Thomas G. Mogren
Manager - Engineering Services

R.E. Ginna Nuclear Power Plant, LLC
1503 Lake Road
Ontario, New York 14519-9364

585.771.5208
585.771.3392 Fax

Thomas.Mogren@cengllc.com

CENG
a joint venture of
Constellation Energy EDF

July 29, 2011

U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

ATTENTION: Document Control Desk

SUBJECT: **R.E. Ginna Nuclear Power Plant**
Docket No. 50-244

Response to Request for Additional Information Re: Fourth Interval Inservice Inspection Program Relief Requests Nos. ISI-02 and ISI-03

References:

(1) Letter from P. Swift, Ginna LLC, to NRC Document Control Desk, dated December 16, 2010, Subject: 10 CFR 50.55a Request ISI-02 and ISI-03: Relief From Impractical Examination Coverage Requirements Pursuant to 10 CFR50.55a(g)(5)(iii) for the Fourth Interval Inservice Inspection (ISI) Program. (Agencywide Documents Access and Management System (ADAMS) Accession No. ML103620105)

(2) Letter from D. V. Pickett, NRC, to J. T. Carlin, Ginna LLC, dated April 13, 2011, Subject: R.E. Ginna Nuclear Power Plant -Request For Additional Information Re: Fourth Interval Inservice Inspection Program Relief Requests Nos. ISI-02 and ISI-03 (TAC NOS. ME5248 and ME5249). (Agencywide Documents Access and Management System (ADAMS) Accession No. ML110880297)

In Reference 1, R.E. Ginna Nuclear Power Plant, LLC (Ginna LLC) requested relief from impractical examination coverage requirements pursuant to 10 CFR50.55a(g)(5)(iii) for the Fourth Interval Inservice Inspection (ISI) Program. This 10 CFR 50.55a request is for weld examinations performed during the 4th 10-Year ISI Interval, where the required coverage of 'essentially 100 percent' could not be obtained, when examined to the extent practical in accordance with ASME Section XI Code Case N-460 "Alternative Examination Coverage for Class 1 and 2 Welds". The basis for the 10 CFR 50.55a request is that compliance with the specified requirements is impractical as described in Relief Request ISI-02 and ISI-03. This request for the Fourth Interval Inservice Inspection (ISI) Program, ended December 31, 2009.

In Reference 2, the Nuclear Regulatory Commission (NRC) sent a request for additional information (RAI). The questions in the RAI and the corresponding responses are in the attached enclosure.

A047
NRR

There are no regulatory commitments contained in this letter. Should you have questions regarding this matter, please contact Thomas Harding (585) 771-5219, or Thomas.hardingjr@cengllc.com.

Very truly yours,

Thomas Mogren

Enclosure: Response to Request for Additional Information Regarding Relief Request ISI-02 and 03

cc: W. M. Dean, NRC
D. V. Pickett, NRC
Resident Inspector, NRC (Ginna LLC)

ENCLOSURE

Response to Request for Additional Information Regarding Relief Request ISI-02 and ISI-03

ENCLOSURE
Response to Request for Additional Information Regarding Relief Request ISI-02 and ISI-03

Relief Request ISI-02

Question No. 1

Please provide the edition and addenda of the ASME Code, Section XI, Appendix VIII that was used for these examinations.

Response

Cat	Item	Summary No.	Comp ID	Year Examined	ASME Section XI 1995 Edition/1996 Addenda Appendix VIII
B-F	B5.70	I007190	NSE-4R	2009	X
		I006990	NSE-3R	2009	X
B-J	B9.11	I007000	PL-FW-III-R	2009	X
		I007200	PL-FW-X-R	2009	X
		I012000	PL-FW-XIII	2008	(1)
		I012100	PL-FW-VI	2005/2006	X
		I013500	PL-FW-XV	2005	(1)
		I013600	PL-FW-VIII	2008	X
		I014500	D	2009	X
		I028900	A	2009	X
		I029400	B	2008	X
		I030300	CSW-5	2009	X
		I030400	A	2009	X
		I030700	C	2008	X
		I034300	H	2003/2006	X
		I035900	H	2002	X
		I036200	J	2002	X
B-J	B9.31	I011000	PL-FW-II	2005	X
B-M-1	B12.40	I059200	V-720-1 (Body Weld)	2009	X
		I059205	V-720-2 (Body Weld)	2009	X

(1) ISI weld configuration consists of CSS to CSS material.

ENCLOSURE
Response to Request for Additional Information Regarding Relief Request ISI-02 and ISI-03

Relief Request ISI-02

Question No. 2

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)

Question No. 2a

a. *In regards to these welds, ISI-02 states "the "B" steam generator inlet/outlet nozzle to safe-end welds are considered as dissimilar metal welds consisting of a stainless steel clad-carbon steel nozzle with Inconel Alloy 690 weld material to a stainless steel safe end." Inconel 690 is a designation for base material. Please clarify the weld material type.*

Response

a. In accordance with Ginna Station 3rd Interval ISI Program approved Relief Request Number 27, weld filler metals used were in accordance with Code Case 2142 and 2143. Currently, the weld filler metal is designated as alloy 52 (AWS A5.14, ERNiCrFe-7) and alloy 152 (AWS A5.11, ENiCrFe-7) as listed in ASME Section IX, Article 4 under F-43 filler metal.

Question No. 2b

b. *Please provide a figure and coverage calculations for Component ID NSE-4R (I007190) and coverage calculations for Component ID NSE-3R (I006990). Please ensure that figures provided for both components clearly depict all wave modalities and insonification angles used (please note that the figure and caption should match) and examination limitations encountered. Please keep in mind that the figures are transmitted as black and white, so that different styles of lines should be used to distinguish between axial and circ scans or, if necessary, provide a figure for each of the scan directions.*

Response

b. The Ginna ISI Vendor provided additional coverage calculations to support the examination record coverage final figures as provided. See Attachment # 1.

