Union Electric
Callaway Plant

PO Box 620
Fulton, MO 65251

June 29, 2007

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Stop P1-137
Washington, DC 20555-0001

Ladies and Gentlemen: ULNRC-05423

DOCKET NUMBER 50-483
CALLAWAY PLANT UNIT 1
UNION ELECTRIC CO.
RESPONSES TO REQUESTS FOR ADDITIONAL INFORMATION REGARDING REQUESTS FOR RELIEF FROM ASME SECTION XI CODE EXAMINATION REQUIREMENTS
(INCLUDING WITHDRAWAL OF RELIEF REQUEST ISI-37)

Reference 1: AmerenUE Letter ULNRC-05183, "Requests for Relief from ASME Section XI Code Inservice Examination Requirements," dated October 25, 2006

By letter dated October 25, 2006 (Reference 1) and pursuant to 10 CFR 50.55a(a)(3), AmerenUE (Union Electric Company) submitted several requests for relief from applicable examination requirements of Section XI of the American Society of Mechanical Engineers (ASME) Code. The relief requests are for the second 10-year interval of the Inservice Inspection (ISI) Program at the Callaway plant, which ended on December 18, 2005. As noted in the letter, the Code Edition(s) and Addenda applicable to Callaway's second 10-year ISI interval are ASME Section XI, "Rules for Inservice Inspection of Nuclear Power Plant Components," 1989 Edition, with no Addenda (and 1995 Edition with 1996 Addenda, as applicable).

The relief requests submitted via AmerenUE's October 26, 2006 letter were identified as ISI-34, -35, -36, -37, -38, -39, -40, and -41. Half of these relief requests have now been approved by the NRC. The relief requests that have not yet been approved and are still under review by the NRC are ISI-34, ISI-37, ISI-38 and ISI-40. From its ongoing review of these relief requests, the NRC staff has transmitted several requests for additional information (RAIs) for which responses from AmerenUE are needed in order to support completion of the NRC's review.

Accordingly, this letter provides AmerenUE's responses to the NRC's RAIs. The RAI responses are provided as attachments such that Attachment 1 provides the response to the RAI received for ISI-34, Attachment 2 provides the response to the RAI received in regard to both ISI-37 and ISI-38, and Attachment 3 provides the response to the RAI received for ISI-40. Within each attachment,

each of the individual questions/requests contained in the associated RAI is stated and immediately followed with AmerenUE's response. Text from the NRC's RAI(s) is shown in italics.

Regarding Relief Request ISI-37. it should be noted that AmerenUE is withdrawing this particular request. The determination to withdraw ISI-37 was made in response to one of the NRC's RAI questions pertaining to this request, as explained further in Attachment 2.

AmerenUE appreciates the NRC staff's continued review of the remaining relief requests. For any questions regarding the attached information. please contact me at 573-676-8129 or Scott A. Maglio at 573-676-8719.

Sincerely,

David Shafer
for Luke H. Graessle
Manager - Regulatory Affairs

TBE/jdg

Attachments

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(Certrec receives ALL attachments as long as they are non-safeguards and may be publicly disclosed.)

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Attachment 1
to ULNRC-05423

REQUEST FOR ADDITIONAL INFORMATION
REGARDING RELIEF REQUEST ISI-34

REQUEST FOR ADDITIONAL INFORMATION
REGARDING RELIEF REQUEST ISI-34

In the submittal dated October 25, 2006, Union Electric Company (the licensee) requested relief from certain requirements contained in the licensee's risk-informed inservice inspection (ISI) program which was developed according to Electric Power Research Institute (EPRI) Topical Report (TR) TR-112657, Revision B-A, "Revised Risk-Informed Inservice Inspection Procedure." Specifically, the licensee requested relief from the inservice inspection 100% volumetric coverage requirement for weld regions. The licensee's Relief Request (RR) ISI-34 is for the second 10-year inservice inspection interval.

Paragraph 50.55a(g)(5)(iii) of Title 10 of the Code of Federal Regulations (10 CFR) states that when licensees determine that conformance with certain code requirements is impractical at their facility, they shall submit information to support this determination. The Nuclear Regulatory Commission (NRC) will evaluate such requests based on impracticality, and may impose alternatives, given due consideration to public safety and the burden imposed on the licensee.

To continue the review of RR ISI-34, the NRC staff requests the following additional information.

