Tennessee Valley Authority, Post Office Box 2000, Decatur, Alabama 35609-2000

February 11, 2014

10 CFR 50.55a

ATTN: Document Control Desk
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

Browns Ferry Nuclear Plant, Units 1, 2, and 3
Renewed Facility Operating License Nos. DPR-33, DPR-52, and DPR-68
NRC Docket Nos. 50-259, 50-260, and 50-296

Subject: **American Society of Mechanical Engineers, Section XI Code, Inservice Inspection Program for the Unit 1 Second Ten-Year Inspection Interval, Unit 2 Fourth Ten-Year Inspection Interval, and Unit 3 Third Ten-Year Inspection Interval, Request for Relief ISI-44**

Reference: 1. Letter from NRC to TVA, "Browns Ferry Nuclear Plant - NRC Supplemental 95003 Inspection Report 05000259/2013011, 05000260/2013011, and 05000296/2013011," dated August 22, 2013 [ML13234A539]

In accordance with Title 10 of the U.S. Code of Federal Regulations (CFR) Part 50, Section 55a Specification (g)(5)(iii), the Tennessee Valley Authority (TVA) is requesting relief from the weld examination coverage criterion associated with American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, Section XI, for 27 full penetration welds included in the intergranular stress corrosion cracking (IGSCC) Augmented Inspection Program for the Browns Ferry Nuclear Plant (BFN). The reduction in obtained weld examination coverage is due to access limitations caused by design, geometry, or materials of construction of the components. Although these are non-Code examinations, TVA has determined a request for relief in accordance with 10 CFR 50.55a(g)(5)(iii) is the most appropriate method to resolve the issue raised during an NRC inspection, as discussed below. Therefore, relief is requested for the BFN Units 1, 2, and 3 Ten-Year Inspection Intervals, which began June 2, 2008, May 25, 2011, and November 19, 2005, respectively.

On August 22, 2013, the NRC issued an Inspection Report (Reference 1) that identified a non-cited violation (NCV) associated with the examination of one of the welds (i.e., DRHR-2-12) for which relief is being requested. The NCV was associated with TVA's failure to perform a 10 CFR 50.59 evaluation for a departure from the IGSCC inspection methodology on an ASME Code Class 1 piping weld. This weld, and the others

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included in this request for relief, is inspected as part of the BFN Non-Code Augmented Inspection Program.

The ASME Section XI Code of record for the BFN Units 1, 2, and 3 for the current ten-year Inservice Inspection intervals are the 2001 Edition with the 2003 Addenda, the 2004 Edition, and the 2001 Edition with the 2003 Addenda, respectively, as amended by 10 CFR 50.55a(b)(2)(xv)(A)(2).

Specifically, this request for relief addresses 27 welds included in the BFN Augmented Inspection Program associated with Generic Letter 88-01, "NRC Position on IGSCC in BWR Austenitic Stainless Steel Piping," and BWRVIP-75P-A, "BWR Vessel and Internals Project Technical Basis for Revisions to Generic Letter 88-01 Inspection Schedules." Ultrasonic examinations were performed on the accessible areas of these welds to the maximum extent practical given the design configuration or materials of the weld.

The enclosure to this letter contains the BFN Units 1, 2, and 3, Request for Relief ISI-44 for NRC review and approval. Table 1 of the enclosure contains specific information associated with each weld for which TVA is requesting exam coverage relief. Attachment A provided the associated Inservice Inspection Drawings and Attachment B provides excepts from the weld examination reports.

TVA requests approval of this request for relief within one year from the date of this letter.

There are no new regulatory commitments contained in this letter. If you have any questions, please contact Mr. Jamie L. Paul at (256) 729-2636.

Respectfully,

K. J. Polson
Site Vice President

Enclosure:

Browns Ferry Nuclear Plant, Units 1, 2, and 3 American Society of Mechanical Engineers, Section XI Code Inservice Inspection Program, Request for Relief ISI-44

cc (w/Enclosure):

NRC Regional Administrator - Region II
NRC Senior Resident Inspector - Browns Ferry Nuclear Plant

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Enclosure

Tennessee Valley Authority
Browns Ferry Nuclear Plant
Units 1, 2, and 3

Augmented Inservice Inspection Program

Request for Relief ISI-44

Enclosure

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Executive Summary:

In accordance with 10 CFR 50.55a(g)(5)(iii), the Tennessee Valley Authority (TVA) is requesting relief from augmented weld examination coverage requirements for 27 full penetration austenitic stainless piping welds due to access limitations caused by design, geometry, or materials of construction of the components. Ultrasonic examinations (UT) were performed on the subject welds to the maximum extent practical due to the configuration and design using the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the Performance Demonstration Initiative (PDI) Program in accordance with 10 CFR 50.55a(g)(4) and 10 CFR 50.55a(g)(6)(ii)(C). Table 1 of this Enclosure describes the limitations preventing achieving acceptable coverage for the weld examinations. Relief is requested for the Browns Ferry Nuclear Plant (BFN) Units 1, 2, and 3, Ten-Year Inspection Interval, as listed below.

Unit: Browns Ferry Nuclear Plant, Units 1, 2, and 3

Systems:

Residual Heat Removal (RHR) System

Control Rod Drive (CRD) System

Reactor Water Recirculation (RECIRC) System

Reactor Water Cleanup (RWCU) System

Components Affected: 27 Full Penetration Piping Welds

(10) RHR System full penetration piping welds,

(6) CRD System full penetration piping welds,

(5) RECIRC System full penetration piping welds, and

(6) RWCU System full penetration piping welds,

IGSCC Category:

IGSCC Category for each weld is listed in Table 1

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Section XI Edition:

Unit 1 2001 Edition with the 2003 Addenda

Unit 2 2004 Edition

Unit 3 2001 Edition with the 2003 Addenda

Code Requirement:

Code Case N-460

Code Requirements from Which Relief Is Requested:

Code Case N-460 When the entire examination volume or area cannot be examined due to interference by another component or part geometry, a reduction in examination coverage may be accepted provided the reduction in coverage for that weld is less than 10%.

List of Components Associated with this Request for Relief:

See Table 1

Welds RCRD-2-49 and RCRD-2-50 have been removed under Design Change Notice (DCN) 71086A. Although these welds have been removed, TVA is requesting relief for these weld inspections that were performed prior to their removal.

Reason for Request:

The design configurations of the listed welds preclude a UT examination of essentially 100 percent of the required volume. It is not possible to perform the volumetric UT from both sides of each weld due to the configuration of these components.
10 CFR 50.55a(b)(2)(xv)(A)(2) states, "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 component design configuration limits UT examination coverage of the welds to the percentages shown in Table 1 based on limitations discussed in Table 1. Only the stated coverage ranging from 12% to 88% can be claimed for these welds.

Proposed Alternative and Basis for Use:

No alternative method of examination is proposed. In lieu of the ASME Section XI Code required essentially 100 percent volumetric ultrasonic examination, TVA proposes credit for ultrasonic examination of accessible areas to the maximum extent practical for the component design configuration of the piping welds.

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Justification for Granting Relief:

The welds were examined with the latest ultrasonic techniques, procedures, equipment, and personnel qualified to the requirements of the PDI Program, in accordance with the requirements of the 2001 Edition, 2003 Addenda (Units 1 and 3), and the 2004 Edition (Unit 2), as amended by 10 CFR 50.55a(b)(2)(xv)(A) and 10 CFR 50.55a(b)(2)(xxiv), of ASME Section XI, Division 1, Appendix VIII as mandated by 10 CFR50.55a(g)(4). These examinations were of the accessible areas to the maximum extent practical due to the design configuration of the weld joints.

10 CFR 50.55a(b)(2)(xv)(A)(2) states, "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 "Comments" column of Table 1 describes coverage limitations due to the inability to examine welds from both sides, when applicable.

Credit for the one-sided only ultrasonic examination provides coverage ranging from 12% to 88%. These welds are part of a larger population of welds examined in which examination coverage is not reduced for which the required coverage is attained. When considered in aggregate with the entire sample population, an adequate level of inspection occurs to provide reasonable assurance that a pattern of IGSCC degradation that, if present, could affect the overall integrity of the components would be detected. These examinations provide an acceptable level of quality and safety, to the extent practical.

Therefore, pursuant to 10 CFR 50.55a(g)(5)(iii), TVA requests that relief be granted for the BFN Units 1, 2, and 3 for the second, fourth, and third Ten-Year ISI inspection intervals, respectively.

Implementation Schedule:

This request for relief is applicable to the following Ten-Year ISI inspection intervals for BFN:

- Unit 1, Second Ten-Year Interval which began on June 2, 2008, and will end on June 1, 2017;
- Unit 2, Fourth Ten-Year Interval which began on May 25, 2011, and will end on May 24, 2021, and;
- Unit 3, Third Ten-Year Interval which began on November 19, 2005, and will end on November 18, 2015.

The welds described above are listed in Table 1 of this enclosure. The welds associated with Unit 1 were examined during the first period (Cycle 7 - Fall 2008), the second period

(Cycle 8 - Fall 2010), and the third period (Cycle 9 - Fall 2012) of the second Ten-Year inspection interval. The welds associated with Unit 2 were examined during the first period (Cycle 17 – Spring 2013) of the fourth Ten-Year inspection interval. The welds associated with Unit 3 were examined during the second period (Cycle 13 - Spring 2008), the third period (Cycle 14 - Spring 2010), and the fourth period (Cycle 15 - Spring 2012) of the third Ten-Year inspection interval.

Precedent:

This request for relief is similar to the following BFN requests for relief:

- 2-ISI-29, NRC approved by letter dated May 31, 2013 [ML13148A308]
- 3-ISI-25, NRC approved by letter dated January 20, 2012 [ML12003A081]
- 2-ISI-18R1, NRC approved by letter dated June 16, 2009 [ML091200040]
- 3-ISI-22, NRC approved by letter dated May 20, 2008 [ML080080524]
- 2-ISI-18, NRC approved by letter dated April 12, 2004 [ML041040375]
- 2-ISI-15, NRC approved by letter dated April 3, 2003 [ML030970815]

Attachments:

Attachment A - Inservice Inspection Drawings:

- 1-CHM-1081-C-1
- 1-CHM-1081-C-2
- 1-CHM-1088-C-1
- 1-CHM-1098-C-1
- 1-CHM-1098-C-2
- 1-ISI-0362-C-8
- 2-ISI-0221-C-1
- 2-ISI-0270-C-2
- 2-ISI-0272-C-1
- 3-ISI-0328-C-2
- 3-ISI-0330-C-1
- 3-ISI-0332-C-1

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Attachment B - Examination Reports:

- R024
- R078
- R098
- R237
- R253
- R254
- R257
- UT-10-024
- UT-10-026
- UT-10-028
- UT-10-030
- UT-12-027
- UT-12-031
- UT-12-039
- UT-12-054
- UT-12-055
- UT-12-058
- UT-12-060
- UT-13-004
- UT-13-013
- UT-13-024
- UT-13-044
- UT-13-072
- UT-13-076
- UT-13-079
- UT-13-080
- UT-13-086

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Table 1

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
DRHR-1-2 (RHR System)	D	24"	1-ISI-0362-C-8 (R237)	50%	1/7	ASTM A351, CF8M Casting Stainless Steel Valve to ASTM A106 GR. B Carbon Steel Pipe	ER309 stainless steel[1].	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. However, far side coverage for one sided examinations can only be credited if the far side of the weld is of wrought material. Because the far side of the weld is of cast material and although techniques were applied that are intended to interrogate the far side of the weld, no examination credit was applied since the far side of the weld is cast material. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
RCRD-1-50 (CRD System)	C	4"	1-CHM-1098-C-2 (R253)	81%	1/7	Carbon steel Elbow to forged stainless steel (A182 F316) Valve (dissimilar metal weld).	ER309 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. The ultrasonic examination was conducted to the maximum extent practical. Only 81% coverage can be claimed.
RCRD-1-52 (CRD System)	C	4"	1-CHM-1098-C-2 (R254)	88%	1/7	Carbon steel Pipe to forged stainless steel (A182 F316) Valve (dissimilar metal weld).	ER309 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. The ultrasonic examination was conducted to the maximum extent practical. Only 88% coverage can be claimed.
RCRD-1-49 (CRD System)	C	4"	1-CHM-1098-C-2 (R257)	81%	1/7	Carbon steel Elbow to forged stainless steel (A182 F316) Valve (dissimilar metal weld).	ER309 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. The ultrasonic examination was conducted to the maximum extent practical. Only 81% coverage can be claimed.