Question No. 2c

c. *It is the NRC staff's understanding that the Performance Demonstration Initiative (PDI) program requires two angles in order to claim ASME Code coverage for a Supplement 10, single side exam. Please clarify whether your Code coverage calculations were made using two angles. Did a single angle provide greater coverage? If so, how much?*

Response

c. Yes, the site examination record indicates a combined Code coverage % using multiple scan angles by the ISI Vendor coverage calculations. See Attachment # 1.

Did a single angle provide greater coverage? Yes. The single angle providing greater coverage was the 60° RL probe that was approximately 96% coverage from one-side of the weld.

Relief Request ISI-02

Question No. 2d

d. *The PDI qualification program requires that for DM welds, the weld crown condition must be ground flush or machined to allow for adequate scanning on top of the weld and butter material. Why wasn't the Inconel weld ground flush to allow for scanning on top of the weld and butter material?*

Response

d. Prior to the 2009 outage, an engineering evaluation was performed to calculate the component required minimum thickness values for this complex dissimilar metal (DM) weld configuration. An engineering change package (ECP) was generated based on the Replacement Steam Generator project installed weld configuration. The evaluation outputs determined that the "As Found" component thicknesses of the S/G nozzle and safe-end were very near the calculated T-min values. During the evaluation phase, the original manufacturer was consulted for original design basis of these complex weld configurations. The manufacturer designed and fabricated the Replacement S/G DM weld to safe-end configuration prior to being shipped to site. The replacement S/G's were fitted into place with the existing RCS elbows (Cast SS), using the DM final design configuration and existing ID/OD fit-up offsets. The site made the decision not to alter the existing elbows other than to machine the outer surface for adequate fit-up requirements. The DM weld SS safe-end component was reduced in its length (very short) to provide the required fit-up dimensions. This fit-up created the narrow groove tie-in weld from the safe-end to existing CSS elbows.

Just prior to performing the weld crown reduction (WCR) preparation of the primary nozzle DM welds, engineers preparing the ECP determined that the welds could not be ground flush per the procedural requirements of PDI-UT-10 without potentially violating the required T-min values.

Background factors:

Just prior to the outage while engineering evaluation activities were occurring, the site formulated an Issue Response Team (IRT). The IRT had an action to select an experienced vendor to perform the DM weld crown removal (WCR) process. Three vendors were selected and assessed; the best fit was a vendor with an automated sanding process. The WCR vendor mobilized to site and started the set-up process by performing a hands-on walk-down in containment for actual field conditions. As the weld configuration is extremely complex (a 15° OD taper on the primary CS nozzle to a 30° angle machined face of the DM welds with a very short safe-end interface to a machined tie-in weld of the RCS CSS elbow), it made mounting the sanding fixture difficult. Mounting could only be 1) to the tapered surface at one end or 2) encroaching on the elbow at the other end. Also, it was discovered in the field that there were some existing external obstructions adjacent to the area to the DM weld configuration that interfered with the WCR sanding equipment, preventing it from going around the entire circumference of the welds during the proposed automated sanding process.

Based on these facts, the site started a hand grinding process with a different vendor on a spare piece of the site-specific mockup. The site realized that this process had high risks involved with hand grinding (uncontrolled process) on a complex configuration and that this grinding process was very time-consuming (inconel weld material was very difficult to hand grind) based on time trials, requiring many physical man-hours including RP & NDE oversight, that would incur high accumulated dose. The actual field dose rates adjacent to the S/G primary nozzle welds was approximately 40 Mrem/Hr. Actual field trials of hand grinding resulted in time estimates at 100

man-hours x 40 Mrem/hr = 4 Rem dose, in addition to RP and NDE oversight equaling 48 man-hours x 40 Mrem/Hr = 2 REM dose, for a total of approximately 6 REM to personnel.

Based on the dose considerations together with the concerns for violating piping T-min requirements, it was decided to keep the existing weld configurations intact.

Question No. 2e

e. *The staff believes that 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. As such, please address why PAUT was not employed in the 4th interval. What will be done for future examinations to maximize ASME Code coverage?*

Response

e. The site consulted EPRI NDE Center PDA staff to gain some insight into PAUT as compared to conventional manual UT on the site's complex configuration. EPRI's opinion was PAUT would not provide any additional coverage but would be beneficial for flaw depth sizing if flaws were detected. The site compared conventional manual UT to phased array techniques during 2008 and 2009. The site elected to go with the qualified conventional UT examinations. This decision was made prior to the fabrication of a site specific mockup for the required technical justification and performance demonstration.

References:

- "EPRI - Review of Ginna Nuclear Power Plant Dissimilar Metal Weld Walk-down Information" document; IR-2009-359.
- "EPRI - Technical Justification for the Acceptance of Ultrasonic Examination Demonstration Results on Ginna Steam Generator Nozzle Dissimilar Metal Weld Configurations with PDI-UT-10, Revision C" document; IR-2009-381.

Question No. 2f

f. Please address how this weld was examined during pre-service inspection (PSI) and the Code coverage achieved.

Response

f. Pre-Service examinations on welds NSE-3R and NSE-4R were performed in 1996 in accordance with ASME Section XI Code, 1986 Edition, No Addenda. UT and PT examinations were performed and Code coverage obtained was > 90%. The Appendix VIII requirements did not exist at this time.

Question No. 3

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

Relief Request ISI-02

Question No. 3a

a. *Please provide coverage calculations for Component IDs PL-FW-III-R (I007000) PL-FW-X-R (I007200). Please ensure that figures clearly depict all wave modalities and insonification angles used (please note that the figure and caption should match) and examination limitations encountered. Please keep in mind that the figures are transmitted as black and white, so that different styles of lines should be used to distinguish between axial and circ scans or, if necessary, provide a figure for each of the scan directions.*

Response

a. During the preparation and fabrication of the required DM weld site-specific mockup, 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 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 thru the adjacent DM weld. These facts mean that the site cannot claim any code coverage; therefore no code coverage 0% was credited. A total of 10% best effort coverage (45° shear wave on top of safe-end and 60° RL thru the adjacent DM weld) was obtained as documented in Reference 1. Based on CSS material (RCS Elbow) this configuration would be a single-sided examination (50%), and scanning thru adjacent dissimilar metal weld on a tapered surface makes this examination very limited.