1. *In the licensee's letter dated February 16, 2001, Section 3.5.2, "Program Relief Request," it states, "At this time, all the RI-ISI examination locations that have been selected provide greater than 90% coverage." In the licensee's letter dated October 25, 2006, Section 5, "Burden Caused by Compliance," it states, "It was known at the time of selection that a conflict existed between the required weld volume and ultrasonic inspection qualification." Explain the apparent conflict between these two statements.*

   Response

   The statement in the October 25, 2006 letter was poorly worded. As stated in the February 16, 2001 letter, an attempt was made to make selections based upon coverage. However, choosing locations susceptible to active degradation mechanisms was deemed more important than choosing locations that may have resulted in better coverage but which had no active degradation mechanism. For the February 16, 2001 letter, it would have been better to state, "It was known at the time of selection that a **potential** conflict existed between the required weld volume and ultrasonic inspection qualification (PDI rules)." AmerenUE chose the noted locations because active degradation mechanisms were identified during the evaluation process. AmerenUE therefore believes that the selected locations are the right ones to examine.

2. *The letter dated October 25, 2006, reduces the examination coverage for welds in the licensee's RI-ISI program. Discuss how the licensee's program will satisfy the minimum coverage criteria in the weld population that contributes to the percentage of the piping weld population referenced in TR-112657.*

Response

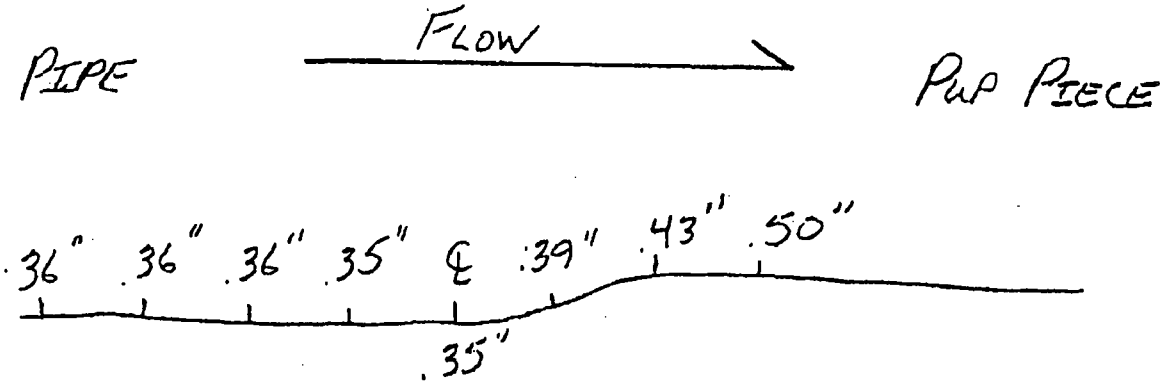
As stated in the October 25, 2006 letter, "Using the degradation mechanism insight of Code Case N-711 and its associated white paper, Callaway Plant could take credit for examining 100% of the area of interest for the subject welds." The insights of Code Case N-711 were developed in the years following issuance and approval of TR-112657. The intent of the request for relief (ISI-34) was to incorporate those insights, ensuring that appropriate locations remain selected (i.e., welds with active degradation mechanisms) and that for each of the subject welds the appropriate required examination volume for the degradation mechanism is utilized and achieved as shown on figures "Coverage B1" and "Coverage B2."

3. *The letter dated October 25, 2006 briefly listed the limitations for less than 100% coverage in the table titled "Description of Coverage Limitations." However, the table provided insufficient information to demonstrate impracticality. For each subject weld, provide a cross- sectional sketch identifying the material (carbon steel, cast or wrought stainless steel, cast or wrought nickel based alloys) in the weld region, identifying the wall thickness at the weld, and showing the interference location.*