[1] TVA is unable to locate the Weld Data sheet for this weld. However based on the best available information of the process and procedures used for this configuration TVA concluded that the weld material is ER309.

Table 1 (continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
RWR-1-001-003 (RECIRC System)	A	28"	1-CHM-1081-C-1 (UT-10-024)	50%	1/8	SA376 TP316NG Pipe to A351 CF8 Cast Valve.	IN/ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
RWR-1-002-012 (RECIRC System)	A	28"	1-CHM-1081-C-2 (UT-10-026)	50%	1/8	SA376 TP316NG Pipe to A351 CF8 Cast Valve.	IN/ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
RWR-1-001-S023A (RECIRC System)	A	4"	1-CHM-1081-C-1 (UT-10-028)	50%	1/8	SA403 WP316NG Branch to SA376 TP316NG Pipe.	316 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought piping branch connection that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.

Table 1(continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
RWCU-1-001-019 (RWCU System)	A	6"	1-CHM-1098-C-1 (UT-10-030)	50%	1/8	SA376 TP316NG Pipe to SA351 CF8M Cast Valve.	IN/ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
DRHR-1-3 (RHR System)	D	24"	1-CHM-1088-C-1 (UT-12-055)	13%	1/9	A182 F304 Flued Head to A351 CF8M Cast Valve.	ER308 stainless steel.[2]	Examination coverage limitations are due to the physical configuration of a wrought fluted head penetration to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the fluted head side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 13% coverage can be claimed.
DRHR-1-12 (RHR System)	D	24"	1-CHM-1088-C-1 (UT-12-054)	12%	1/9	A182 F304 Flued Head to A351 CF8M Cast Valve.	ER308 stainless steel.[3]	Examination coverage limitations are due to the physical configuration of a wrought fluted head penetration to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the fluted head side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 12% coverage can be claimed.

[2] TVA is unable to locate the Weld Data sheet for this weld. However based on the best available information of the process and procedures used for this configuration TVA concluded that the weld material is ER308.
[3] TVA is unable to locate the Weld Data sheet for this weld. However based on the best available information of the process and procedures used for this configuration TVA concluded that the weld material is ER308.

Table 1(continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
RWCU-1-005-006 (RWCU System)	D	4"	1-CHM-1098-C-2 (UT-12-058)	23%	1/9	A182 F316 Valve (Forged) to A351 CF8M Cast Valve .	IN/ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to the side of the valve that was wrought and then only for detection of axially oriented flaws. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The ultrasonic examination was conducted to the maximum extent practical. Only 23% coverage can be claimed.
RWR-1-002-053 (RECIRC System)	A	28"	1-CHM-1081-C-2 (UT-12-060)	50%	1/9	SA376 TP316NG Pipe to A351 CF8 Cast Valve.	IN/ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
RCRD-2-49 (CRD System)	D	4"	2-ISI-0272-C-1 (UT-13-013)	63%	2/17	Carbon steel Elbow to forged stainless steel (A182 F316) Valve (dissimilar metal weld).	ER309 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. The ultrasonic examination was conducted to the maximum extent practical. Only 63% coverage can be claimed. The stainless steel valve was removed and replaced by a carbon steel spool piece. Weld RCRD-2-49 was replaced by weld CRD-2-005-006, Carbon Steel Pipe to Pipe. RCRD-2-49 is no longer in the IGSCC Program.
RCRD-2-50 (CRD System)	D	4"	2-ISI-0272-C-1 (UT-13-086)	56%	2/17	Carbon steel Elbow to forged stainless steel (A182 F316) Valve (dissimilar metal weld).	ER309 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. The ultrasonic examination was conducted to the maximum extent practical. Only 56% coverage can be claimed. The stainless steel valve was removed and replaced by a carbon steel spool piece. Weld RCRD-2-50 was replaced by weld CRD-2-005-007, Carbon Steel Pipe to Pipe. RCRD-2-50 is no longer in the IGSCC Program.

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Table 1 (continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
KR-2-25 (RECIRC System)	C	28"	2-ISI-0270-C-2 (UT-13-072)	50%	2/17	A358 TP 304 stainless steel Pipe to A403 WP 304 stainless steel Tee.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought piping "T" fitting that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50 percent coverage can be claimed.
DRHR-2-03 (RHR System)	D	24"	2-ISI-0221-C-1 (UT-13-044)	50%	2/17	A182 F304 Flued Head to A351 CF8M Cast Valve.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought fluted head penetration to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the fluted head side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
DRHR-2-09 (RHR System)	E	24"	2-ISI-0221-C-1 (UT-13-079)	50%	2/17	A358 GR304 stainless steel Pipe to A403 WP304 stainless steel Tee.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought piping "T" fitting that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.

Table 1 (continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
DRHR-2-12 (RHR System)	D	24"	2-ISI-0221-C-1 (UT-13-004)	50%	2/17	A182 F304 Flued Head to A351 CF8M Cast Valve.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought fluted head penetration to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the fluted head side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
DRHR-2-22 (RHR System)	E	20"	2-ISI-0221-C-1 (UT-13-080)	50%	2/17	A358 GR 304 stainless steel Pipe to A351 CF8M Cast Valve.	E/ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
CRD-2-005-003 (CRD System)	D	4"	2-ISI-0272-C-1 (UT-13-024)	71%	2/17	A333 GR1 carbon steel Pipe to A182 F316 stainless steel Valve (dissimilar metal weld).	ER309L stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-10, for dissimilar metal welds. The procedure is qualified for far side of the weld examination credit when the examination is restricted to one side of the weld. The ultrasonic examination was conducted to the maximum extent practical. Only 71% coverage can be claimed.
RWCU-2-003-070 (RWCU System)	D	6"	2-ISI-0272-C-1 (UT-13-076)	74%	2/17	A403 WP304 stainless steel Sweep-o-let to SA376 TP316 stainless steel Pipe.	ER316/316L stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought pipe to a branch connection configuration that partially restricts the ultrasonic examination. This configuration partially limited the circumferential scan surface for detection of axially oriented flaws on the branch connection side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI phased array procedure, EPRI-PIPE-MPA-1, for similar metal piping welds. The ultrasonic examination was conducted to the maximum extent practical. Only 74% coverage can be claimed.

Table 1 (continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
RWCU-3-001-070 (RWCU System)	A	6"	3-ISI-0332-C-1 (R098)	31%	3/13	A403 WP304 stainless steel Sweep-o-let to A351 CF8M Cast Valve.	ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought piping branch connection to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the branch connection side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 31% coverage can be claimed.
RWCU-3-001-071 (RWCU System)	A	6"	3-ISI-0332-C-1 (R078)	50%	3/13	SA376 TP316NG stainless steel Pipe to A351 CF8M Cast Valve.	ER308L stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
DRHR-3-03 (RHR System)	D	24"	3-ISI-0330-C-1 (UT-12-039)	30%	3/15	A182 F304 Flued Head to A351 CF8M Cast Valve.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought fluted head penetration to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the fluted head side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 30% coverage can be claimed.

Table 1 (continued)

Weld Number (System)	IGSCC Category	Nominal Pipe Size (NPS)	ISI Drawing Number (Weld Report)	Examination Coverage Percent (Nearest %)	Unit / Cycle Inspection Performed	Joint Configuration	Weld Material	Comments
DRHR-3-12 (RHR System)	D	24"	3-ISI-0330-C-1 (UT-12-031)	30%	3/15	A182 F304 Flued Head to A351 CF8M Cast Valve.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a wrought fluted head penetration to a cast valve configuration that restricts the ultrasonic examination on both sides of the weld. This configuration limited the scan surface to only a portion of the fluted head side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 30% coverage can be claimed.
DRHR-3-21 (RHR System)	C	20"	3-ISI-0330-C-1 (R024)	50%	3/14	A403 WP304 stainless steel Elbow to A351 CF8M Cast Valve.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.
GR-3-63 (RECIRC System)	E	28"	3-ISI-0328-C-2 (UT-12-027)	50%	3/15	A358 TP 304 stainless steel Pipe to A351 CF8 Cast steel Valve.	ER308 stainless steel.	Examination coverage limitations are due to the physical configuration of a cast valve that restricts the ultrasonic examination to one side of the weld. Examinations were conducted in accordance with an ASME Section XI, Appendix VIII qualified generic PDI procedure, PDI-UT-2, for austenitic metal welds. The qualified procedure requires examination techniques be applied that are intended to interrogate the far side of the weld. However, the generic ultrasonic procedure (or any other existing procedure) is not qualified for detection of flaws on the far side of the weld in austenitic material. Therefore, no examination credit was applied for the far side of the weld that was inaccessible. The ultrasonic examination was conducted to the maximum extent practical. Only 50% coverage can be claimed.

BFN Units 1, 2, and 3
Request for Relief ISI-44

Enclosure
Attachment A

Inservice Inspection Drawings

1-CHM-1081-C-1
1-CHM-1081-C-2
1-CHM-1088-C-1
1-CHM-1098-C-1
1-CHM-1098-C-2
1-ISI-0362-C-8
2-ISI-0221-C-1
2-ISI-0270-C-2
2-ISI-0272-C-1
3-ISI-0328-C-2
3-ISI-0330-C-1
3-ISI-0332-C-1

A - LOOP

RWR-1-001-006
RWR-1-W001-071
N1A 0°
RWR-1-001-005
RWR-1-W001-066
RWR-1-001-044
N2K 330°
N2J 300°
RWR-1-W001-067
RWR-1-001-045
N2H 270°
RWR-1-W001-068
RWR-1-001-046
N2G 240°
RWR-1-W001-069
RWR-1-001-053
N2F 210°
RWR-1-W001-070
RWR-1-001-052
RWR-1-001-051
RWR-1-001-049
RWR-1-001-043
RWR-1-001-047
RWR-1-001-47A
RWR-1-001-050
RWR-1-001-S048A
RWR-1-001-041
RWR-1-001-048
RWR-1-001-042
RWR-1-001-S040A
RWR-1-001-040
RWR-1-001-030
RHR LOOP A
1-CHM-1088-C
20"
28"
12"
22"
24"
1-CHM-1088-C
EL 579'-3"
RHR

RWR-1-001-004
4" DECONTAMINATION LINE
RWR-1-001-012
RBC-1-1
& PUMP 1-1A
RWR-1-001-027
RWR-1-001-003
FCV68-01
FCV68-01-BC
RWR-1-001-002
RWR-1-001-S012A
SW-TPR-1-11
1-1/4"
(SEE DETAIL "A")
RWR-1-001-S013A
RWR-1-001-022
1-1/4"
28"
4"
RWR-1-001-025
FCV68-03
FCV68-03-BC
RWR-1-001-024
SW-TPR-1-6
RWR-1-001-023
RWR-1-001-S023A
RWR-1-001-001

K = KELLOGG SHOP WELD
G = GE FIELD WELD
XR-N-N
SYSTEM
UNIT NO.
WELD NO.