Question No. 3b

b. *The staff acknowledges that these are difficult examinations; however, the staff believes that 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. As such, please address why PAUT was not employed in the 4th interval. What will be done for future examinations to maximize ASME Code coverage?*

Response

b. The site consulted EPRI NDE Center PDA staff to gain some insight into PAUT as compared to conventional manual UT on the site's complex configuration. EPRI's opinion was PAUT would not provide any additional coverage due to tapered surface and limited scanning thru an adjacent DM weld but would be beneficial for flaw depth sizing if flaws were detected. The site compared conventional manual UT to phased array techniques during the 2008 and 2009 timeframe. The site elected to go with the qualified conventional UT examinations.
For the future, the site should modify the existing site-specific mockup to include the narrow groove weld configuration with flaws that will be adjacent to the DM weld as in the field. At this time, it will be possible for a qualified ISI vendor to demonstrate a qualified UT technique such as PAUT on this component for flaw detection and applicable code coverage.

Question No. 3c

c. *Please address how this weld was examined during PSI and the Code coverage achieved.*

Relief Request ISI-02

Response

c. Pre-Service examinations on welds PL-FW-III-R and PL-FW-X-R were performed in 1996 in accordance with ASME Section XI Code, 1986 Edition, No Addenda. PT PSI examinations of both welds from the inside (ID) and outside (OD) surfaces were performed and 100% coverage obtained. RT PSI examinations were performed and 100% coverage obtained.

Question No. 4

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

Question No. 4a

a. *For all the welds listed above, please ensure that coverage calculations are provided, and that figures clearly depict all wave modalities and insonification angles used (please note that the figure and caption should match).*

Response

a. In accordance with the qualified PDI procedure, it states that it is not qualified for:
Detection or length sizing of circumferentially oriented flaws when only single side access is available and the flaw is located on the far side of the weld, however guidance is provided to perform a best effort examination of the far side examination volume. The techniques identified in this procedure have been demonstrated to be representative of "best effort" technology for single side detection of far side flaws parallel to the weld. Therefore, 50% "Code coverage" has been claimed for the near side volume and 50% (or whatever additional coverage applies) "best effort coverage" for the far side portion of the examination volume."

- Weld # PL-FW-XIII – Elbow to Pump, 48% Code Coverage 45° & 60° shear-wave and 60° RL on elbow side. Far side was examined best effort with 60° RL.
- Weld # PL-FW-VI – Pump to Pipe, 50% Code Coverage 45° shear-wave and 60° RL on pipe side. Far side was examined best effort with 60° RL.
- Weld # PL-FW-XV – Elbow to Pump, 40.5% Code Coverage SLIC20 on elbow side. Far side was examined best effort with SLIC20. See Attachment 2a and 2b.
- Weld # PL-FW-VIII – Pump to Pipe, 50% Code Coverage 45° & 60° shear-wave and 60° RL on pipe side. Far side was examined best effort with 60° RL.
- Weld # D – Pipe to Nozzle, 74% Code Coverage based on 100% CW/CCW scans using 45° shear wave and US axial scan minus welded ID tag 0% + 96% + 100% + 100% / 4= 74%. Far side was examined best effort with 60° RL.
- Weld # A – Valve to Pipe, 50% Code Coverage 45° & 60° shear-wave on pipe side. Far side was examined best effort with 60° RL.
- Weld # B – Pipe to Valve, 49.5 % Code Coverage 45° & 60° shear wave on pipe side. ID tag in area of interest -0.5% far side was examined best effort with 60° RL.
- Weld # CSW-5 – Tee to Pipe, 50% Code Coverage 45° shear wave. Far side was examined best effort with 60° RL.

Relief Request ISI-02

- Weld # A –Nozzle to Pipe, 74% Code Coverage based on 100% CW/CCW scans using 45° shear wave and DS axial scan minus welded ID tag 0% + 96% + 100% + 100% / 4= 74%. Far side was examined best effort with 60° RL.
- Weld # C – Valve to Pipe, 49.5% Code Coverage 45° & 60° shear-wave on pipe side, welded id tag = 0.5%. Far side was examined best effort with 60° RL.
- Weld # H – Pipe to Valve (867A) 48.75% Code Coverage 45° & 60° shear-wave, welded id tag = 1.2%. Far side was examined best effort with 60° RL.
- Weld # H – Pipe to Valve (867B) 50% Code Coverage 60° shear-wave. No best effort scan performed on far side with RL transducer.
- Weld # J – Valve (852B) to Pipe 50% Code Coverage 45° & 60° shear-wave. No best effort scan performed on far side with RL transducer.

Question No. 4b

b. *For Component ID PL-FW-XV (I013500), the use of insonification angles of 20°L/30°L is atypical. Was the procedure qualified to the PDI? Were these angles used for both the axial and circumferential scans? Why weren't any shear wave exams performed? Lastly, the sketch of this component for the axial exams indicates that there was coverage on the pump side, even though the pump is cast. Please provide clarification.*

Response

b. This ISI weld (PL-FW-XV) configuration is a Cast Stainless Steel elbow to Cast Stainless Steel pump casing, therefore the procedure used was not qualified to PDI. The procedure used manual ultrasonic with best available technology, where grain structure contributes to considerable sound attenuation and diffusion. The ISI vendor provided a search unit (SLIC20) to the site that produced a better signal to noise response then the 45° shear wave used previously (1995). The ISI vendor demonstrated on the site's CSS calibration block that the 20°L/30°L search unit could see the ID notch at the component thickness (2.4") as compared to the shear wave. Based on these facts, the weld was examined with these transducer angles. Coverage plot and transducer focus plot information are provided in Attachment 2a and 2b.