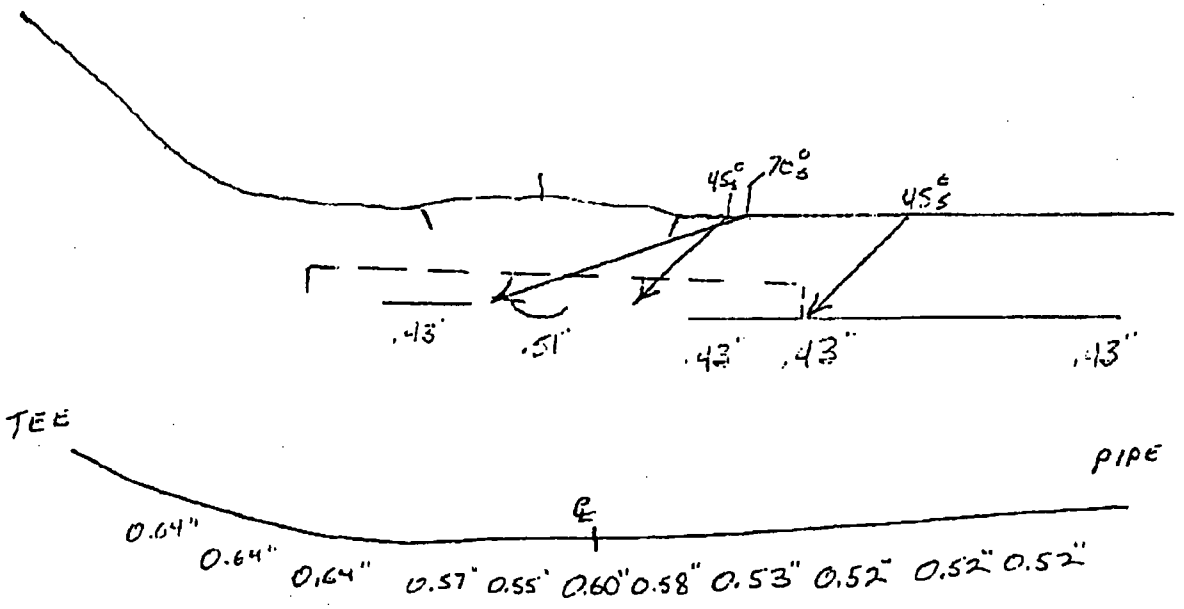
Response

All welds are stainless steel components to wrought stainless steel pipe welds.

The following sketches (shown on the next page), which are from the UT reports. are typical for the component welds in ISI-34



Valve:



4. *The letter dated October 25, 2006, states that ISI-34 examinations were performed during the spring of 2004 refueling outage (RF) 13. The ultrasonic testing (UT) techniques for pipe examination performed in 2004 must be qualified to the requirements of Section XI, Appendix VIII. For the pipe configurations common in the power plant, the Electric Power Research InstitutePerformance Demonstration Initiative (PDI) has representative mockups that are used for Section XI, Appendix VIII performance*

demonstrations. For pipe configurations not in the PDI program, the licensee must satisfy Section XI, Appendix VIII requirements in-house.

Discuss the differences between the mockup and weld configurations in the PDI program and the mockups and weld configurations needed for the subject welds. Discuss the availability of site-specific mockups of the subject welds and any demonstrations to establish the effectiveness of procedures and personnel qualified through the PDI program or site-specific program.

Response

The subject examinations were performed in accordance with the PDI program for Supplement 2. Single-sided access austenitic piping welds are included in the performance demonstration test samples for these configurations; therefore, site-specific mock-ups are not applicable.

5. *The regulation 10 CFR 50.55a(g)(5)(iii) is predicated on the licensee's determination of impracticality. Discuss other non-destructive examination (NDE) methods and ultrasonic test (UT) techniques that were evaluated to increase the examination coverage, such as phased array on tapered surfaces, weld crown removal to increase scanning, digital radiography, state-of-the-art volumetric examinations, etc. Include a summary of the demonstration results, if any.*

Response

Callaway Plant is committed to utilizing the best available technology for performing ISI NDE. However, the welds in question are on piping 6 inches or less in diameter. As such, there is no qualified technique for performing UT examinations from the inside diameter, including phased array, etc. The condition of the weld crown was blended with an ISI prep, as required by the Callaway ISI Program for all ISI piping welds. Radiography was performed prior to service as required by ASME Section III, Construction Code.

The examinations under consideration in ISI-34 were examined in accordance with PDI-UT-2. PDI-UT-2 Step 1.8 states, "This procedure is not qualified for...detection or length sizing of circumferentially oriented flaw indications when only single-sided access is available and the flaw is located on the far side of the weld; however, guidance is provided. The techniques identified in this procedure have been demonstrated to be representative of the 'best effort' technology for single-side detection of far-side defects parallel to the weld." Therefore, the examinations performed at Callaway were, in fact, based upon the best demonstrated technology available.