REFERENCE DRAWINGS:
1-47E408-5
DCN 51045

R14 120119 105

MATERIAL SPECIFICATIONS:
2" PIPE SA-376 TP316NG
2" FITTING-SA-182 F316NG
4" FITTING-SA-182 F316L (CAP & FLANGE)
4" WELDOLET-SA403 WP 316NG
12" PIPE SA376 TP316NG
22" PIPE SA403 WP 316NG
28" PIPE SA376 TP316NG
28" FITTING-SA403 WP 316NG
VALVES SS CASTINGS A351 CF8
PUMP CASING SS CASTING A351 CF8M

ASME CC-1 (EQUIVALENT)

SHOP WELD
FIELD WELD

NOTE:
RECIRC NOZZLES (INNER RADIUS)
N1A-IR
N2F-IR
N2G-IR
N2H-IR
N2J-IR
N2K-IR

R14 090821 101

RWR-1-001-S014A
28"
RWR-1-001-014
RWR-1-001-015
68-505
RWR-1-001-18
RWR-1-001-19
68-506
RWR-1-001-17
RWR-1-001-16

DETAIL "A"

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
003	ADMIN	K KING	B Campbell	DP Walker	7-30-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133) AND R14 090821 101					

TENNESSEE VALLEY AUTHORITY

SYSTEM NO. 068

BROWNS FERRY NUCLEAR PLANT
UNIT 1
RECIRCULATION SYSTEM
WELD LOCATIONS

DRAWN:	SUBMITTED	APPROVED	SCALE NTS
DATE:	DATE:	DATE:	SHEET 1 OF 2 SHEET(S)
CHECKED:			DRAWING NO. 1-CHM-1081-C REV 003
DATE:			

CAD MAINTAINED DRAWING

CCD

ALL A/D HISTORY RESEARCHED AT R000

B - LOOP

RWR-1-002-061
RWR-1-W002-031
N1B 180°
RWR-1-002-058
N2E 150°
RWR-1-W002-030
RWR-1-002-040
N2D 120°
RWR-1-W002-029
RWR-1-002-039
N2C 90°
RWR-1-W002-028
RWR-1-002-038
N2B 60°
RWR-1-W002-027
RWR-1-002-037
N2A 30°
RWR-1-W002-026
RWR-1-002-036
12"
RWR-1-002-035
12"
RWR-1-002-041
12"
12"
RWR-1-002-043
RWR-1-002-045
RWR-1-002-033
RWR-1-002-034
RWR-1-002-S034A
22"
22"
28"
RWR-1-002-042
RWR-1-002-S042A
RWR-1-002-044
RWR-1-002-032
RWR-1-002-017
1-CHM-1088-C
LOOP B 24"RHR
EL 577'-2"
RWR-1-002-056
RBC-1-2
4"
DECONTAMINATION
LINE
RWR-1-002-050
RWR-1-002-015
℄ PUMP
1-1B
RWR-1-002-055
FCV68-77
FCV68-77-BC
RWR-1-002-053
RWR-1-002-011
1-1/4"
28"
4"
RWR-1-002-013
FCV68-79
FCV68-79-BC
RWR-1-002-012
RWR-1-002-S050A
SW-TPR-1-17
1-1/4"
SW-TPR-1-12
RWR-1-002-011A
RWR-1-002-S011B
(SEE DETAIL "A")
RWR-1-002-S048A
RWR-1-002-048

REFERENCE DRAWINGS:
1-47E403-6
DCN 51045

MATERIAL SPECIFICATIONS:
2" PIPE SA376 TP316NG
2" FITTING, SA182 F316NG
4" FITTING SA182 F316L (CAP & FLANGE)
4" WELDOLET-SA-403 WP316NG
12" PIPE-SA376 TP316NG
22" PIPE SA-403 WP 316NG
28" PIPE SA-376 TP316NG
28" FITTING-SA403 WP316NG
VALVES SS CASTINGS A351 CF8
PUMP CASING SS CASTING A351 CF8M

R14 120119 105

ASME CC-1 (EQUIVALENT)

SHOP WELD
FIELD WELD

NOTE:
RECIRC NOZZLES (INNER RADIUS)
N1B-IR
N2A-IR
N2B-IR
N2C-IR
N2D-IR
N2E-IR

R14 090821 101

RWR-1-002-062A
28"
RWR-1-002-062
RWR-1-002-063
2"
68-520
RWR-1-002-66
RWR-1-002-067
68-521
RWR-1-002-65
RWR-1-002-064

DETAIL "A"

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
002	ADMIN	K KING	B Campbell	DP Hollker	7-30-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133) AND R14 090821 101					

TENNESSEE VALLEY AUTHORITY

SYSTEM NO. 068

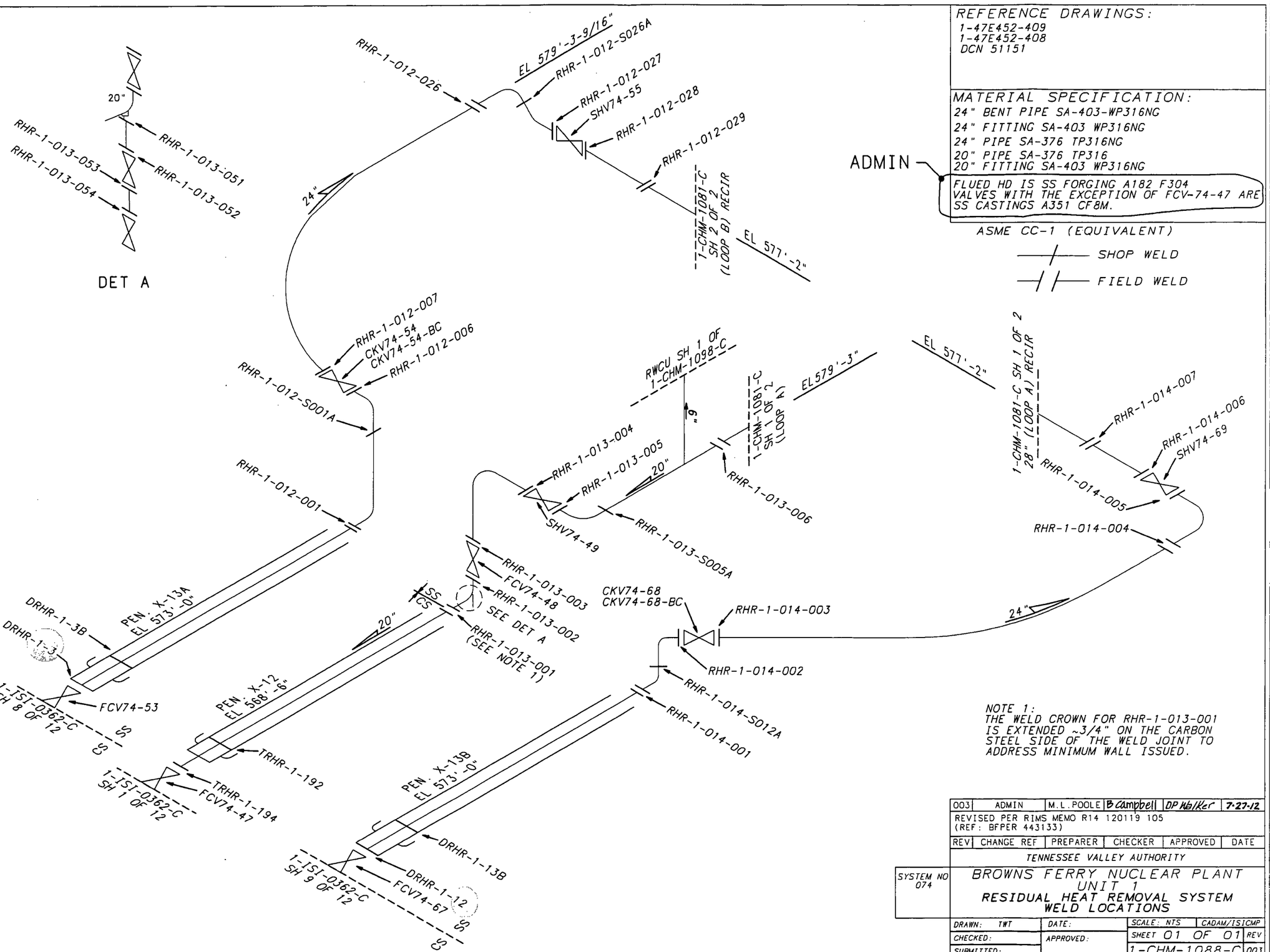
BROWNS FERRY NUCLEAR PLANT
UNIT 1
RECIRCULATION SYSTEM
WELD LOCATIONS

DRAWN: TWT	SUBMITTED	APPROVED	SCALE NTS
DATE:	DATE:	DATE	SHEET 2 OF 2 SHEET(S)
CHECKED:			DRAWING NO. 1-CHM-1081-C REV. 002
DATE:			

CAD MAINTAINED DRAWING

CCD

ALL A/D HISTORY RESEARCHED AT ROOO



NOTE 1:
THE WELD CROWN FOR RHR-1-013-001 IS EXTENDED ~3/4" ON THE CARBON STEEL SIDE OF THE WELD JOINT TO ADDRESS MINIMUM WALL ISSUED.

003	ADMIN	M.L. POOLE	B Campbell	DP Walker	7-27-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE

TENNESSEE VALLEY AUTHORITY

SYSTEM NO 074

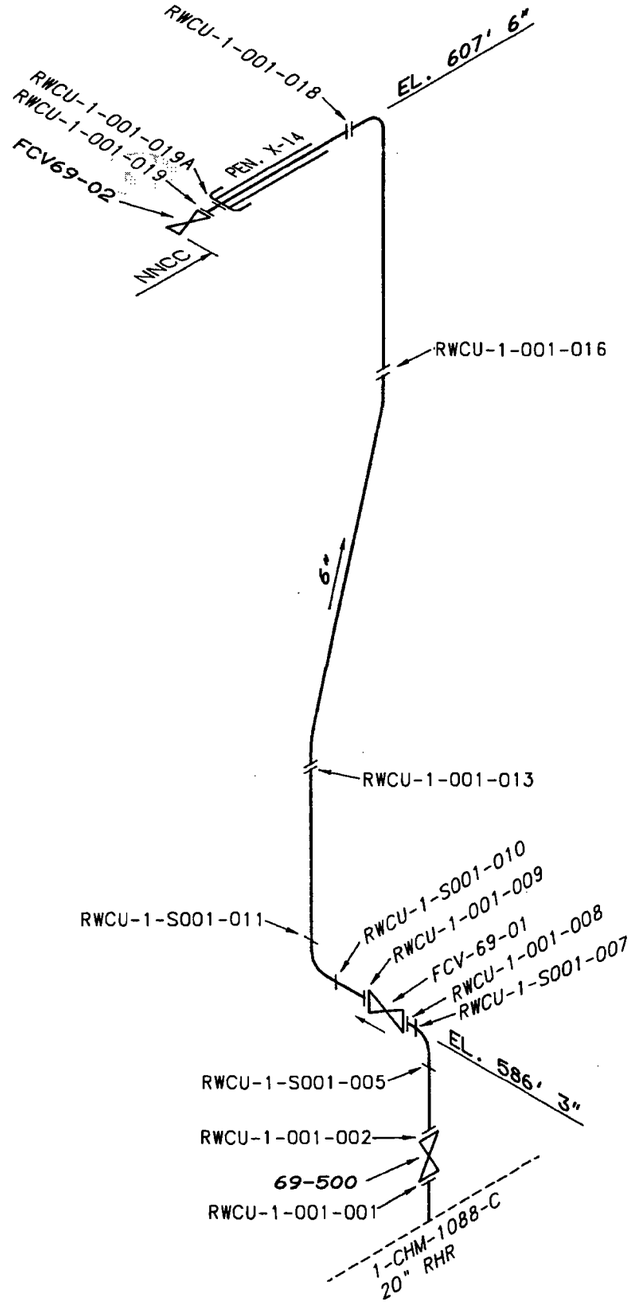
BROWNS FERRY NUCLEAR PLANT UNIT 1
RESIDUAL HEAT REMOVAL SYSTEM WELD LOCATIONS

DRAWN: TWT	DATE:	SCALE: NTS	CADAM/IS	CMP
CHECKED:	APPROVED:	SHEET 01 OF 01		REV
SUBMITTED:		1-CHM-1088-C		003

CAD MAINTAINED DRAWING

CCD

ALL A/D HISTORY RESEARCHED AT ROOO



REFERENCE DRAWINGS

RWCU-1-001 (TVA WELD MAP)
DCN 51046
1-47E406-7, -8
1-47BM406-60

MATERIAL SPECIFICATIONS

FITTINGS 6" SA403 WP316NG SCH 80

PIPING 6" SA376 TP316NG SCH 80
BENT PIPING 6" SA403 WP316NG SCH 80

VALVE 6" SA-351 CF8M

ASME CC-1 (EQUIVALENT)

—/— SHOP WELDS

—//— FIELD WELDS

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
000	ADMIN	W. TRIVETT	[signature]	R Douglas	4-14-05

ISSUED TO CREATE CCD PER RIMS MEMO W78 050218 006; SUPERSEDES AS DESIGNED CHM-1098-C-1 R8 (ADMINISTRATIVE REVISION)