Question No. 4c

c. *For Component ID H (I035900), please explain why a 45° shear wave exam was not performed. Also, the PDI Program requires, for single sided exams of components greater than 0.5" thick, the use of refracted longitudinal waves to provide adequate coverage on the far side. Though this is not a PDI qualified exam, it is considered best effort. Please address why a RL exam was not performed on this weld.*

Response

c. In the 2002 Refueling outage, the site qualified examiner and site level III misinterpreted the qualified generic procedure which states, "The primary angle shall be lowest angle that provides coverage of the required examination volume from each side of the weld." The examiner used a 60° shear wave for the pipe side of the weld and for the CW & CCW scans. During the review process, the site UT Level III reviewer missed that the qualified PDI UT examiner did not perform a best effort examination on the far side of the weld using a RL transducer.

Relief Request ISI-02

Question No. 4d

d. For Component J (I036200), as asked in "c" above, please address why a longitudinal wave exam was not performed on this weld per the PDI program.

Response

d. During the review process after the 2002 refueling outage, the site UT Level III reviewer missed that the qualified PDI UT examiner did not perform a best effort examination on the far side of the weld using a RL transducer.

Question No. 4e

e. On page 7 of 21, the text reads, "There were no recordable indications found during the inspection of these welds." Please clarify whether this statement refers to only the UT exams performed or does it also include the surface exams performed on welds PL-FW-VI, PL-FW-XV, H (I035900) and J?

Response

e. The four welds, PL-FW-VI, PL-FW-XV, H (I035900) and J had UT and PT examinations performed and all four welds had no recordable indications for UT and PT.

Question No. 5

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

Question No. 5a

a. Please ensure that the figure clearly depicts all wave modalities and insonification angles used.

Response

a. For weld # PL-FW-II; 45° & 60° shear wave angles were utilized on branch side of the weld configuration during examination; a 60°RL angle was used for near and far side best effort coverage. Base metal examination using a 0° was also performed.

Question No. 5b

b. Please explain how 75% coverage was achieved when it was stated in the text that this was a single-sided examination only.

Response

b. This examination coverage was mistakenly submitted as 75% coverage. The actual coverage equals 50% Code coverage based on being single-sided exam criteria. This report has been updated to reflect the actual coverage.

Relief Request ISI-02

Question No. 5c

c. *Were any recordable indications found during either the UT or surface exams of this weld?*

Response

c. Weld PL-FW-II had both UT and PT examinations performed. No recordable indications were identified.

Question No. 6

ASME 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

Question No. 6a

a. *The figures associated with the welds listed above do not adequately depict the limitation on the valve side. Please indicate the limitations.*

Response

a. This ISI component consists of a valve configuration with valve body extension welds. These two welds are in close proximity to valve body vertical walls. When placing the transducer/wedge up against this vertical interface, the probe insonification angle is just beyond the code coverage box from the opposite scan direction creating the limitations.

Relief Request ISI-03

Question No. 1

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

Question No. 1a

a. *On page 3 of 11, the text states that "the examination coverage was based on the aggregate from manual scans of shear and longitudinal wave scans perpendicular and parallel to the weld in one axial direction and two circumferential directions and 0-degree longitudinal wave." In light of fact that scans were performed in one axial and two circ directions, it would appear that up to 75% coverage would have been possible. Therefore, please clarify the coverage calculations for all of these welds.*

Response

a. In accordance with the qualified PDI procedure, it states that it is not qualified for: Detection or length sizing of circumferentially oriented flaws when only single side access is available and the flaw is located on the far side of the weld, however guidance is provided to perform a best effort examination of the far side examination volume. The techniques identified in this procedure have been demonstrated to be representative of "best effort" technology for single side detection of far side flaws parallel to the weld. Therefore, 50% "Code coverage" has been claimed for the near side volume and 50% (or whatever additional coverage applies) "best effort coverage" for the far side portion of the examination volume."

- Weld # 18 – Pipe to Tee configuration, 82.5 % Code Coverage, limitation due to Tee crotch areas, 60° shear wave was used for CW/CCW scan directions, the 70° shear wave was used for US/DS scan directions. See Attachment # 3.

- Weld # 6 – Pipe to Valve (870A) 50% Code Coverage using a 45° shear-wave on pipe side. Far side was examined best effort with 70° shear wave.

- Weld # 14 – Valve to Pipe (871B) 50% Code Coverage using a 45° & 52° shear-wave on pipe side. Far side was examined best effort with 70° shear wave.

- Weld # 15 – Pipe to Valve (870B) 50% Code Coverage using a 45° & 52° shear-wave on pipe side. Far side was examined best effort with 70° shear wave.

- Weld # 8 – Valve to Pipe (888B) 50% Code Coverage using a 45° & 60° shear-wave on pipe side. Far side was examined best effort with 70° shear wave.

- Weld # 56 – Flange to Pipe (FE-125) 50% Code Coverage using a 45° & 52° shear-wave on pipe side. Far side was examined best effort with 70° shear wave.

Relief Request ISI-03

Question No. 1b

b. Was the 0-degree scan done for all of the welds?

Response

b. The 0-degree scan was performed on the following welds:
- Weld # 18 – Pipe to Tee – No, however, it was performed in the previous exam (1997)
- Weld # 6 – Pipe to Valve (870A) –Yes
- Weld # 14 – Valve to Pipe (871B) -Yes
- Weld # 15 – Pipe to Valve (870B) -Yes
- Weld # 8 – Valve to Pipe (888B) -Yes
- Weld # 56 – Flange to Pipe (FE-125) -Yes

Question No. 1c

c. Please ensure that the figures clearly depict all wave modalities and insonification angles used, and the limitations encountered.

