, the weld only received a single sided examination resulting in less than 90 percent coverage of the required examination volume.

As shown on the sketch and technical description included in the licensee's submittal, examination of the subject stainless steel pipe to branch weld configuration has been completed to the extent practical resulting in coverage of 50 percent of the ASME Code-required examination volume (see table above). The percentage achieved represents the aggregate coverage from all scans performed on the weld and adjacent base material, and were achieved using 45- and 60-degree shear wave and 60-degree refracted longitudinal wave scans. The 45--and 60-degree shear waves were used for the axial scans on the pipe-side (near side) to detect weld discontinuities, and for the circumferential scans in both the clockwise and counter-clockwise directions. The 60-degree RL waves were used for the best effort scan on the far side of the weld.

The licensee stated that the NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. Section 10 CFR 50.55a(b)(2)(xv)(A)(2) states in part, "Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld." The approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of austenitic welds.

Weld PL-FW-II did have a PT surface examination performed during the fourth interval in accordance with the ASME Code. There were no recordable indications found during the UT and PT inspections of these welds.

The licensee has shown that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject weld due to the design configuration of the weld. Based on the examination performed, the NRC staff concludes that if significant service-induced degradation were occurring in the subject welds, there is reasonable assurance that evidence of it would have been detected by the examinations performed. Therefore, the NRC staff further concludes that there is reasonable assurance of structural integrity of the subject weld based on the examinations that have been performed.

SME Code Category B-M-1, Pressure Retaining Welds in Valve Bodies, Item No. B12.40 Valve Body Welds, V-720-1 and V-720-2

The licensee stated that the ultrasonic examination of the above stainless steel valve to valve body welds was limited in coverage due to component configuration. The valves have an extension circumferentially welded to one end of the valve. The licensee stated that it was not possible to perform the ultrasonic examination from both sides of the weld since the valve side of the weld was not suitable for scanning based on the scanning surface angle of the component. Therefore, the weld only received a single sided examination resulting in less than 90 percent coverage of the required examination volume.

As shown on the sketch and technical description included in the licensee's submittal, examination of the subject piping weld has been completed to the extent practical resulting in coverage of 50 percent of the ASME Code-required examination volume (see table above). The percentage achieved represents the aggregate coverage from all scans performed on the weld and adjacent base material, and were achieved using 45-degree shear wave for the axial scan on the pipe-side (near side) to detect weld discontinuities, and 60-degree refracted longitudinal waves for the best effort axial scan of the far side of the weld. Additionally, circumferential scans were performed using 45-degree shear waves in both clockwise and counter-clockwise directions.

The licensee stated that the NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. 50.55a(b)(2)(xv)(A)(2) states in part, "Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld." The approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of austenitic welds.

The licensee stated that ASME Code Item Number B12.40 only requires a volumetric examination to be performed. The licensee stated that there were no recordable indications found during the inspection of these welds.

The licensee has shown that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject weld due to the design configuration of the weld. Based on the examination performed, the NRC staff concludes that if significant service-induced degradation were occurring in the subject welds, there is reasonable assurance that evidence of it would have been detected. Therefore, the NRC staff further concludes that there is reasonable assurance of structural integrity of the subject weld based on the examinations that have been performed.

3.2 Relief Request ISI-03

3.2.1 Applicable Code Edition and Addenda

The code of record for the fourth 10-year ISI program at Ginna, which began on January 1, 2000 and ended on December 31, 2009, was the 1995 Edition/1996 Addenda of the ASME Code, Section XI. Additionally, the 1995 Edition/1996 Addenda was used for the ASME Code, Section XI, Appendix VIII. The licensee noted in ISI-03 that the ASME Code, Appendix VIII was implemented in accordance with the schedule specified in 10 CFR 50.55a which occurred in during the Ginna Station fourth ISI Inspection interval. All the welds addressed in ISI-03 were examined after the applicable supplement became effective.