6. *Page 4-13 of EPRI TR TR-112657 provides a discussion on limited examinations of austenitic-to-austenitic welds. The description of the weld configuration is similar to weld configurations used for ASME Code Section XI, Appendix VIII, Supplement 10 qualifications performed from the austenitic side of the weld. Discuss the applicability of using Supplement 10 qualified procedures and personnel in lieu of Supplement 2 qualified procedures and personnel to increase weld coverage.*

Response

The welds in question are not dissimilar metal welds: therefore, Supplement 10, "Qualification Requirements for Dissimilar Metal Piping Welds," was not applicable for these welds and was not used. Had AmerenUE chosen to use Supplement 10 for these welds at Callaway, it would have required submission of a request for relief in advance. However, per discussion with EPRI personnel, because of the configurations involved (small bore piping to component welds) no increase in coverage could have been claimed. Therefore, ISI-34 would still have been required and the relief needed to use Supplement 10 instead of Supplement 2 as required would have caused unnecessary burden and cost, both to the station and the regulator.

The industry efforts to achieve a qualified single-sided access examination per Supplement 2 are being coordinated through PDI and EPRI. AmerenUE supports these efforts, both financially and by participating in the PDI program. This is the appropriate research forum, as industry experts are actively engaged in advancing the technology of ultrasonic examinations.

7. *Discuss (1) the achievable examination coverage for (upstream and downstream) welds adjacent to the subject welds and (2) the applicability of supplementing the subject weld examinations with adjacent weld examinations.*

Response

The upstream and downstream piping welds have been reviewed. Most have similar limitations, do not have appropriate degradation mechanisms, or already have been selected for examination. These welds cannot be used as substitutes or to increase examination coverage for the welds listed in ISI-34.

Attachment 2
to ULNRC-05423

REQUEST FOR ADDITIONAL INFORMATION REGARDING RELIEF REQUESTS ISI-37 AND ISI-38

REQUEST FOR INFORMATION
REGARDING RELIEF REQUESTS ISI-37 AND ISI-38

Relief Requests ISI-37 and ISI-38 were submitted by Union Electric Company (the licensee) in its application dated October 25, 2006. The Relief Requests are for the second 10 -year inservice inspection (ISI) interval, 1989 Edition with no Addenda of American Society of Mechanical Engineers (ASME) Code, Section XI as the ASME Code of record.

In its letter dated October 25, 2006, the licensee requested relief from the ASME Code, Section XI, requirements for reactor pressure vessel (RPV) lower shell-to-lower head circumferential weld 2-RV-101-141 and for RPV inlet safe end-to-elbow welds 2-BB-01-F102, 2-BB-01-F202, and 2-BB-01-F302, in RR ISI-37 and RR ISI-38 respectively. Six questions/requests have been identified from the NRC's review of ISI-37 and ISI-38. (Question 5 is a two-part question.)

Relief Request ISI-37

For RPV lower shell-to-lower head circumferential weld 2-RV-101-141 the ASME Code, Section XI, Table IWB-2500-1, Category B-A, Item B1.21 specifically states that a volumetric examination of essentially 100% shall be performed on the accessible length of all welds on the RPV lower shell to lower head circumferential weld.

1. *According to the WestDyne International RPV Results Summary report for the subject weld provided by the licensee in its letter dated October 25, 2006, it was noted that the licensee obtained approximately 77.3 percent coverage of the examination volume; however, the licensee did not specify if the 77.3 percent coverage of the examination volume was of the accessible weld length or total weld length. Therefore, for this specific case, the licensee may want to consider reassessing the ASME Code requirements in that if the licensee actually obtained essentially 100% of the accessible weld length relief may not be required.*

   Response

   AmerenUE understands the point made by this question from the NRC and concurs with its conclusion. 100% of the accessible weld length was obtained. The 77.3% refers to the total weld length. Historically, AmerenUE has tended to conservatively request relief to assure complete compliance with Code requirements at Callaway. In this case, it was not clear what was meant by the Code terminology, so relief was requested. In light of this clarification, AmerenUE requests withdrawal of RR ISI-37. For completeness, Question 2 is still answered as follows.