Response

c. The figures, (provided in Reference 1), depict the requested information, with the associated limitations listed below.
- Weld # 18 – Pipe to Tee – limitation was tee crotch areas (2)
- Weld # 6 – Pipe to Valve (870A) – limitation due to cast stainless steel valve body side;
- Weld # 14 – Valve to Pipe (871B) - limitation due to cast stainless steel valve body side;
- Weld # 15 – Pipe to Valve (870B) - limitation due to cast stainless steel valve body side;
- Weld # 8 – Valve to Pipe (888B) - limitation due to cast stainless steel valve body side;
- Weld # 56 – Flange to Pipe (FE-125) – limitation was on flange side.

Question No. 1d

d. Provide a replacement figure for Component ID 18 as the figure provided in ISI-03 is too blurred to read.

Response

d. See Attachment # 3 for an improved image of component ID 18 weld.

Question No. 1e

e. On page 3 of 11, the text reads, "There were no recordable indications found during the inspection of these welds." Please clarify whether this statement refers to only the UT exams performed or does it also include the surface exams performed on welds 14, 15, 8, and 56.

Relief Request ISI-03

Response

e. The four welds, 14, 15, 8 and 56 had UT and PT examinations performed. All four identified welds had no recordable indications as a result of either of the examinations.

Question No. 2

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

Question No. 2a

a. Please clarify/provide the coverage calculations for these welds.

Response

a. Weld # G2-BC-2-A and Weld # L2-BC-2-A:
- The Weld # G2-BC-2-A examination record had a total of four directions (CW, CCW, US, DS) for scan coverage. Two examination angles were used to examine the weld volume, 45° & 70°. Based on the component configuration, there is a 3/4" diameter Weld-O-Let in the area of interest. The component circumferential measurement equal 21" in length, the total scan was 18.75". 18.75/21 = 89.3%. In the axial scan direction, there was a heat trace wire in area of interest. This heat trace wire limits the total area from being scanned. A total of 80% coverage was claimed for these axial direction scans. Total coverage for the four directions equals 89.3% + 89.3% + 80% + 80%= 338.6 / 4 = 84.65%.
- The Weld # L2-BC-2-A examination record had a total of four directions (CW, CCW, US, DS) for scan coverage. Two examination angles were used to examine the weld volume, 45° & 60°. Based on the component configuration, there is a 3" diameter Sweep-O-Let in the area of interest. The component circumferential measurement equals 21.5" in length; the total scan was 18.5". 18.5/21.5 = 86%.

Question No. 2b

b. Please ensure that the figures clearly depict all wave modalities and insonification angles used, and the limitations encountered.

Response

b. The figures depict the requested information, with the associated limitations listed below.
- Weld # G2-BC-2-A – limitation encountered was ¾" diameter Weld-O-Let fitting and a heat-trace wire causing interference.
- Weld # L2-BC-2-A – limitation encountered was 3" diameter Sweep-O-Let fitting in the area of interest.

Relief Request ISI-03

Question No. 2c

c. *On page 4 of 11, the text reads, "There were no recordable indications found during the inspection of these welds." Please clarify whether this statement refers to only the UT exams performed or does it also include the surface exams performed on weld L2-BC-2-A.*

Response

c. Clarification of requested information for weld # L2-BC-2-A:
   - Weld # L2-BC-2-A had UT and MT examinations performed. This weld had no recordable indications for both the UT and MT examinations.

Attachment 1

Coverage calculations and cross sections showing UT coverage/limitations for NSE–3R & NSE–4R

COVERAGE DETERMINATION

In the coverage calculations provided for components NSE-3R and NSE 4R, the areas referred to on the ultrasonic coverage and limitation sheets were arrived at by using the Microsoft Visio drawing program. This program allows the user to outline the area in question and provides the calculated area value. Since all the part geometric limitations were consistent for 360 degrees, the area was used to generate the percent of coverage.

For component NSE 3R and NSE 4R, the 45 degree Refracted Longitudinal (RL) wave axial transducer obtained 2.34 Square Inches of the code required area of 4.51 Square Inches from a single direction. Resulting in 52% coverage of the code required area (volume). The limitation was caused by component geometry.

For the 60 degree (RL) wave examination of NSE 3R and NSE 4R, 4.32 square inches of coverage was obtained of the 4.51 square inches of code required area (volume). Resulting in 96% coverage. The limitation was caused by component geometry

The 45 degree circumferential examinations, which were conducted from the safe end side of the weld, were limited by part geometry and surface condition. For NSE 3R 2.62 square inches or 58% of the code required area (volume) was scanned. This number was reduced 50% by the examiner due to the surface condition of the component and an inability to maintain adequate contact during the examination. For NSE 4R 2.88 square inches or 64% of the code required area (volume) was scanned. This number was reduced 45% by the examiner due to the surface condition of the component and an inability to maintain adequate contact during the examination. As indicated on the ultrasonic coverage and limitation sheet.

The 45 degree shear axial and circumferential exams were conducted in both directions over all accessible areas. The coverage obtained is equal to the 45 degree RL examination.
While these examinations were performed, they are not included in the coverage calculations.

COVERAGE CALCULATIONS

In the report GINNA-3R-01 and GINNA-4R-01, coverage calculations were made by taking the percent of coverage of the 45 degree RL axial exam, the 60 degree RL axial exam, the 45 degree RL circumferential clockwise exam, and the 45 degree RL counterclockwise RL exam and dividing by the number of examinations (4). This calculation provides a composite coverage for all four examinations. At the time of the examinations, the guidance for determining coverage requirements was vague in the PDI -UT-10 procedure and this method for determining coverage was adopted.