TENNESSEE VALLEY AUTHORITY

SYSTEM NO. 069

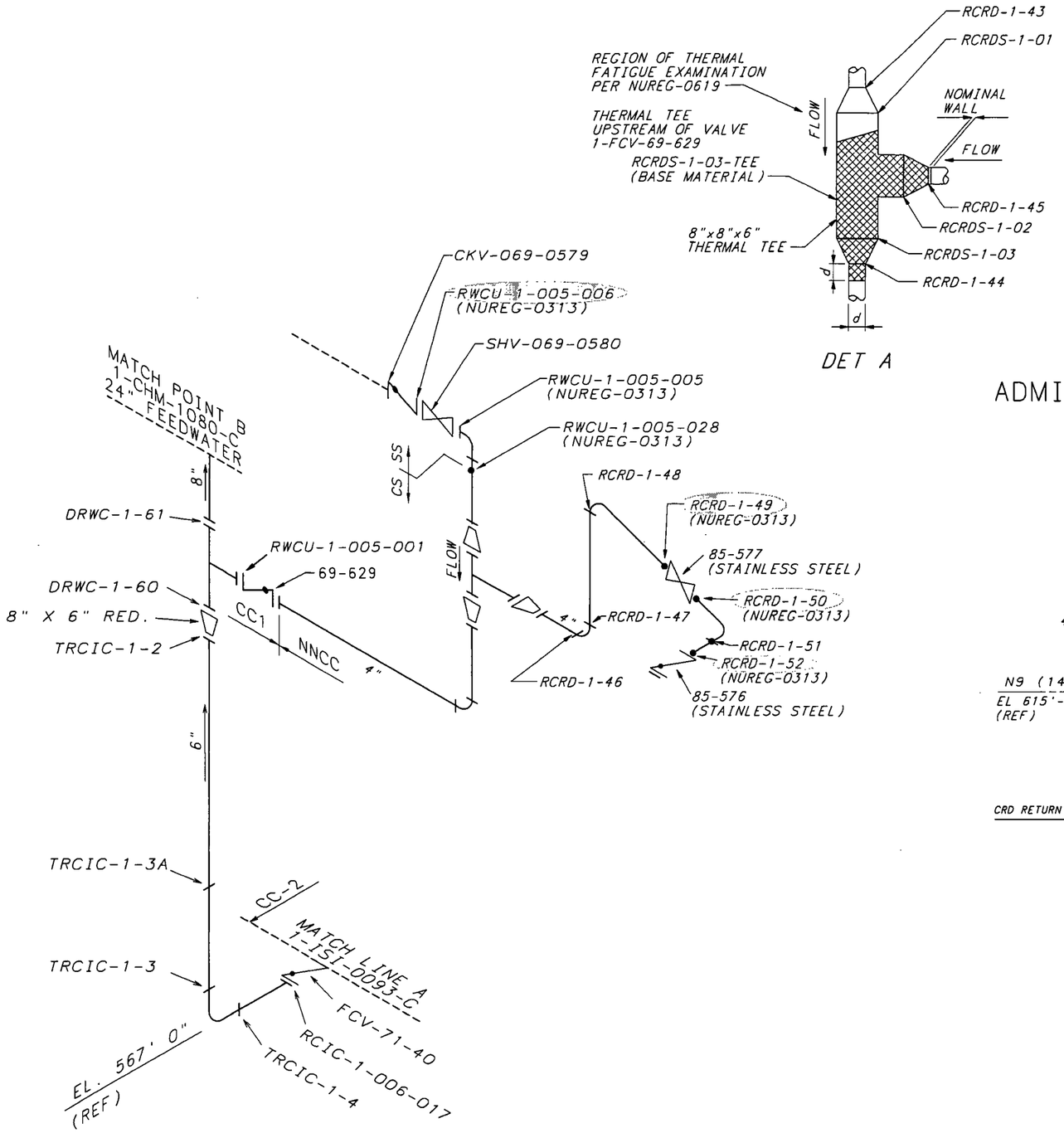
BROWNS FERRY NUCLEAR PLANT
UNIT 1
REACTOR WATER CLEAN UP, RCIC, AND CRD
WELD IDENTIFICATION

DRAWN: TWT	DATE:	SCALE: NTS	CADAM/ISICMP
CHECKED:	APPROVED:	SHEET 01 OF 02	REV
SUBMITTED:		1-CHM-1098-C	000

CCD

ALL A/D HISTORY RESEARCHED AT R000

CAD MAINTAINED DRAWING



REFERENCE DRAWINGS
TVA 47W335-14
TVA 47W335-17
DRAVO E-2460-IC-4

NOTE:
THIS DRAWING SUPERSEDES CHM-1097-C

MATERIAL SPECIFICATIONS

4" X 0.337" NOM. WALL - CS
SCH. 80 A-333, GR1 (SEAMLESS)

6" X 0.562 NOM. WALL - CS, SCH. 120

8" X 0.593 NOM. WALL - CS, SCH. 100

CRD CAP 4" X 0.674" NOM. WALL SS

4" VALVE 69-629 SA-216 WCB

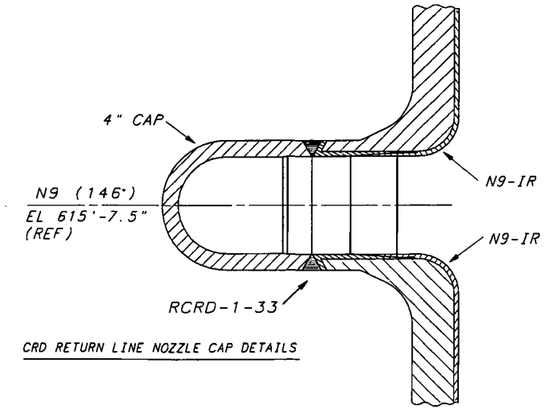
VALVE SHV-69-580, SS CASTING A351 CF8M

VALVES CKV-69-579, 85-576, & 85-577
SS FORGINGS A182 F316

NOTE: ALL FIELD WELDS WERE MADE BY TVA

ADMIN

ASME CC-1 (EQUIVALENT)



CRD RETURN LINE NOZZLE CAP DETAILS

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
003	ADMIN	K KING	B Campbell	DP Walker	7-30-12

REVISED PER RIMS MEMO R14 120119 105. (REF: BFPER 443133)

TENNESSEE VALLEY AUTHORITY

SYS NO. 69,71

BROWNS FERRY NUCLEAR PLANT
UNIT 1
REACTOR WATER CLEAN UP, RCIC, AND CRD
WELD IDENTIFICATION

DRAWN: PHB	DATE: 1-4-93	SCALE: NTS	CADAM/ISICMP
CHECKED: RPG	APPROVED:	SHEET 02 OF 02	REV
SUBMITTED: JES	GLB	1-CHM-1098-C	003

ALL A/D HISTORY RESEARCHED AT R000

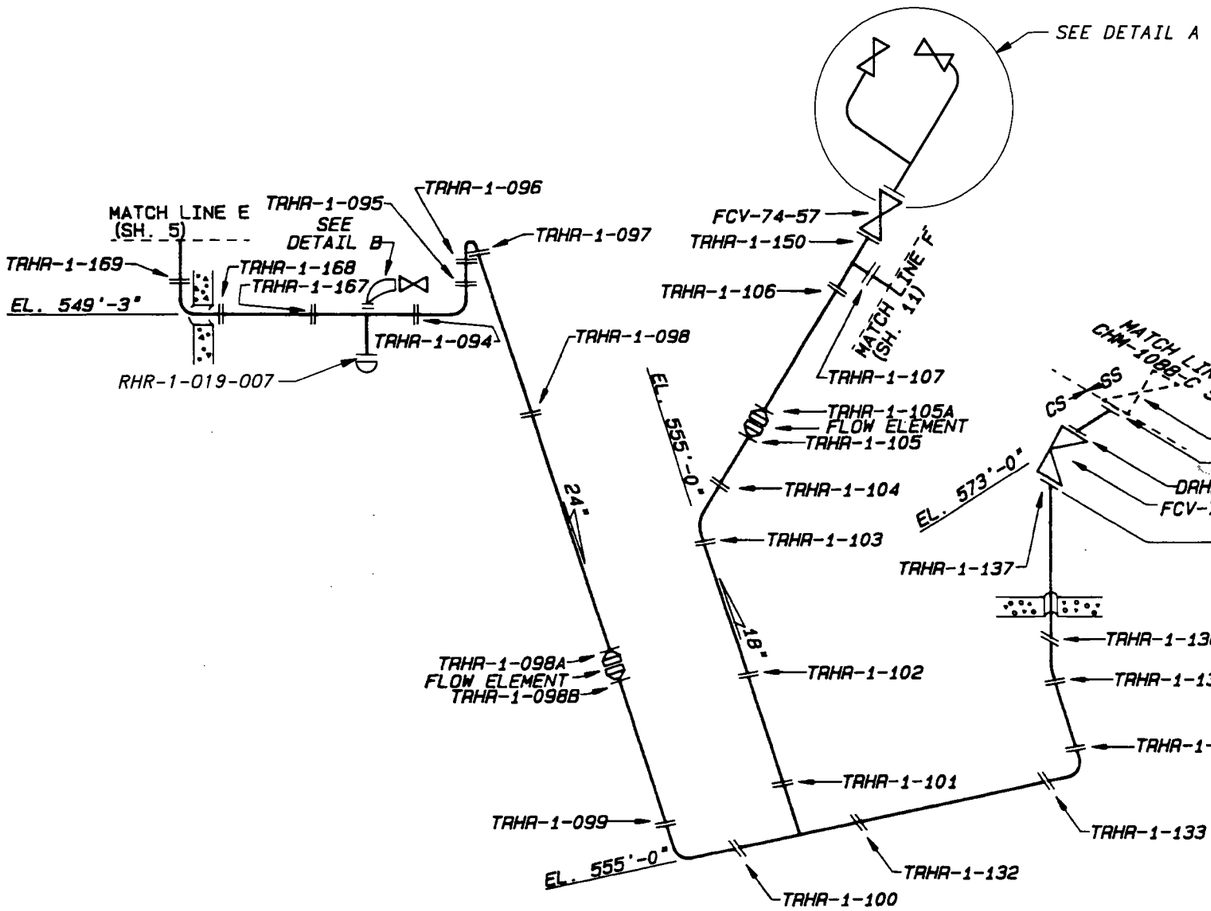
CAD MAINTAINED DRAWING

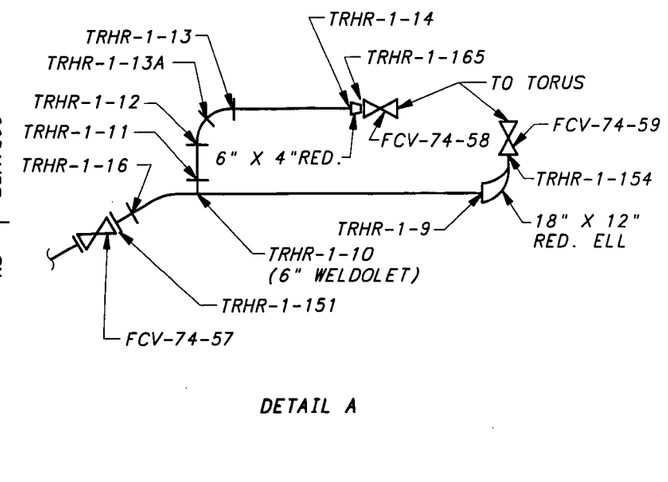
CCD

REFERENCE DRAWINGS
47W452 SERIES
47W335-6
NOTE: ISI-0362-C SH. 8 & 9 SUPERSEDE CHM-2676-C SH. 4

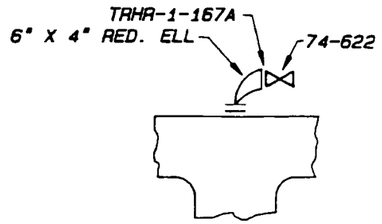
MATERIAL SPECIFICATIONS
24" x 1.531" NOM. WALL (SCH. 100), CS
24" x .500" NOM. WALL (XS), CS
18" x .500" NOM. WALL (XS), CS
6" x .280" NOM. WALL (SCH. 40), CS

ADMIN — VALVE FCV-74-53, SS CASTING, A351 CF8M
ASME CC-2 (EQUIVALENT)

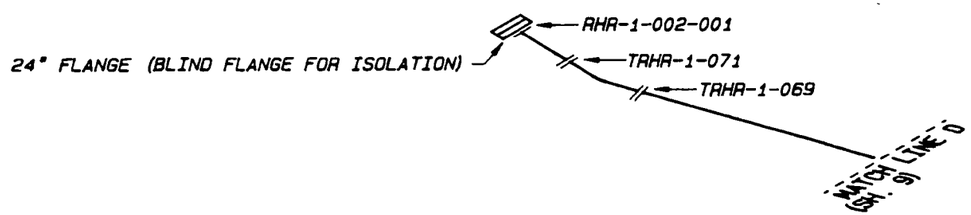




DETAIL A



DETAIL B



ALL A/D HISTORY RESEARCHED AT ROOO

001	ADMIN	M.L. POOLE	B Campbell	DP Walker	7-27-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					
REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT
UNIT 1
RESIDUAL HEAT REMOVAL SHUTDOWN SUPPLY
WELD LOCATIONS