2. *In the report it was also noted that during the ultrasonic (UT) examination one ASME Code-allowable indication was identified. If relief is required, provide a brief discussion of the disposition of the indication found during the UT examination. In addition, did the indication extend into the uninspectable volume?*

Response

The indication was allowable in accordance with Table IWB-3510-1. The indication did not extend into the uninspectable volume.

Relief Request ISI-38

For the RPV inlet safe end-to-elbow welds 2-BB-01-F102, 2-BB-01-F202, and 2-BB-01-F302, the ASME Code, Section XI, Table IWB-2500-1, Category B-J, Item B9.11 requires volumetric and surface examination of essentially 100% of the subject weld length.

1. *According to the WestDyne International RPV Results Summary report for weld 2-BB-01-F102, the licensee obtained approximately 50% coverage of the examination volume. In the report it was noted that during the ultrasonic (UT) examination six ASME Code-allowable indications were identified. Provide a brief discussion of the disposition of these six indications identified during the UT examination. In addition, did any of the indications extend into the uninspectable volume?*

Response

During the examination of 2-BB-01-F102, 100% of the volume was examined in the axial direction (looking for circumferential indications). The PDI qualification that the vendor was qualified to had the following statement of limitation: "This procedure/candidate is not qualified to detect axial flaws in either Supplement 2 or 10 welds which are not either ground smooth or machined smooth with no exposed root or counterbore." For 2-BB-01-F102, this condition was encountered. This resulted in no coverage under the rules of PDI for circumferential scans. This resulted in an aggregate coverage of 50% (100% from the axial direction, 0% from the circumferential direction). As such, the indication did not run into the uninspectable volume. See AmerenUE's response to Question 5 below for a discussion of other techniques that were used to supplement this examination and obtain the best technologically sound examination available.

The indications noted were all subsurface circumferential indications and of a size allowable per Table IWB-3514-2.

2. *For weld 2-BB-01-F202 the WestDyne International report noted that the licensee obtained approximately 50% coverage of the examination volume. It was also noted that during the UT examination one ASME Code-allowable indication was identified. Provide a brief discussion of the disposition of the indication identified during the UT examination. In addition, did the indication extend into the uninspectable volume?*

Response

During the examination of 2-BB-01-F202 100% of the volume was examined in the axial direction (looking for circumferential indications). The PDI qualification that the vendor was qualified to had the following statement of limitation: "This procedure/candidate is not qualified to detect axial flaws in either Supplement 2 or 10 welds which are not either ground smooth or machined smooth with no exposed root or counterbore." For 2-BB-01-F202, this condition was encountered. This resulted in no coverage under the rules of PDI for circumferential scans. This resulted in an aggregate coverage of 50% (i.e., 100% from the axial direction, 0% from the circumferential direction). As such, the indication did not run into the uninspectable volume. See AmerenUE's response to Question 5 below for a discussion of other techniques that were used to supplement this examination and obtain the best technologically sound examination available.

The indication noted was a subsurface circumferential indication, of a size that was allowable per Table IWB-3514-2.

3. *For weld 2-BB-01-F302 the WestDyne International report noted that the licensee obtained approximately 50% coverage of the examination volume. It was also noted that during the UT examination one ASME Code-allowable indication and one ASME Code non- allowable indication were identified. Provide a brief discussion of the disposition of these two indications identified during the UT examination. For the non-allowable indication, please provide the size of the indication in comparison to the criteria given in ASME Code, Section XI, IWB -3500. In addition, did either of the indications extend into the uninspectable volume?*

Response

During the examination of 2-BB-01-F302 100% of the volume was examined in the axial direction looking for circumferential indications. The PDI qualification that the vendor was qualified to had the following statement of limitation: "This procedure/candidate is not qualified to detect axial flaws in either Supplement 2 or 10 welds which are not either ground smooth or machined smooth with no exposed root or counterbore." For 2-BB-01-F302, this condition was encountered. This resulted in no coverage under the rules of PDI for

circumferential scans. This resulted in an aggregate coverage of 50% (i.e., 100% from the axial direction, 0% from the circumferential direction). As such, the indication did not run into the uninspectable volume. See Question 5 below for a discussion of other techniques that were used to supplement this examination and obtain the best technologically sound examination available.