3.2.2 Applicable Code Requirement

ASME Section XI, Sub-Article IWC-2500 states in part, "Components shall be examined and tested as specified in Table IWC-2500-1." Table IWC-2500-1 requires an examination of applicable Class 2 pressure retaining welds, which includes essentially 100 percent of weld length, once during the ten year interval for the following ASME Code Categories:

C-F-1, Item Number C5.21
C-F-2, Item Number C5.51

ASME Code Case N-460, *Alternative Examination Coverage for Class 1 and Class 2 Welds*, as an alternative approved for use by the NRC in Regulatory Guide (RG) 1.147, Revision 16, *Inservice Inspection Code Case Acceptability* (RG 1.147), states that a reduction in examination coverage due to part geometry or interference for any Class 1 and 2 weld is acceptable provided that the reduction is less than 10 percent, i.e., greater than 90 percent examination coverage is obtained. Ginna has adopted ASME Code Case N-460 in their ISI Program Plan.

3.2.3 Components for Which Relief is Requested

ASME Code Class:	Class 2
Examination Category:	C-F-1, C-F-2
Item Number:	C5.21, C5.51

Cat	Item Number	Summary No.	Comp ID	Dia (in)	Thk (in)	Matl	Coverage	Description
C-F-1	C5.21	I162770	18	3.8	0.30	SS	82.5%	Pipe to Tee
C-F-1	C5.21	I163070	6	3	0.30	SS	50%	Pipe to Valve
C-F-1	C5.21	I163220	14	3	0.31	SS	50%	Valve to Pipe
C-F-1	C5.21	I163230	15	3	0.31	SS	50%	Pipe to Valve
C-F-1	C5.21	I163570	8	3	0.30	SS	50%	Valve to Pipe
C-F-1	C5.21	I164300	56	4	0.337	SS	50%	Pipe to Valve
C-F-2	C5.51	I083900	G2-BC-2-A	6	0.432	CS	84.7	Pipe to Valve
C-F-2	C5.51	I090400	L2-BC-2-A	6	0.432	CS	86	Pipe to Valve

3.2.4 Licensee Basis for Relief (as stated)

In order to scan all of the required volume for this weld, the components would have to be redesigned to allow scanning from both sides of the weld, which is impractical. There were no recordable indications (other than geometric indications) found during the inspection of these welds. Based on the components designed configuration, the available coverage will not meet the requirements of the ASME Code or Code Case N-460.

In accordance with 10 CFR 50.55a(g)(5)(iii), relief is requested for the components listed in [the table above] on the basis that the required examination coverage of "essentially 100 percent" is impractical due to physical obstructions and the limitations imposed by design, geometry, and materials of construction. Ginna LLC utilized examination techniques qualified to meet the requirements of ASME Section XI, Appendix VIII, as required in 10 CFR 50.55a(g)(6)(ii)(c), that achieved the maximum practical amount of coverage obtainable within the limitations imposed by the design of the components and examination techniques. Additionally, VT-2 examinations are performed on the subject welds each period of the fourth interval during [ASME] code required system pressure tests. These examinations were completed each period and no evidence of leakage was identified.

Based on the design configuration of the components and available examinations techniques, Ginna LLC was not able to achieve greater than 90% [ASME] Code coverage of the required examination volume for the components listed above without major modifications to the components.

3.2.5 Licensee's Proposed Alternative Examination

The licensee stated that no alternative examinations were performed for the welds during the fourth inspection interval. The use of RT as an alternate volumetric examination for all the above listed components is not practical due to geometric configuration and to the limited ability

of RT to detect inservice flaws. Other restrictions making radiography impractical are the physical barriers prohibiting access for placement of source, film, image quality indicator, etc.