DRAWN: PHB	SUBMITTED	APPROVED	SCALE: NTS
DATE: 11-2-89	DATE: 1-11-90	DATE: 1-11-90	SHEET 8 OF 12 SHEET (S)
CHECKED: JES	EDC	GLB	DRAWING NO. 1-ISI-0362-C REV 001
DATE: 1-11-90			

CAD MAINTAINED DRAWING

CCD

NOTE:

1. PIPE SEGMENTS CONTAINING TWO LONGITUDINAL SEAMS WILL BE IDENTIFIED AS:

   (BASE WELD NO.)-LS-1D (DOWNSTREAM)
   (BASE WELD NO.)-LS-2D (DOWNSTREAM)
   (BASE WELD NO.)-LS-1U (UPSTREAM)
   (BASE WELD NO.)-LS-2U (UPSTREAM)

   THE -LS-1 SEAM WILL BE NUMERICALLY CLOSEST TO 0° ON THE PIPE, AND THE -LS-2 SEAM WILL BE NUMERICALLY FARTHERMOST FROM 0° ON THE PIPE. (e.g. -LS-1 AT 130°, AND -LS-2 AT 310°)

2. PIPE SEGMENTS CONTAINING ONLY ONE LONGITUDINAL SEAM WILL BE IDENTIFIED AS:

   (BASE WELD NO.)-LS-D (DOWNSTREAM)
   (BASE WELD NO.)-LS-U (UPSTREAM)

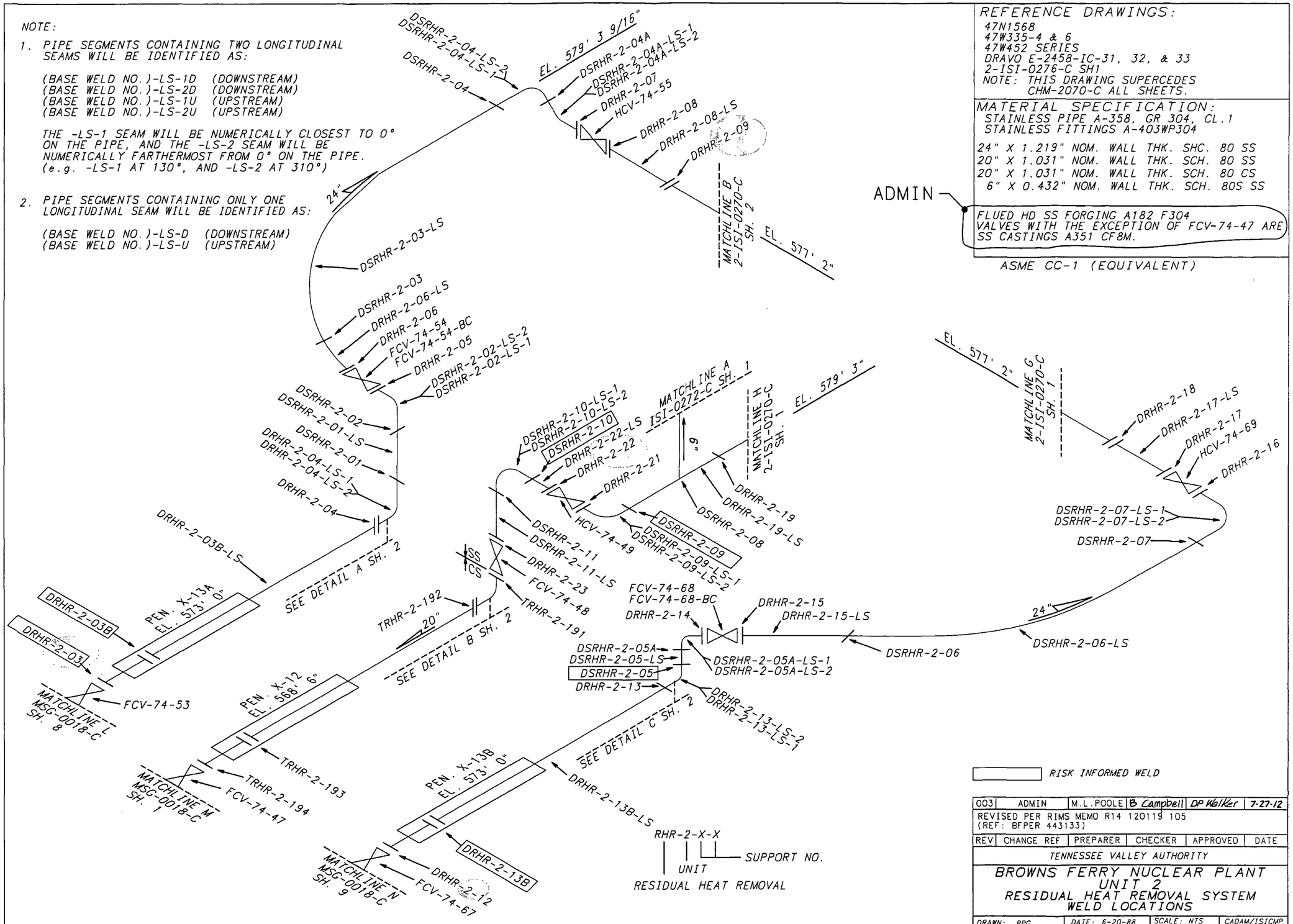
REFERENCE DRAWINGS:
47N1568
47W335-4 & 6
47W452 SERIES
DRAVO E-2458-IC-31, 32, & 33
2-ISI-0276-C SH1
NOTE: THIS DRAWING SUPERCEDES CHM-2070-C ALL SHEETS.

MATERIAL SPECIFICATION:
STAINLESS PIPE A-358, GR 304, CL.1
STAINLESS FITTINGS A-403WP304

24" X 1.219" NOM. WALL THK. SHC. 80 SS
20" X 1.031" NOM. WALL THK. SCH. 80 SS
20" X 1.031" NOM. WALL THK. SCH. 80 CS
6" X 0.432" NOM. WALL THK. SCH. 80S SS

ADMIN — FLUED HD SS FORGING A182 F304
VALVES WITH THE EXCEPTION OF FCV-74-47 ARE SS CASTINGS A351 CF8M.

ASME CC-1 (EQUIVALENT)



RISK INFORMED WELD

003	ADMIN	M.L.POOLE	B Campbell	DP Walker	7-27-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					
REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE

TENNESSEE VALLEY AUTHORITY

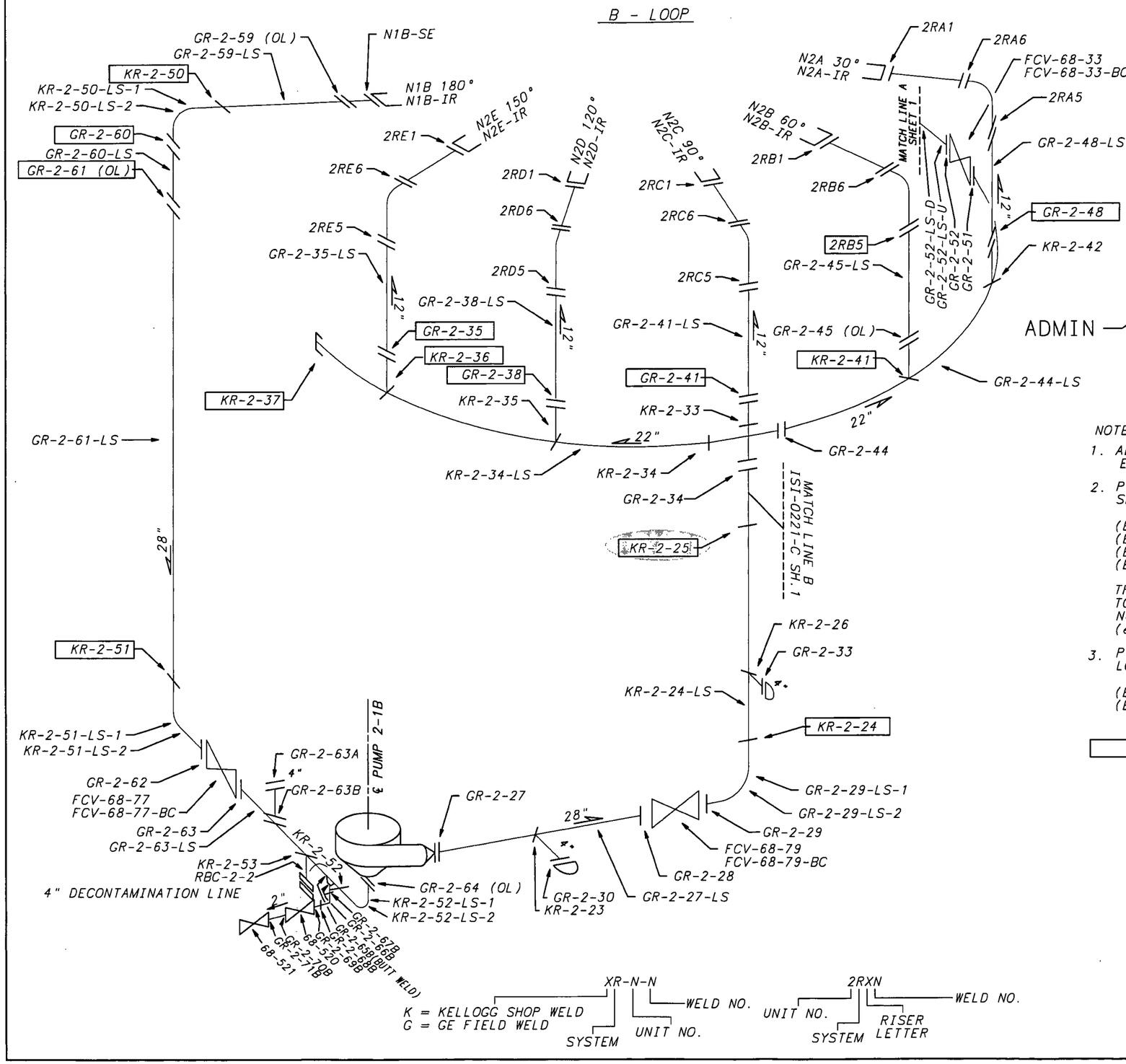
BROWNS FERRY NUCLEAR PLANT UNIT 2
RESIDUAL HEAT REMOVAL SYSTEM WELD LOCATIONS

DRAWN: RPG	DATE: 6-20-88	SCALE: NTS	CADAM/ISICMP
CHECKED: JES	APPROVED: GLB	SHEET 01 OF 02	REV
SUBMITTED: EDC		2-ISI-0221-C	003

ALL A/D HISTORY RESEARCHED AT ROOO

CAD MAINTAINED DRAWING

CCD



REFERENCE DRAWINGS:

2-47W2408-8,9 (S.E. REPLACEMENT)
GE 769E963 (S.E. REPLACEMENT)
TVA 47K1544-2
GE 2-153F754
KELLOGG BF 2-180
NOTE: THIS DRAWING SUPERSEDES CHM-2068-C ALL SHEETS

MATERIAL SPECIFICATIONS:

A358, TP 304
4" X 0.337" NOM WALL THK. (SS)
12" X 0.569" NOM. WALL THK. (SS)
22" X 1.030" NOM. WALL THK. (SS)
28" X 1.138" NOM. WALL THK. (SS) SUCTION
28" X 1.322" NOM. WALL THK. (SS) DISCHARGE

2" SCH. 80, A376, TP304
2" FITTINGS A182,F304

SAFE END REPLACEMENT
12" X 0.688 NOM. WALL THK. (SS)
SA 403 WP 316 N.G.