As noted in Question 3, there were two flaw indications on 2-BB-01-F302. Flaw Indication #1 was determined to be subsurface and of an allowable size per Table IWB-3514-2. Indication #2, however, was determined to be surface breaking and greater than the allowable flaw size per Table IWB-3514-2. Two independent evaluations were performed in accordance with IWB-3640, one by Structural Integrity Associates Inc., and the other by Westinghouse Electric Company LLC. At AmerenUE's request, for the sake of conservatism and in both evaluations. Flaw #1 was assumed to be surface breaking.

The results of both evaluations were that the Code-acceptable end-of-evaluation period flaw depth was well above that for the conservatively calculated end-of-evaluation period using several very conservative crack-growth rate estimates.

These evaluations, as well as the associated Corrective Action Request (CAR) and Root Cause Evaluation, were provided to the regulator in accordance with IWB-3124.

4. *For welds 2-BB-01-F102, 2-BB-01-F202, and 2-BB-01-F302, identify the weld and base metal material.*

Response

The weld and base metal material for all of the subject welds is stainless steel. The safe end is forged stainless steel (SA 182 F316), the weld is a stainless steel weld (ER308), the elbow is statically cast stainless steel (SA 351 CF8A, which is the same as wrought Type 304).

5. *In addition to the volumetric examination discussed above, the ASME Code requires a surface examination for these welds. Provide the surface examination results of the subject welds, if performed.*

Response

These welds (all reactor pressure vessel nozzle safe end-to-pipe welds) are included in the RI-ISI Program at Callaway. The Category and Item number were allowed to remain B-J and B9.11, respectively, for tracking purposes during the second inservice inspection interval. This was not communicated well in the request for relief. For RI-ISI, the surface examination is not required. It should

also be noted that all eight inlet and outlet safe end-to-pipe welds were examined during RF13 even though only three were required for the RI-ISI Program Plan.

According to the WestDyne report, the licensee performed eddy current testing (ET) on weld 2-BB-01-F302. Discuss if the ET examination was a substitute for the required surface examinations and was ET examination performed on welds 2-BB-01-F102 and 2-BB -01-F202 as well?

Response

The ET examination was performed to supplement the UT examination of these welds as the PDI qualification did not include welds with root geometry. This was understood going into the examination. i.e., that the RPV nozzle safe end-to-pipe welds (which included 2-BB-01-F102. 2-BB-01-F202. and 2-BB-01-F302) were field welds, and as such were likely to have root geometry adverse to obtaining full coverage. In anticipation of this. AmerenUE chose to perform ET and a UT ID surface profilometry (0° scan) to aid in evaluating the condition of the subject welds at Callaway.

6. *During the ET examination of weld 2-BB-01-F302. the licensee identified two indications, and these indications were assessed on Sheet No. 247-SE-09 which was not provided in the licensee's letter dated October 25. 2006. Provide a description of the ET findings including assessment Sheet No. 247-SE-09.*

Response

As noted in the response to the second half of Question 5. the ET examination of the nozzle safe end-to-pipe welds was not a Code-required examination, but was identified by the vendor and accepted by AmerenUE as a good practice to provide a better examination of the subject welds at Callaway. The two indications were evaluated as follows:

ET examination of indication #2 confirmed UT indication #2 which had been determined to be ID-connected. (See response to Question 3 above.) ET examination of indication #1 was conducted and evaluated, and it was determined to not be confirmatory with UT indication #1. However. as a conservative measure, UT indication #1 was assumed to be surface-connected in all engineering evaluations performed.

A copy of ET Indication Assessment Sheet No. 247-DE-09 is provided/attached (as page 6 of 6).

WESDYNE INTERNATIONAL

ET INDICATION ASSESSMENT SHEET # 247-SE-09

Utility:	AmerenUE	**Plant:**	Callaway	**Unit:**	1	**Outage:**	RF 13
Procedure No:	WDI-STD-146					**Procedure Rev. No.:**	1
Weld No:	2-BB-01-F302	**Scan Increment (inch):**	0.125"	**Scan Increment (deg):**	.5	**Total Number of Sweeps:**	289
ET Examiner Signature:	Level II					**Date:**	4-30-04