The licensee stated that IWC-2500, Table IWC-2500-1, Examination Category C-H System Leakage Tests and VT-2 visual examinations performed each inspection period provide adequate assurance of pressure boundary integrity. In addition to the above ASME Code required examinations (volumetric and pressure test), there are other activities which provide a high level of confidence that, in the unlikely event that leakage did occur through this weld it would be detected and proper action taken. The component welds were inspected by volumetric and surface NDE methods during construction and verified to be free from unacceptable fabrication defects.

3.2.6 Duration of Proposed Alternative

The proposed alternative is requested for the fourth 10-year ISI interval for Ginna which began on January 1, 2000 and ended on December 31, 2009.

3.2.7 Staff Evaluation

The ASME Code requires an examination of applicable Class 2 pressure retaining welds, which includes essentially 100 percent of weld length once during the ten year interval for the ASME Code Categories C-F-1 (Item Number C5.21) and C-F-2 (Item Number C5.51). However, for the subject welds at Ginna, complete examinations are restricted for various reasons. The details for the welds in each ASME Code Categories are discussed below.

ASME Code Category C-F-1, Pressure Retaining Welds in Austenitic Stainless Steel or High Alloy Piping, Item No. C5.21 Circumferential Pipe Welds 18, 6, 14, 15, 8, and 56

The licensee stated that the ultrasonic examination of the above pipe welds was limited in coverage due to component configuration. It was not possible to perform the ultrasonic examination from both sides of the weld since one side of the weld was not suitable for scanning based on the scanning surface angle of the component. Therefore, the welds only received a single sided examination or partial single sided examination resulting in less than 90 percent coverage of the required examination volume. There were no recordable indications found during the inspection of these welds.

The licensee stated that the NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. It states in 10 CFR 50.55a(b)(2)(xv)(A)(2), in part, "Where examination from both sides is not possible on austenitic welds or dissimilar metal welds, full coverage credit from a single side may be claimed only after completing a successful single-sided Appendix VIII demonstration using flaws on the opposite side of the weld." The approved examination techniques have not been qualified in accordance with Appendix VIII to detect and size flaws on the opposite side of austenitic welds.

Weld 18

Manual UT examination was performed from both sides of Weld 18, a stainless steel pipe to stainless steel tee weld configuration. The 70-degree shear waves were used for the axial scans in the upstream and downstream directions for both pipe and tee side sides of the weld. The 60-degree shear waves were used for the circumferential scans in both the clockwise and counter-clockwise directions. The component had a scanning limitation due to losing transducer contact when scanning on and within the tee's crotch radius regions (two regions) adjacent to the weld. The resulting ASME Code-required examination coverage was 82.5 percent.

Weld 6

Manual UT examination was performed on Weld 6, a stainless steel pipe to valve weld configuration. The 0-degree scans were performed for weld profiling, 45-degree shear waves were used for the axial scans on the pipe-side (near-side) to detect weld discontinuities, 70-degree shear waves were used for the best effort examination of the far-side of the weld, and 45-degree shear waves were used for the circumferential scans in both the clockwise and counter-clockwise directions. The component scan limitation was due to the valve configuration restrictions; therefore, no axial or circumferential scans were performed on the valve-side of the weld. The resulting ASME Code-required examination coverage was 50 percent and, though no credit may be taken, the best effort exam increased coverage to 70 percent.

Weld 14

Manual UT examination was performed on Weld 14, a stainless steel valve to pipe weld configuration. The 0-degree scans were performed for weld profiling, 52-degree shear waves were used for the axial scans on the pipe-side (near-side) to detect weld discontinuities, 70-degree shear waves were used for the best effort examination of the far-side of the weld, and 45-degree longitudinal waves and 52-degree shear were used for the circumferential scans in both the clockwise and counter-clockwise directions. (Note: the licensee's RAI response stated that vendor procedure #ISwT-PDI-UT1 was used to examine this weld. Within this procedure, the 52-degree shear wave transducer is qualified.) The component scan limitation was due to the valve configuration restrictions; therefore, no axial scan was performed on the valve-side of the weld. The resulting ASME Code-required examination coverage was 50 percent and, though no credit may be taken, the best effort exam increased coverage to 70 percent.