VALVES SS CASTINGS A351 CF8
PUMP CASING SS CASTING A351 CF8M

ASME CC-1 (EQUIVALENT)

NOTES:

1. ALL 2" WELDS ARE SOCKET WELDED EXCEPT WHERE NOTED.
2. PIPE SEGMENTS CONTAINING TWO LONGITUDINAL SEAMS WILL BE IDENTIFIED AS:

   (BASE WELD NO.)-LS-1D (DOWNSTREAM)
   (BASE WELD NO.)-LS-2D (DOWNSTREAM)
   (BASE WELD NO.)-LS-1U (UPSTREAM)
   (BASE WELD NO.)-LS-2U (UPSTREAM)

   THE -LS-1 SEAM WILL BE NUMERICALLY CLOSEST TO 0° ON THE PIPE, AND THE -LS-2 SEAM WILL BE NUMERICALLY FARTHERMOST FROM 0° ON THE PIPE. (e.g. -LS-1 AT 130°, AND -LS-2 AT 310°)
3. PIPE SEGMENTS CONTAINING ONLY ONE LONGITUDINAL SEAM WILL BE IDENTIFIED AS

   (BASE WELD NO.)-LS-D (DOWNSTREAM)
   (BASE WELD NO.)-LS-U (UPSTREAM)

[ ] RISK INFORMED WELDS

ALL A/D HISTORY RESEARCHED AT ROOO

006	ADMIN	M.L.POOLE	B Campbell	DP Walker	7-30-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					
REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE

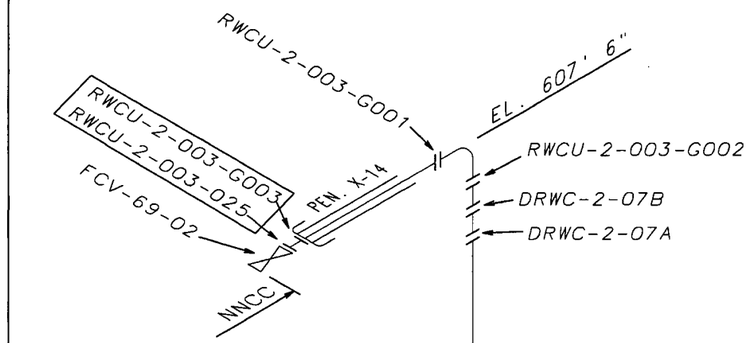
TENNESSEE VALLEY AUTHORITY

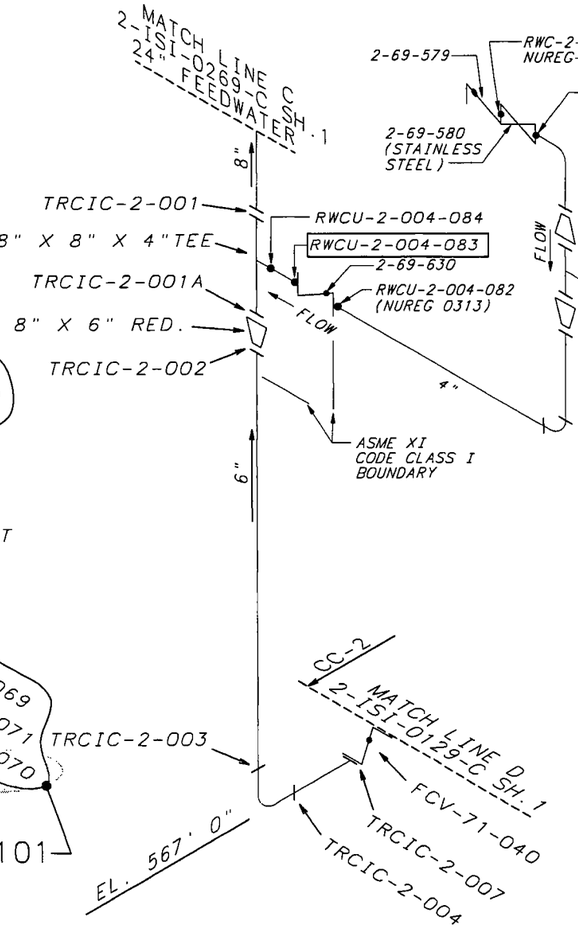
BROWNS FERRY NUCLEAR PLANT
UNIT 2
RECIRCULATION SYSTEM
WELD LOCATIONS

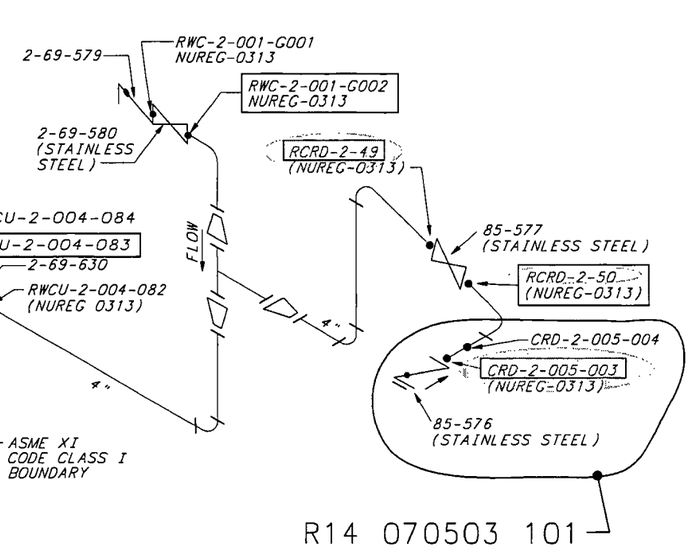
DRAWN: PHB	SUBMITTED	APPROVED	SCALE NTS
DATE: 3-28-89	DATE 5-8-89	DATE 5-17-89	SHEET 2 OF 2 SHEET(S)
CHECKED: JES	EDC	GLB	DRAWING NO. 2-ISI-0270-C
DATE: 5-3-89			REV. 006

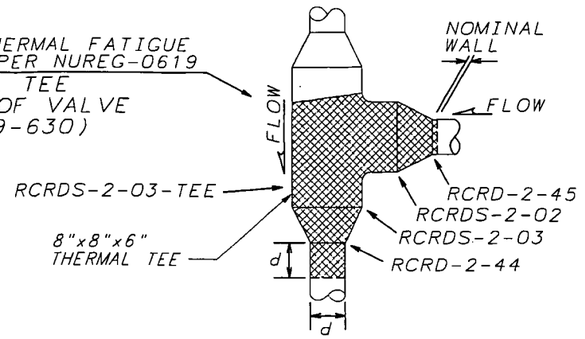
CAD MAINTAINED DRAWING

CCD









REFERENCE DRAWINGS
CRD-2-005
RCIC-2-004
RWC-2-001
47W335-14, -17

NOTE:
THIS DRAWING SUPERSEDES CHM-2075-C AND CHM-2072-C (ALL SHEETS)

MATERIAL SPECIFICATIONS

STAINLESS STEEL
FITTINGS
6" SA403 WP316NG SCH. 80 SS
PIPING
6" SA376 TP316NG SCH. 80 SS
6" A376GR TP304 SCH. 80 SS
6" A312GR TP304 SCH. 80 SS

CARBON STEEL
4" SCH. 80 A-333, GR1 (SEAMLESS) CS
6" X 0.562" NOM WALL SCH. 120 CS
8" X 0.593" NOM WALL SCH. 100 CS

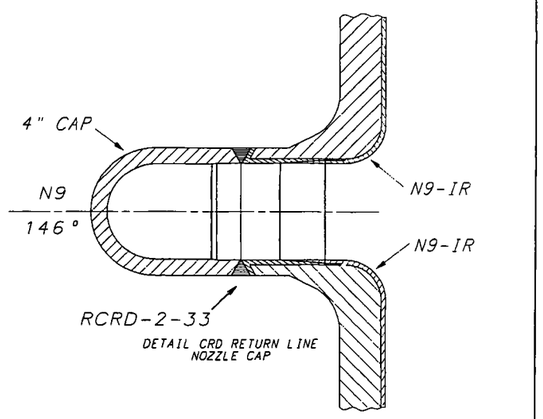
R14 120119 105

VALVES
2-69-630 SA351 CF8M SS
2-69-580 A351 CF8M SS
2-FCV-69-01 A351 CF8M SS
2-FCV-69-02 A351 CF8M SS
2-85-577 A182 F316 SS
2-85-576 A182 F316 SS
2-69-579 A182 F316 SS

CRD CAP
4" X 0.674" NOM WALL SS

ASME CC-1 (EQUIVALENT)

RISK INFORMED WELD



REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
010	ADMIN	B CAMPBELL	J.McFarland	DP Walker	05/22/12

REVISED PER RIMS MEMOS R14 070503 101 AND R14 120119 105 (REF: BFPER 443133)

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT UNIT 2
REACTOR WATER CLEAN UP, RCIC, AND CRD WELD IDENTIFICATION

DRAWN: PHB	DATE: 6-9-88	SCALE: NTS	CADAM/ISICMP
CHECKED: JES	APPROVED: GLB	SHEET 01 OF 03	REV
SUBMITTED: EDC		2-ISI-0272-C	010

CCD

CAD MAINTAINED DRAWING

ALL A/D HISTORY RESEARCHED AT R000

B - LOOP

GR-3-59 (OL)
GR-3-59-LS
KR-3-50
KR-3-50-LS-1
KR-3-50-LS-2
GR-3-60 (OL)
GR-3-60-LS
GR-3-61
N1B-SE
N1B 180°
N1B-IR
RWR-3-002-G013
RWR-3-002-G015
N2E 150°
N2E-IR
N2D 120°
N2D-IR
RWR-3-002-G010
RWR-3-002-G012
N2C 90°
N2C-IR
RWR-3-002-G007
RWR-3-002-G009
RWR-3-002-G001
RWR-3-002-G003
N2A 30°
N2A-IR
N2B 60°
N2B-IR
RWR-3-002-G004
RWR-3-002-G006
ADMIN
RWR-3-002-G016
12"
RWR-3-002-G024
RWR-3-002-G022
RWR-3-002-G020
RWR-3-002-G018
RWR-3-002-G017
22"
BENT INTEGRAL TEE
W/12"X22" RED.(2 TYP.)
SEE DETAIL A
GR-3-61-LS
RWR-3-002-G023
RWR-3-002-G021
RWR-3-002-G019
28" X 22" CROSS
W/22" X 12" RED.
SEE DETAIL B
SW-TPR-3-21
MATCH LINE B
ISI-0330-C SH.1
RWR-3-002-G025
28"
KR-3-51
KR-3-51-LS-1
KR-3-51-LS-2
GR-3-62
FCV68-77
FCV68-77-BC
GR-3-63
GR-3-63-LS
GR-3-63A
4"
GR-3-63B
℄ PUMP 3-1B
KR-3-53
4"
4" DECONTAMINATION LINE
RBC-3-2
KR-3-52
KR-3-52-LS-1
KR-3-52-LS-2
GR-3-64 (OL)
GR-3-27 (OL)
28"
KR-3-23
GR-3-30
GR-3-27-LS
GR-3-28
FCV68-79
FCV68-79-BC
GR-3-29
GR-3-29-LS-1
GR-3-29-LS-2
KR-3-24
KR-3-24-LS
KR-3-26
GR-3-33

K = KELLOGG SHOP WELD
G = GE FIELD WELD
XR-N-N
SYSTEM
UNIT NO.
WELD NO.

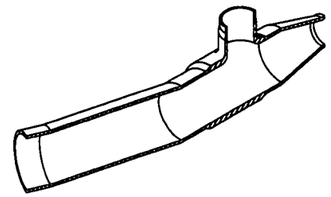
REFERENCE DRAWINGS:
TVA 47K1544-3
GE 153F754
KELLOGG BF 2-180
NOTE: THIS DRAWING SUPERSEDES CHM-2139-C ALL SHEETS

MATERIAL SPECIFICATIONS:
A358, TP 304
4" X 0.337" NOM WALL THK. (SS)
28" X 1.138" NOM. WALL THK. (SS) SUCTION
28" X 1.322" NOM. WALL THK. (SS) DISCHARGE

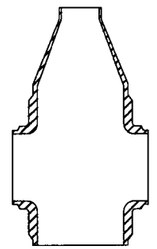
SA403 WP316NG
12" X 0.602" MIN. WALL
22" INTEGRAL RED. TEE 0.980" MIN. WALL
28" X 22" CROSS 0.980" MIN. WALL
28" X 24" INEGRAL TEE X 1.272" MIN. WALL

VALVES SS CASTINGS A351 CF8
PUMP CASING SS CASTING A351 CF8M

ASME CC-1 (EQUIVALENT)



DETAIL A - ONE PIECE SPECIAL FORGING



DETAIL B - ONE PIECE SPECIAL FORGING

SYMBOL :
RISK-INFORMED WELD

002	ADMIN	M.L. POOLE	B Campbell	DP Walker	7-30-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					
REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT
UNIT 3
RECIRCULATION SYSTEM
WELD LOCATIONS

DRAWN: PHB	SUBMITTED	APPROVED	SCALE NTS
DATE: 4-4-89	DATE 5-8-89	DATE 5-17-89	SHEET 2 OF 2 SHEET(S)
CHECKED: JES	EDC	GLB	DRAWING NO. 3-ISI-0328-C
DATE: 5-8-89			REV. 002