File Name	Disk No	Indication No.	Probe No.	Scan Direction (in/out)	1st Sweep, $N_{1st\ sweep}$	Last Sweep, $N_{last\ sweep}$	Total Number of Sweeps for Indication, N_{total}	Indication Parameters				Center of Indication		Length, L (inch)
										250 kHz Frequency				
								Sweep #	Data Point #	Amp. (%)	Phase (deg)	$R_{Vcenter}$ (inch)	$\theta_{Ncenter}$ (deg)	
WN247-SE-PRP-SIZA	5	1	4	AXIAL	119 353.5°	147 8.2°	28	129	544	66	65	130.9	0.9°	3.5"
WN247-SE-PRP-SIZA	5	2	4	AXIAL	21 302.3°	35 309.6°	15	25	532	59	81	130.7	304.4°	1.875"

Form 12.6

Attachment 3
to ULNRC-05423

REQUEST FOR ADDITIONAL INFORMATION REGARDING RELIEF REQUEST ISI-40

REQUEST FOR ADDITIONAL INFORMATION
REGARDING RELIEF REQUEST ISI-40

In the submittal dated October 25, 2006 (ULNRC-05183), Union Electric Company (the licensee) requested relief (No. ISI-40) from certain requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Code at the Callaway Plant. Specifically, the licensee requested relief from the 100% volumetric coverage, preservice inspection requirements. The request is for the second 10-year inservice inspection interval. To continue its review, the NRC staff requests the following additional information:

1. *Provide a cross section sketch identifying the material (carbon steel, cast or wrought stainless steel, cast or wrought nickel based alloys) in the weld region, wall thickness at the weld, and describe or sketch the location and type of interference for each weld.*

Response

All of the welds addressed by Relief Request ISI-40 are stainless steel component (flange or valve, as appropriate) to wrought stainless steel pipe welds, examined in accordance with category B-J. The examination category R-A shown on page 1 of 3 of the relief request document refers to the RI-ISI category. There are currently no RI-ISI preservice inspection (PSI) requirements provided by the ASME Code, so the PSI examination requirements revert to the Pre-RI-ISI category requirements (i.e., B-J). ASME Section XI 1989 edition Table IWB-2500-1 Category B-J Item B9.11 requires 100% volumetric examination as defined in Figure IWB-2500-1.

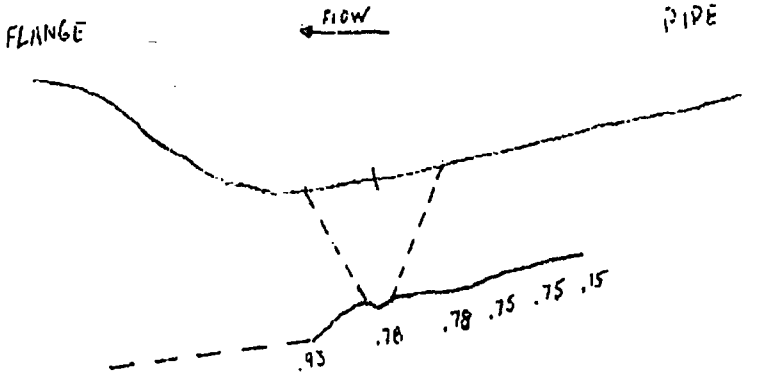
The following sketches, from the UT reports, are typical for the component welds addressed by ISI-40:

6" Pipe to Flange Weld

Comments: Weld Profile and Scan Limitation

Scan limited to one side only due to flange, examination volume considered 50% complete in accordance with APP. VIII requirements. Best effort examination performed on the flange side using refracted L wave.
Reference UT Report #'s UT-05-041, UT-05-042, UT-05-043.

Sketch or Photo:

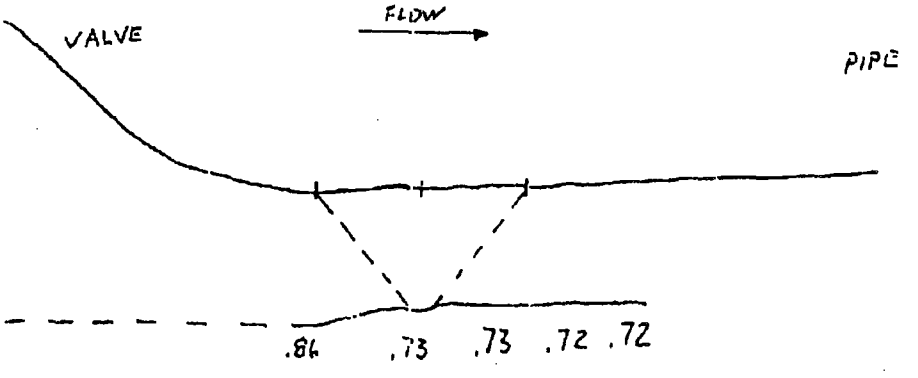


6" Pipe to Valve Weld

Comments: Weld Profile and Scan Limitation

Scan limited to one side only due to valve, examination volume considered 50% complete in accordance with APP. VIII requirements. Best effort examination performed on the valve side using refracted L wave.
Reference UT Report #'s UT-05-047, UT-05-048, UT-05-049.