When determining coverage using the area that two angles cover, the coverage of the 45 degree RL defines the area where two angles both provide coverage. In this instance the coverage of the 45 RL and the 60 degree RL are 2.34 square inches or 52% coverage and there is no change in the coverage of the circumferential examinations.

NSE-3R

The percentage calculation for NSE 3R would be 52% for the 45 RL, 52% for the 60 RL 29% for the circumferential clockwise examination and 29% for the circumferential Counter clockwise examination. This results in a coverage of 40.5%

52 + 52 + 29 + 29 /4 = 40.5% code coverage

COVERAGE CALCULATIONS (CONT.)

NSE-4R

The percentage calculation for NSE 4R would be 52% for the 45 RL, 52% for the 60 RL, 32% for the circumferential clockwise examination, and 32% for the circumferential counter clockwise examination. This results in a coverage of 42%

52 + 52 + 32 + 32 /4 = 42% code coverage

When looking at total coverage of each examination respectively, the calculations are as follows

NSE-3R

For NSE 3R, the 60 RL coverage was 96%, the 45 RL circumferential clockwise examination was 29%, and the circumferential 45 RL counter clockwise examination was 29%. This results in a coverage of just the 60RL and the two 45 RL circ scans is 51.3%

60 RL coverage w/ circumferential scans 96 + 29 + 29 / 3= 51.3% coverage

For NSE 3R, the 45 RL axial coverage was 52%, the 45 RL circumferential clockwise examination was 29%, and the circumferential 45 RL counter clockwise examination was 29%. This results in a coverage of just the 45RL and the two 45 RL circ scans is 36.6%

45 RL coverage w/ circumferential scans 52 + 29 + 29 / 3 = 36.6% coverage

NSE 4R

For NSE 4R, the 60 RL coverage was 96%, the 45 RL circumferential clockwise examination was 32%, and the circumferential 45 RL counter clockwise examination was 32%. This results in a coverage of 53.3%

60 RL coverage w/ circumferential scans 96 + 32 + 32 / 3 = 53.3% coverage

For the 45 RL axial coverage was 52%, the 45 RL circumferential clockwise examination was 32%, and the circumferential 45 RL counter clockwise examination was 32%. This results in a coverage of 38.6%

45 RL coverage w/ circumferential scans 52 + 32 + 32 / 3 = 38.6% coverage

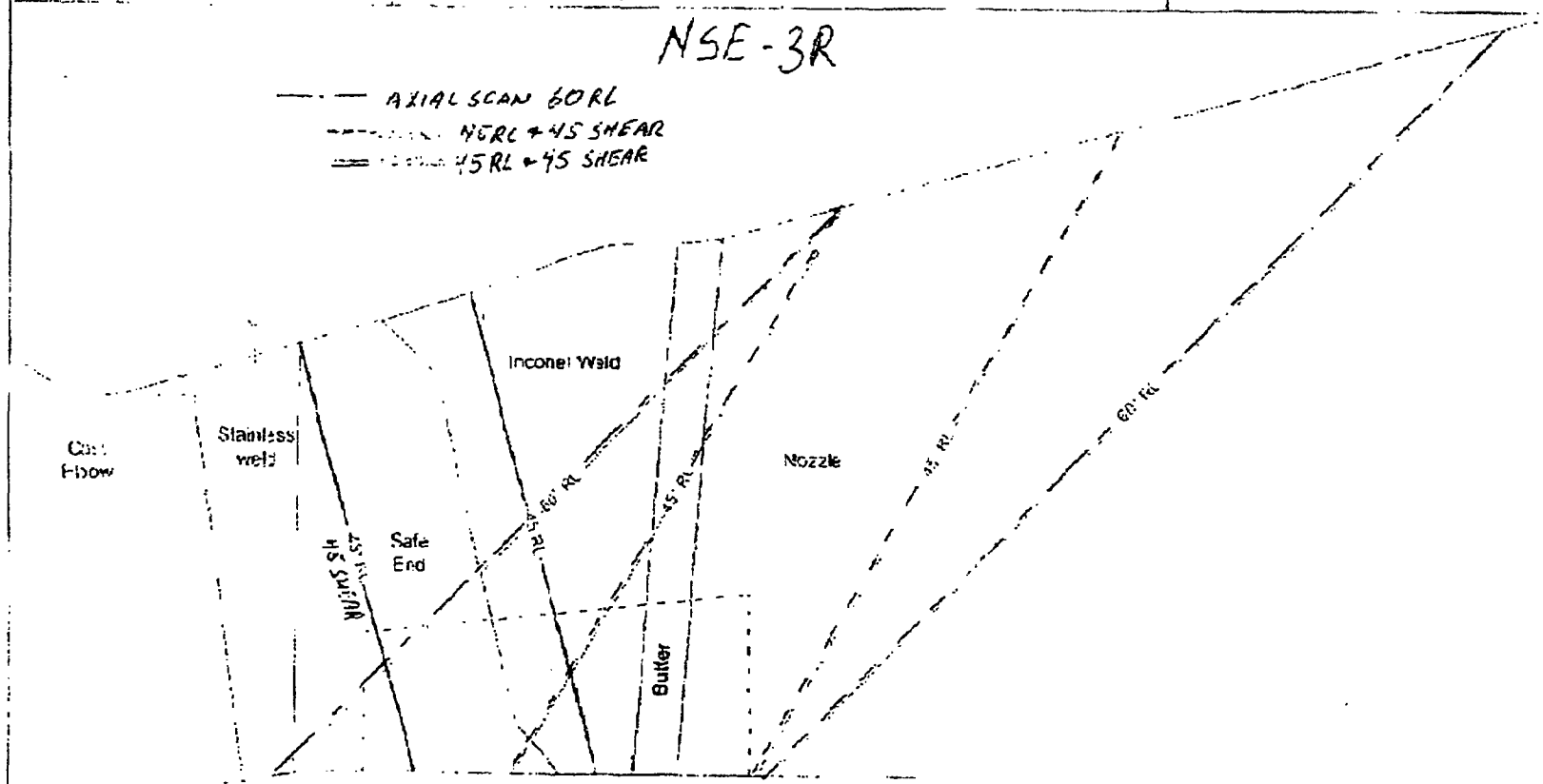
ULTRASONIC COVERAGE AND LIMITATION SHEET