CAD MAINTAINED DRAWING

CCD

ALL A/D HISTORY RESEARCHED AT R000

NOTE:

1. PIPE SEGMENTS CONTAINING TWO LONGITUDINAL SEAMS WILL BE IDENTIFIED AS:

   (BASE WELD NO.)-LS-1D (DOWNSTREAM)
   (BASE WELD NO.)-LS-2D (DOWNSTREAM)
   (BASE WELD NO.)-LS-1U (UPSTREAM)
   (BASE WELD NO.)-LS-2U (UPSTREAM)

   THE -LS-1 SEAM WILL BE NUMERICALLY CLOSEST TO 0° ON THE PIPE, AND THE -LS-2 SEAM WILL BE NUMERICALLY FARTHERMOST FROM 0° ON THE PIPE. (e.g. -LS-1 AT 130°, AND -LS-2 AT 310°)

2. PIPE SEGMENTS CONTAINING ONLY ONE LONGITUDINAL SEAM WILL BE IDENTIFIED AS

   (BASE WELD NO.)-LS-D (DOWNSTREAM)
   (BASE WELD NO.)-LS-U (UPSTREAM)

REFERENCE DRAWINGS:
47N1568
47W335-4 & 6
47W452 SERIES
DRAVO E-2460-IC-31, 32, & 33

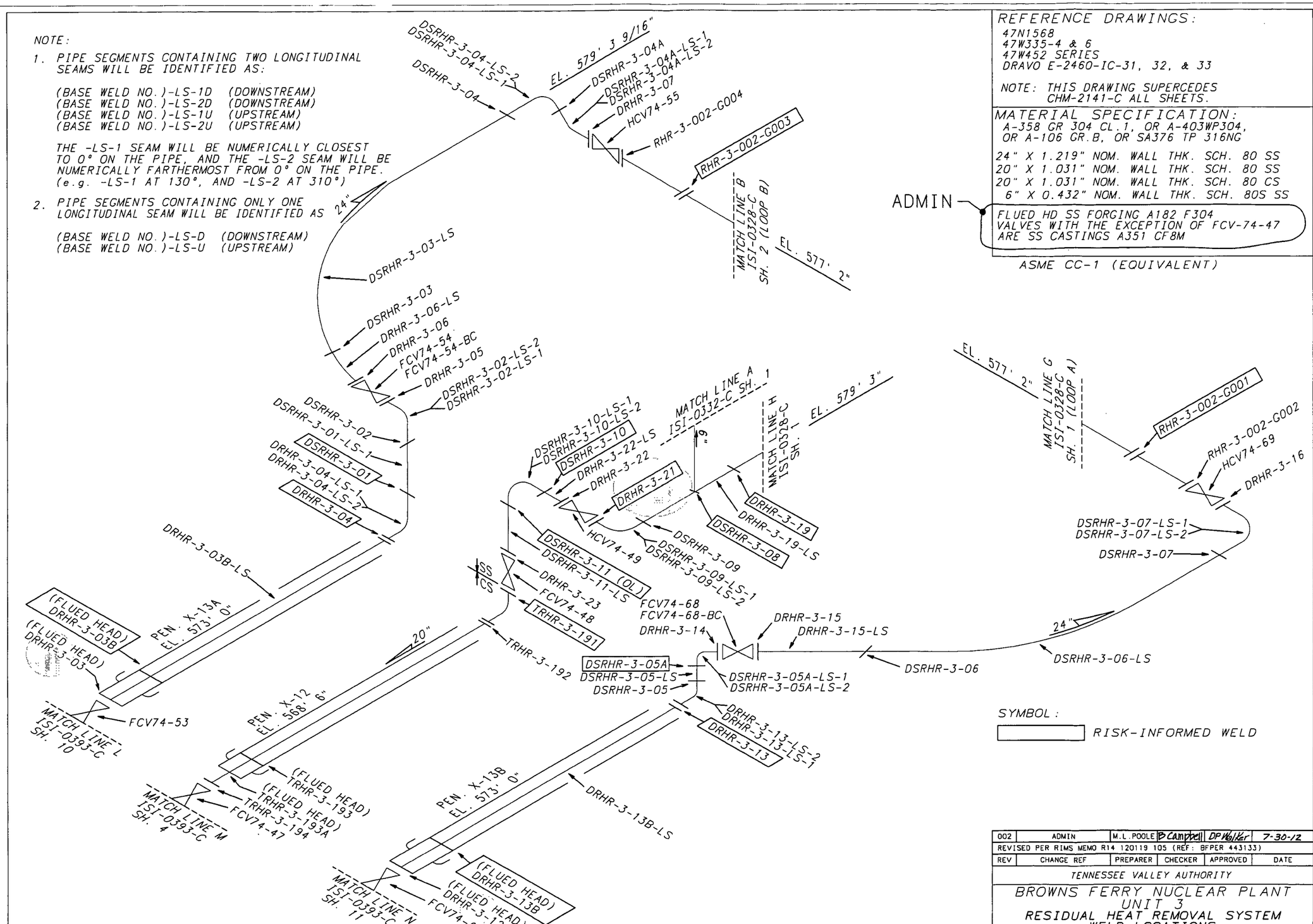
NOTE: THIS DRAWING SUPERCEDES CHM-2141-C ALL SHEETS.

MATERIAL SPECIFICATION:
A-358 GR 304 CL.1, OR A-403WP304, OR A-106 GR.B, OR SA376 TP 316NG

24" X 1.219" NOM. WALL THK. SCH. 80 SS
20" X 1.031" NOM. WALL THK. SCH. 80 SS
20" X 1.031" NOM. WALL THK. SCH. 80 CS
6" X 0.432" NOM. WALL THK. SCH. 80S SS

ADMIN — FLUED HD SS FORGING A182 F304
VALVES WITH THE EXCEPTION OF FCV-74-47 ARE SS CASTINGS A351 CF8M

ASME CC-1 (EQUIVALENT)



SYMBOL :
[ ] RISK-INFORMED WELD

002	ADMIN	M.L. POOLE	B Campbell	DP Walker	7-30-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					
REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE

TENNESSEE VALLEY AUTHORITY

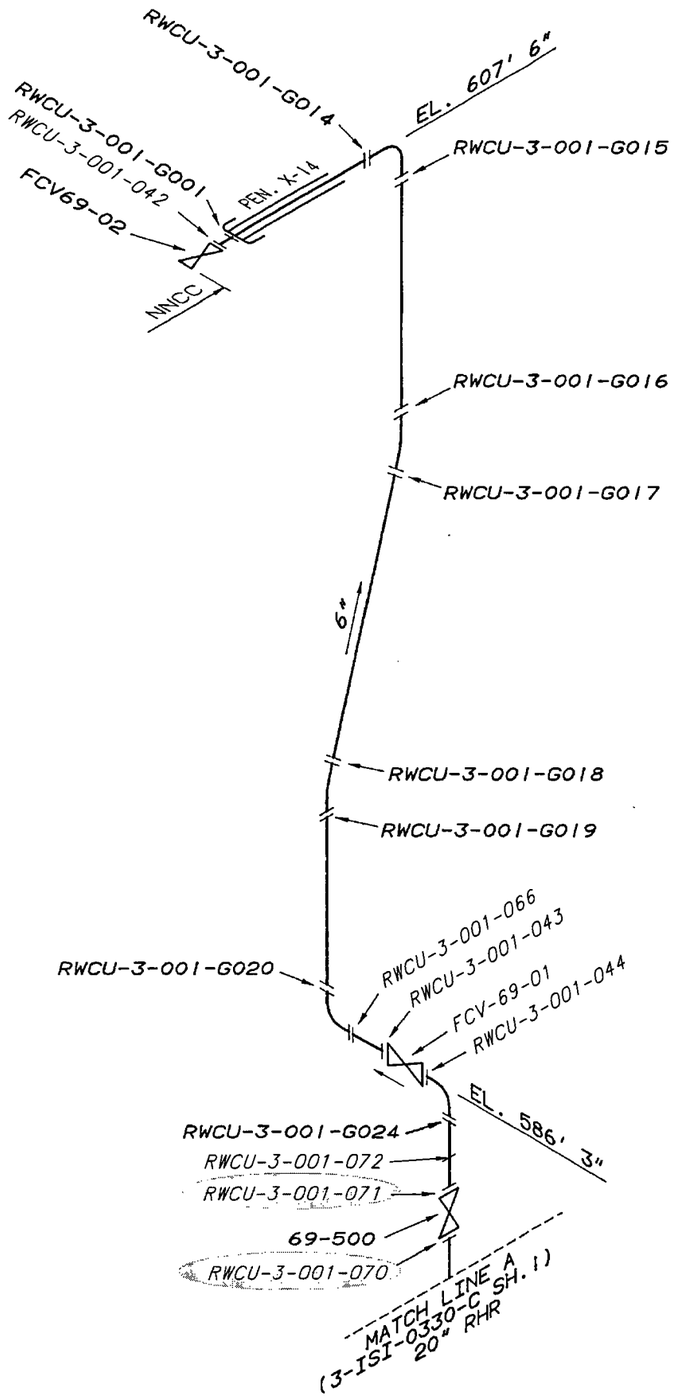
BROWNS FERRY NUCLEAR PLANT UNIT 3
RESIDUAL HEAT REMOVAL SYSTEM WELD LOCATIONS

DRAWN: PHB	DATE: 5-17-89	SCALE: NTS	CADAM/ISICMP
CHECKED: JES	APPROVED: GLB	SHEET 01 OF 01	REV
SUBMITTED: EDC		3-ISI-0330-C	002

CAD MAINTAINED DRAWING

CCD

ALL A/D HISTORY RESEARCHED AT R000



REFERENCE DRAWINGS

RWCU-3-001 (TVA WELD MAP)

NOTE:
THIS DRAWING SUPERSEDES A PORTION OF CHM-2144-C

MATERIAL SPECIFICATIONS

FITTINGS
6" SA403 WP316NG SCH. 80

PIPING
6" SA376 TP316NG SCH. 80

VALVES SS CASTINGS A351 CF8M

ADMIN

ASME CC-1 (EQUIVALENT)

REV	CHANGE REF	PREPARER	CHECKER	APPROVED	DATE
002	ADMIN	M.L. POOLE	B Campbell	DP Walker	7-30-12
REVISED PER RIMS MEMO R14 120119 105 (REF: BFPER 443133)					

TENNESSEE VALLEY AUTHORITY

BROWNS FERRY NUCLEAR PLANT UNIT 3

REACTOR WATER CLEAN UP, RCIC, AND CRD WELD IDENTIFICATION

DRAWN: PHB	DATE: 5-17-89	SCALE: NTS	CADAM/ISICMP
CHECKED: JES	APPROVED: GLB	SHEET 01 OF 02	REV
SUBMITTED: EDC		3-ISI-0332-C	002

CCD

ALL A/D HISTORY RESEARCHED AT R000

CAD MAINTAINED DRAWING

BFN Units 1, 2, and 3
Request for Relief ISI-44

Enclosure
Attachment B

Weld Examination Reports

R024
R078
R098
R237
R253
R254
R257
UT-10-024
UT-10-026
UT-10-028
UT-10-030
UT-12-027
UT-12-031
UT-12-039
UT-12-054
UT-12-055
UT-12-058
UT-12-060
UT-13-004
UT-13-013
UT-13-024
UT-13-044
UT-13-072
UT-13-076
UT-13-079
UT-13-080
UT-13-086

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R024

(2 pages)

000064

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION DATA SHEET	REPORT NUMBER: R024

PROJECT: BFN UNIT: 3			CYCLE: 14	COMPONENT ID: DRHR-3-21		
EXAMINATION METHOD				SYSTEM: RHR	ISI DWG. NO. 3-ISI-0330-C-01	
MT ☐	PT ☐	UT ☒	VT ☐	CODE CLASS: 1		CATEGORY: R-A
PROCEDURE: N-UT- 64		REV: 11	TC: N/A	CONFIG.:	Elbow TO Valve	
EXAMINER: Tommy Brown		**EXAMINER:** Kristen Davis		**EXAMINER:** N/A		**EXAMINER:** N/A
LEVEL: III		**LEVEL:** Trn		**LEVEL:**		**LEVEL:**

This report contains the data associated with the manual ultrasonic examination weld DRHR3-21.
The exam was performed to meet the requirements of NU0313, EXREQ B02-02 Category C and ASME Section XI 2001 Edition 2003 Addenda, Category R-A, Item R1.16C.