Sketch or Photo:



2. *Discuss the nondestructive examination (NDE) method used to verify the construction integrity of the new welds, and discuss the volumetric coverage achieved with the NDE method.*

Response

ASME Section III governs construction NDE for the welds in question. Specifically, all welds received radiographic and liquid penetrant examination. No coverage issues were noted during the Section III RT/PT examinations.

3. *Discuss the NDE method used to verify the original plant construction welds, and discuss the volumetric coverage achieved with the NDE method.*

Response

ASME Section III governed construction NDE for the welds in question. Specifically, all welds received radiographic and liquid penetrant examinations. No coverage issues were noted during the Section III RT/PT examinations.

4. *Discuss other NDE methods and ultrasonic testing (UT) techniques that were evaluated for the repair and replacement activity, such as UT examinations from the inside diameter, phased array on tapered surfaces, weld crown removal to increase circumferential scanning, radiography, etc.*

Response

AmerenUE is committed to utilizing the best available technology for performing ISI NDE at Callaway. However, the welds in question are for piping 6 inches or less in diameter. As such, there is no qualified technique for performing UT examinations from the inside diameter, including phased array, etc. The condition of the weld crown was blended with an ISI prep, as required by the Callaway ISI Program for all ISI piping welds. Radiography was performed, as required by ASME Section III, Construction Code.

The examinations under consideration in ISI-40 were examined in accordance with PDI-UT-2. PDI-UT-2 Step 1.8 states (in part and with emphasis added), "This procedure is not qualified for...detection or length sizing of circumferentially oriented flaw indications when only single-sided access is available and the flaw is located on the far side of the weld: however, guidance is provided. The techniques identified in this procedure have been demonstrated to be representative of the 'best effort' technology for single-side detection of far-side defects parallel to the weld."

Therefore, the examinations performed at Callaway were based upon the best demonstrated technology available.

5. *Dissimilar metal (DM) welds are normally examined with single-sided qualified procedures and personnel. The differences between DM welds and austenitic welds are the weld surface condition and adjoining base metal contour. Discuss the applicability of using Section XI, Appendix VIII, Supplement 10 qualified procedures and personnel in lieu of Supplement 2 qualifications to increase the weld coverage. Include a discussion on the efforts to achieve an inspectable single-sided access configuration for Supplement 2 and the demonstrations on mockups for testing different NDE methods and techniques.*

Response

The welds in question are not dissimilar metal welds, therefore Supplement 10, "Qualification Requirements for Dissimilar Metal Piping Welds," was not applicable for these welds and was not used. Had AmerenUE chosen to use Supplement 10 for these welds, it would have required submission of a request for relief in advance. However, per discussion with EPRI personnel, because of the configurations involved (small bore piping to component welds) no increase in coverage could have been claimed. Therefore, ISI-40 would still have been required and the relief needed to use Supplement 10 instead of Supplement 2 as required would have caused unnecessary burden and cost, both to the station and the regulator.

The industry efforts to achieve a qualified single-sided access examination per Supplement 2 are being coordinated through PDI and EPRI. AmerenUE supports these efforts, both financially and by participating in the PDI program. This is the appropriate research forum, as industry experts are actively engaged in advancing the technology of ultrasonic examinations.

6. *Discuss the consideration given to a nozzle design that would support the UT examination coverage for the repair or replacement activity.*

Response

The most inspectable, available component (i.e., flange, valve) design was chosen, as required by 10CFR50, Appendix A, Criterion 32, "Inspection of reactor coolant pressure boundary." None of the welds addressed in ISI-40 are nozzle welds.

7. *These welds are identified as part of the risk-informed population which has specific criteria for addressing limited coverage. Discuss the effects that limited volumetric coverage will have on the future examinations of these welds in the risk-informed program.*

Response

These welds were not selected by the risk-informed program for Callaway. There are no plans to examine these welds in the future.