Weld 15

Manual UT examination was performed on Weld 15, a stainless steel valve to pipe weld configuration. The 0-degree scans were performed for weld profiling, 52-degree shear waves were used for the axial scans on the pipe-side (near-side) to detect weld discontinuities, 70-degree shear waves were used for the best effort examination of the far-side of the weld, and 45-degree longitudinal waves and 52-degree shear were used for the circumferential scans in both the clockwise and counter-clockwise directions. (Note: Per the licensee's RAI response,

vendor procedure #ISwT-PDI-UT1 was used to examine this weld. Within this procedure, the 52-degree shear wave transducer is qualified.) The component scan limitation was due to the valve configuration restrictions; therefore, no axial scan was performed on the valve-side of the weld. The resulting ASME Code-required examination coverage was 50 percent and, though no credit may be taken, the best effort exam increased coverage to 70 percent.

Weld 8

Manual UT examination was performed on Weld 8, a stainless steel pipe to valve weld configuration. The 0-degree scans were performed for weld profiling, 45- and 60-degree shear waves were used for the axial scans on the pipe-side (near-side) to detect weld discontinuities, 70-degree shear waves were used for the best effort examination of the far-side of the weld, and 45-degree shear waves were used for the circumferential scans in both the clockwise and counter-clockwise directions. The component scan limitation was due to the valve configuration restrictions; therefore, no axial or circumferential scans were performed on the valve-side of the weld. The resulting ASME Code-required examination coverage was 50 percent and, though no credit may be taken, the best effort exam increased coverage to 70 percent.

Weld 56

Manual UT examination was performed on Weld 56, a stainless steel flange to pipe weld configuration. The 0-degree scans were performed for weld profiling, 52-degree shear waves were used for the axial scans on the pipe-side (near-side) to detect weld discontinuities, 70-degree shear waves were used for the best effort examination of the far-side of the weld, and 45-degree longitudinal waves and 52-degree shear were used for the circumferential scans in both the clockwise and counter-clockwise directions. (Note: Per the licensee's RAI response, vendor procedure #ISwT-PDI-UT1 was used to examine this weld. Within this procedure, the 52-degree shear wave transducer is qualified.) The component scan limitation was due to the valve configuration restrictions; therefore, no axial scan was performed on the valve-side of the weld. The resulting ASME Code-required examination coverage was 50 percent; no coverage credit was claimed for best effort exams.

ASME Code Case N-663 allows surface examinations to be limited to areas identified by the Owner as susceptible to outside surface attack. The licensee stated that ASME Code Case N-663 was invoked for the third period of the fourth ISI interval for welds 18 and 6; therefore, no surface examination was performed on these welds. Welds 14, 15, 8 and 56 did have a surface examination performed during the fourth interval in accordance with the ASME Code. These four welds had no recordable indications found as a result of either of the examinations. The licensee has shown that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject welds due to the design configuration of the welds. Based on the examination performed, the NRC staff concludes that if significant service-induced degradation were occurring in the subject welds, there is reasonable assurance that evidence of it would have been detected. Therefore, the NRC staff further concludes that there is reasonable assurance of structural integrity of the subject welds based on the examination that have been performed.

ASME Code Category C-F-2, Pressure Retaining Welds in Carbon or Low Alloy Piping, Item No. C5.51 Circumferential Pipe Welds G2-BC-2-A and L2-BC-2-A

The licensee stated that the ultrasonic examination of the above pipe welds was limited in coverage due to component configuration and/or immovable physical barriers. In order to scan all of the required volume of these welds, the component would have to be redesigned, which is impractical.

The licensee stated that the NDE techniques and procedures used incorporate examination techniques qualified under Appendix VIII of the ASME Section XI Code by the PDI for examination of the pipe welds. No recordable indications were found during the inspection of these welds.