Summary No: 1008900

Report No: GINNA 3R-01

Customer Information			Component Information	
Utility: Constellation	Site: Ginna	Unit: 1	System / Weld ID: B Steam Generator / NSE-3R	Coverage Data Sheet No.: COV-3R-01

Weld Info	Axial Code Coverage's Obtained	Circ Code Coverage's Obtained	Coverage Calculations
Code Area of CM Weld = 4.51 in²	45° RL = 2.34 in² (52%) 60° RL = 4.32 in² (96%) See Notes	45° RL = 1.31 in² (29%) See Notes	RL Composite Coverage = 51.5% See Notes



Notes: Coverage information given is the best estimation due to component geometry.
Achieved coverage of the circumferential examinations, as illustrated, was reduced by 50% due to loss of contact and restricted ability to perform skewed scans as required by Technical Justification IR-2009-381, as a result of surface condition.
Above illustration not to scale

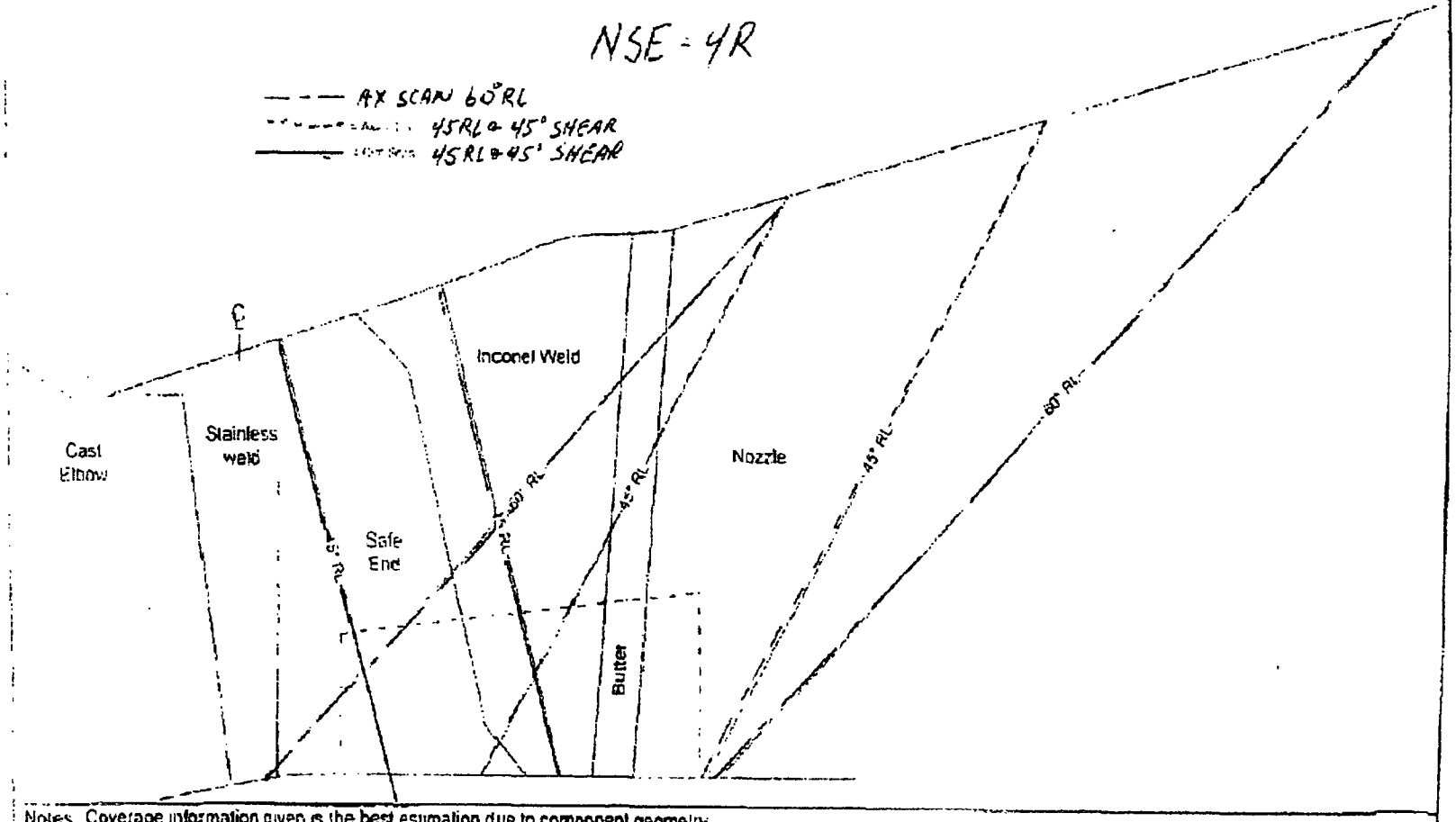
ULTRASONIC COVERAGE AND LIMITATION SHEET

Summary No: I007190

Report No: GINNA-4R-01

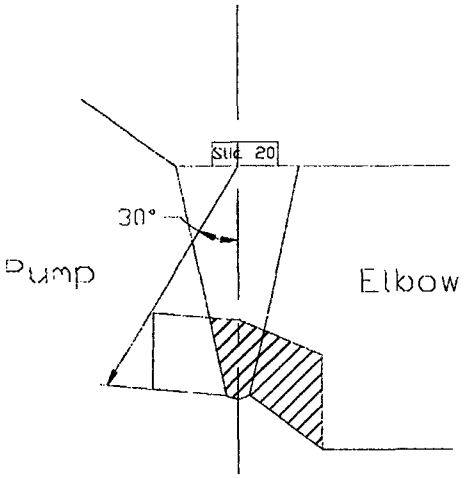
Customer Information			Component Information	
Utility: Constellation	Site: Ginna	Unit: 1	System / Weld ID: "B" Steam Generator / NSE-4R	Coverage Data Sheet No.: COV-4R-01