Weld G2-BC-2-A

Manual UT examination was performed on Weld G2-BC-2-A, a carbon steel pipe to carbon steel valve weld configuration. The 0-degree scans were performed for the base metal lamination and thickness examination, 45-degree shear waves were used for the axial scans to detect weld discontinuities, 70-degree shear waves were used for examinations of the far side of the weld, and 45-degree shear waves were used for the circumferential scans in both the clockwise and counter-clockwise directions. The component scan limitation was due to valve configuration restrictions; therefore, no axial scan was performed on the valve-side of the weld. Additionally, within the scan region, there was a ¾" weld-o-let that interfered with the scanning. The resulting ASME Code-required examination coverage was 84.7 percent.

Weld L2-BC-2-A

Manual UT examination was performed on Weld L2-BC-2-A, a carbon steel pipe to carbon steel valve weld configuration. The 0-degree scans were performed for the base metal lamination and thickness examination, 45-degree shear waves were used for the axial scans to detect weld discontinuities, 60-degree shear waves were used for pipe-side examinations, and 45-degree shear waves were used for the circumferential scans in both the clockwise and counter-clockwise directions. The component scan limitation was due to a 3" sweep-o-let component adjacent to the weld region. The resulting ASME Code-required examination coverage was 86 percent.

ASME Code Case N-663 allows surface examinations to be limited to areas identified by the Owner as susceptible to outside surface attack. The licensee stated that ASME Code Case N-663 was invoked for the third period of the fourth ISI interval for weld G2-BC-2-A; therefore, no surface examination was performed on this weld. Weld L2-BC-2-A did have a magnetic particle (MT) surface examination performed during the fourth interval in accordance with the ASME Code. There were no recordable indications found during the UT and MT (as applicable) inspection of these welds.

The licensee has shown that it is impractical to meet the ASME Code-required volumetric examination coverage for the subject welds due to the design configuration of the welds. Based on the examination performed, the NRC staff concludes that if significant service-induced degradation were occurring in the subject welds, there is reasonable assurance that evidence of it would have been detected. Therefore, the NRC staff further concludes that there is reasonable assurance of structural integrity of the subject welds based on the examination that have been performed.

4.0 CONCLUSION

The NRC staff has reviewed the licensee's submittal and concludes that the ASME Code examination coverage requirements are impractical for the subject welds listed in the relief requests ISI-02 and ISI-03. Based on the volumetric coverage obtained for welds other than Weld H, Weld J, and Weld PL-FW-XIII, the NRC staff concludes that, if significant service-induced degradation were occurring, there is reasonable assurance that evidence of it would have been detected by the examinations that were performed. In its letter dated March 16, 2012, the licensee made commitments to re-inspect Weld H, Weld J, and Weld PL-FW-XIII no later than the end of the 2014 refueling outage. Therefore, for the items in relief requests ISI-02 and ISI-03, excepting welds H, J and PL-FW XIII in the relief request ISI-02, relief is granted, pursuant to 10 CFR 50.55a(g)(6)(i), for the Fourth 10-year ISI interval at the Ginna Nuclear Power Plant.

The NRC staff has determined that granting relief for relief requests ISI-02 and ISI-03, 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 given due consideration to the burden upon the licensee that could result if the requirements were imposed on the facility.

All other ASME Code, Section XI requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

Principal Contributor: C. Nove

Date: June 22, 2012

All other American Society for Mechanical Engineers (ASME) Code, Section XI requirements for which relief was not specifically requested and approved in the subject request for relief remain applicable, including third-party review by the Authorized Nuclear Inservice Inspector.

If you have any questions, please contact Mohan Thadani, the NRC's Project Manager for Ginna at (301) 415-1476 or email mohan.thadani@nrc.gov.

Sincerely,
/RA by Douglas V. Pickett for/

George Wilson, Chief
Plant Licensing Branch I-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-244

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