Weld Info	Axial Code Coverage's Obtained	Circ Code Coverage's Obtained	Coverage Calculations
Code Area of DM Weld = 4.51 in^2	45° RL = 2.34 in^2 (52%) 60° RL = 4.32 in^2 (96%) See Notes	45° RL = 1.44 in^2 (32%) See Notes	RL Composite Coverage = 53% See Notes

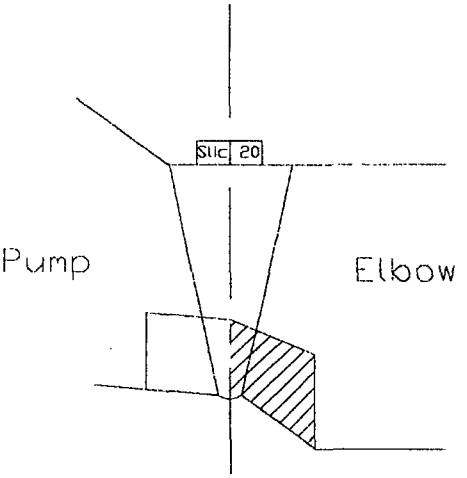


Notes. Coverage information given is the best estimation due to component geometry.
Achieved coverage of the circumferential examinations, as illustrated, was reduced by 45% due to loss of contact and restricted ability to perform skewed scans, as required by Technical Justification PR-2009-381, as a result of surface condition.
Above illustration is Not To Scale

Attachment 2a
Examination Coverage for RC-PL-FW-XV



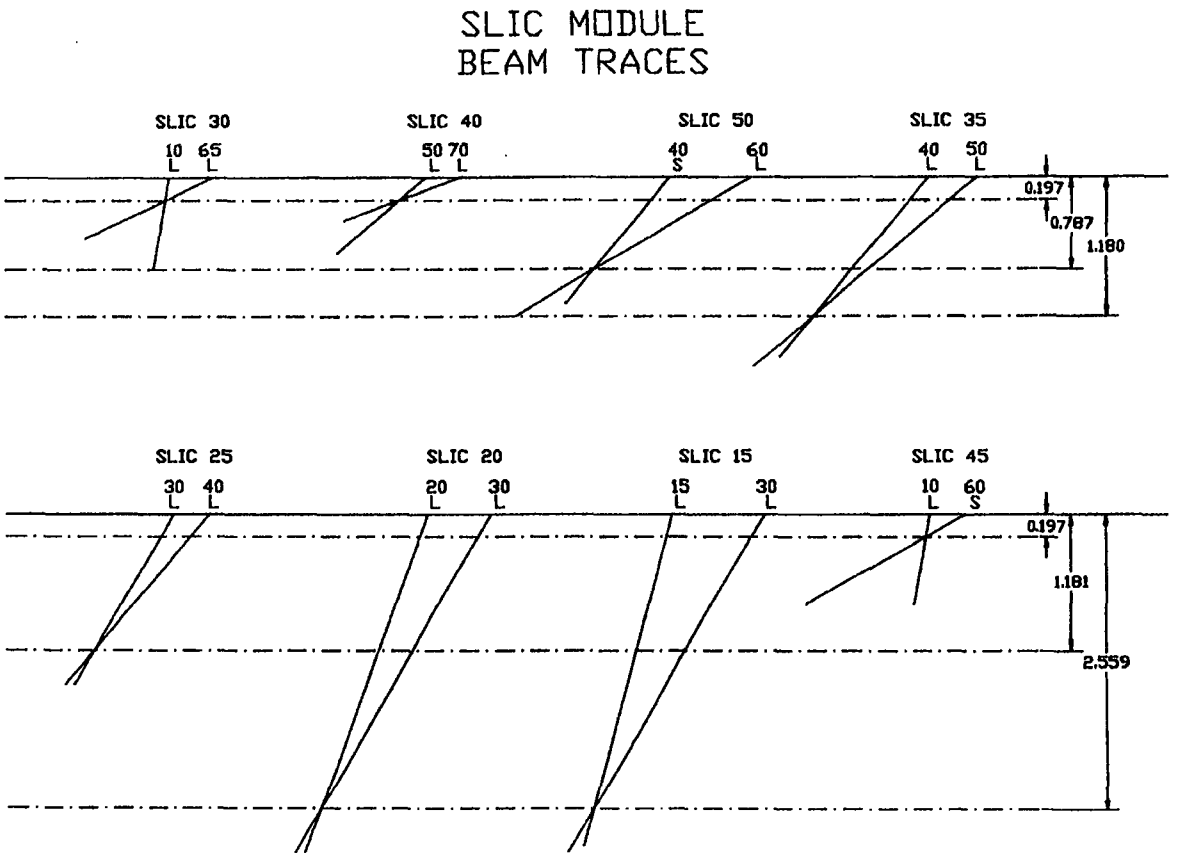
Axial Exam



Circ Exam

Examination Coverage:
Axial Coverage Down = 62%
Axial Coverage Up = 0%
Parallel Coverage CW = 50%
Parallel Coverage CCW = 50%
Average = 40.5%

Attachment 2b
SLIC Module Beam Traces Showing Focal Depth of
SLIC 20 for Responding to Needed Depth



Attachment 3
Weld Cross-Sectional Views

Item C5.21
Component ID: 18 (I162770)
Limitation due to tee curvature
Wave Modality and Insonification angles (60°s and 70°s) (Axial and Circ Directions) were used for scanning, where accessible.