This exam was performed using equipment, procedures and personnel qualified in accordance with ASME Section XI, Appendix VIII as amended by 10CFR50.55a final rule.
This exam was performed using TVA Nuclear Procedure N-UT-64 Rev. 11 which incorporates PDI-UT 2 Rev C Addenda No. 1, 2, and 3, for UT examination Austenitic Welds. .

The component was a single sided stainless steel piping weld, 20 inch diameter schedule 80 1.031" nominal Elbow to Valve weld, which limited the upstream scan due to configuration.

A 45° Shear and a 60° RL was used for the axial scans and a 45° Shear for circ scans.

2/5/14

~~53.75~~ Coverage Achieved.

50 %.

RESOLUTION BY: Tommy Brown	REVIEWED BY: Matt Welch	ANII:
LEVEL: III DATE: 03/04/2010	LEVEL: III DATE: 3/9/10	DATE: 3/16/10
		PG. 1 OF 6

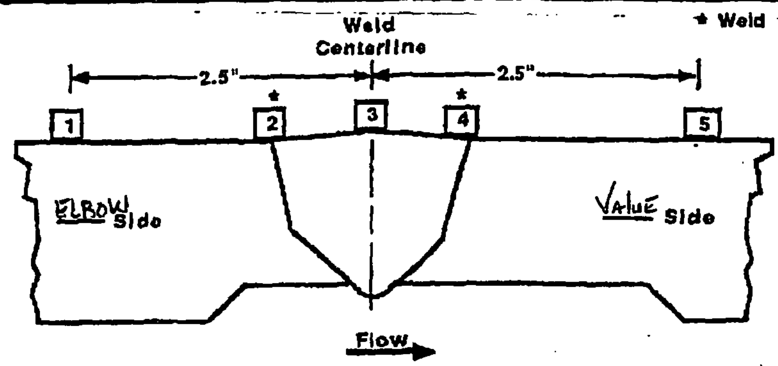
TVA	WALL THICKNESS PROFILE SHEET	REPORT NO: R024

PROJECT: BFNP — WELD NO: DRHR-3-21

UNIT: 3 CYCLE 14 — SYSTEM: RHR

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	1.23			
2	1.19	N		
3	1.20			
4	N/A			A
5	N/A			



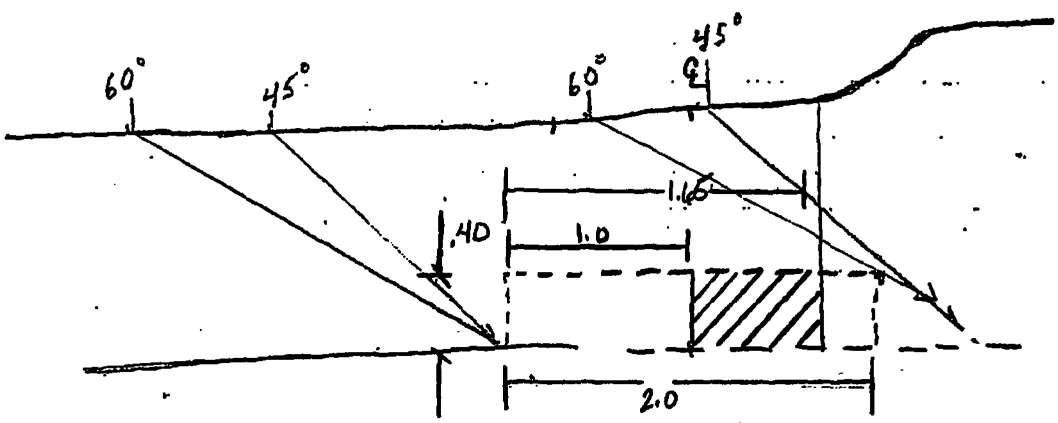
CROWN HEIGHT: FLUSH — DIAMETER: 20"

CROWN WIDTH: 1.5" — WELD LENGTH: 60.45"

	H		W		L		
Scan 3	.4	x	1.0	x	60.45	=	24.18
Scan 4	0	x	0	x	0	=	0
Scan 5	.4	x	1.65	x	60.45	=	39.9
Scan 6	.4	x	1.65	x	60.45	=	39.9

Achieved volume / required volume 48.36 x 4 = 103.98 / 193.44 = ~~53.75%~~ 50% · 2/5/14

Cast valve limits exam to 50%. R Seal III 2/5/14



= Ax Scan - No coverage

THICKNESS & CONTOUR DATA TAKEN FROM PREVIOUS DATA.

EXAMINER: [signature]	REVIEWED BY: [signature]	ANII: [signature]
LEVEL: III	LEVEL: III DATE: 3/9/10	DATE: 3/16/10
DATE: 3/4/10		PAGE 5 OF 6

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R078

(2 pages)

000348

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION DATA SHEET	REPORT NUMBER: R078

PROJECT: BFN	UNIT: 3	CYCLE: 13		COMPONENT ID: RWCU-3-001-071		
EXAMINATION METHOD				SYSTEM: RWCUS	ISI DWG. NO. 3-ISI-0328-C-01	
MT ☐	PT ☐	UT ☒	VT ☐	CODE CLASS: 1		CATEGORY: B-J
PROCEDURE: N-UT-64	REV:11	TC:NA		COFIG.:	Valve TO Pipe	
EXAMINER: TOMMY BROWN LEVEL: II	EXAMINER: ALEX ZIPPERER LEVEL: II			EXAMINER: LEVEL:		EXAMINER: LEVEL:

The package contains the ultrasonic examination data for RWCU-3-001-071.
This exam meets the requirements of NU0313, cat. A, EXREQ 96E-02.
and ASME Section XI, cat.B-J, item B9.11, EXREQ P03-03. ✓
The examination was performed using ASME Section XI, Appendix VII
and Appendix VIII personnel, equipment and techniques as amended by the ✓
10CFR50.55a Final Rule
This exam is a ASME Section XI Pre-Service exam. mm 4/10/08
The joint configuration is a cast S/S pipe to pipe full pen butt weld. ✓

The examination was performed using TVA Procedure N-UT-64 which ✓
implements PDI Procedure PDI-UT-2 for Austenitic pipe welds

The weld was examined using 1.5 mHz., 45 and 60 degree shear waves ✓
and a 70 degree 2.25 mHz shear wave.
No recordable indications, mm 4/10/08
Accees for the exam was limited to a single side due to joint geometry. ✓
Root geometry was recorded at acceptable levels. mm 4/10/08
The achieved examination volume was ~~69%~~ 50%. ✓
RO 2/5/14

RESOLUTION BY:	REVIEWED BY:	ANII:
LEVEL: II DATE: 4/9/08	LEVEL: III DATE: 4/10/08	DATE: 4/23/08
		PG. 1 OF 7

000351

TVA

WALL THICKNESS PROFILE SHEET

REPORT NO: R078

PROJECT: BFN

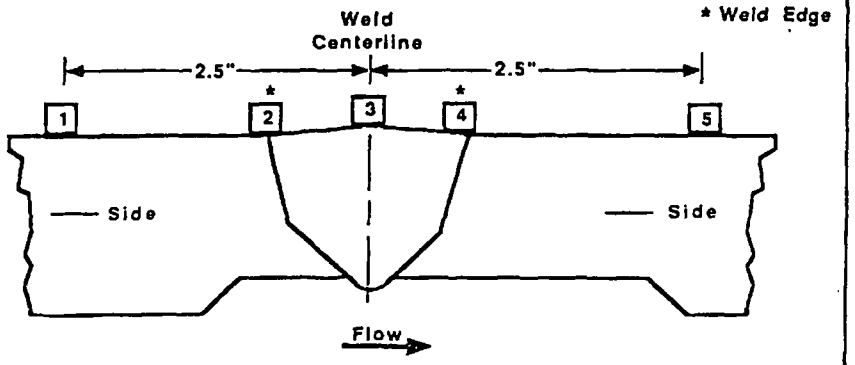
UNIT: 3

WELD NO: RWCU-3-001-071

SYSTEM: RWCU

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	.609			
3	.594			
4	.436			
5	.432			

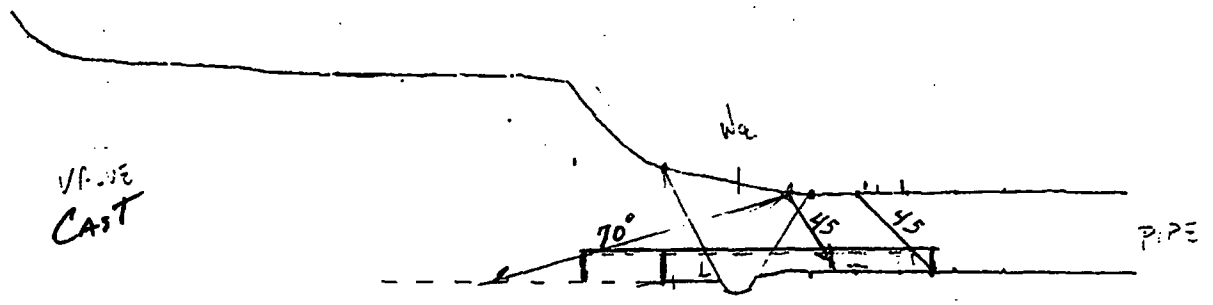


CROWN HEIGHT: Flush

CROWN WIDTH: .85

DIAMETER: 6.0

WELD LENGTH: 20.8



REQUIRED ASME EXAM VOLUME

(.2 x .143) ÷ 2 x 1.9 = .326

.326 x 20.8 = 6.78 in³

ACHIEVED ASME EXAM VOLUME

SCAN 3 CRV OBTAINED = 18 %

(.45 x .143) x 20.8 = .66

.66 x 20.8 = 1.248 1.248/6.78 = 18 %

SCAN 4 OBTAINED 100 %

SCAN 5 + 6 OBSTRUCTED

(.5 x .2) x 20.8 ÷ 6.78 = 31 %

SCAN 5 + 6 CRV OBTAINED

100 % - 31 % = ~~69 %~~ 50 %. ✓ Cast value limits exam to 50 %. R Seal III 2/5/14

EXAMINER: Tony DeRuso

LEVEL: II

DATE: 4/9/08

REVIEWED BY: Mark Welch

LEVEL: III DATE: 4/10/08

ANII:

DATE: 4/23/08

PAGE 4 OF 7

TVA 19668 (NP-5-89) 1-104-999-44

✓

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R098

(5 pages)

000475

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R098

PROJECT: BFN UNIT: 3 CYCLE: 13				COMPONENT ID: RWCU-3-001-070	
EXAMINATION METHOD				SYSTEM: RWCU ✓	ISI DWG. NO. 3-ISI-0332-C SHT 1 ✓
MT ☐	PT ☐	UT ☒	VT ☐	CODE CLASS: 1	CATEGORY: B-J ✓
PROCEDURE: N-UT-64		REV: 11 ✓	TC: N/A	CONFIG.: Sweep-O-let	TO Valve
EXAMINER: Patrick Mahoney		EXAMINER: Alex Zipperer		EXAMINER: N/A	EXAMINER: N/A
LEVEL: II		LEVEL: ~~II~~ TRN 4/19/08		LEVEL: N/A	LEVEL: N/A

This report contains the manual ultrasonic data associated with the examination of
Weld RWCU-3-001-070 ✓
The component examined was a S/S Sweep-O-Let to Valve Weld, 6" Diameter, Schedule 80,
with single sided access.

A 1.5Mhz. 45° Shear Wave, 60° Shear Wave, 1/2 Vee Path were used during the exam.
A 60° RL was used for the examination.
Maintained a 5%-20% ID Roll.

This examination satisfies the requirements of ASME Section XI, Category B-J,
Item number B9.11, EXREQ P03-03, and BWRVIP-75A, Cat A, EXREQ, B02-02.
This is an ASME Section XI Pressure exam. 4/19/08
This exam was performed with equipment, procedures, and personnel qualified
In accordance with ASME Section XI, Appendix VIII as amended by the final rule.

There were limitations on the exam. Refer to attached drawings for calculations.

Scan 3 coverage = 51.75%
Scan 4 coverage = 0
Scan 5 coverage = 35.15%
Scan 6 coverage = 35.15%

Total Code Coverage obtained = 30.5%

Ref WO# 07-714055-000

The indications are associated with joint geometry and are acceptable. 4/19/08

RESOLUTION BY: Patrick Mahoney	REVIEWED BY:	ANII:
LEVEL: II DATE: 4/18/08	LEVEL: III DATE: 4/19/08	4/24/08
		PG. 1 OF 13

✓

000477

TVA

WALL THICKNESS PROFILE SHEET

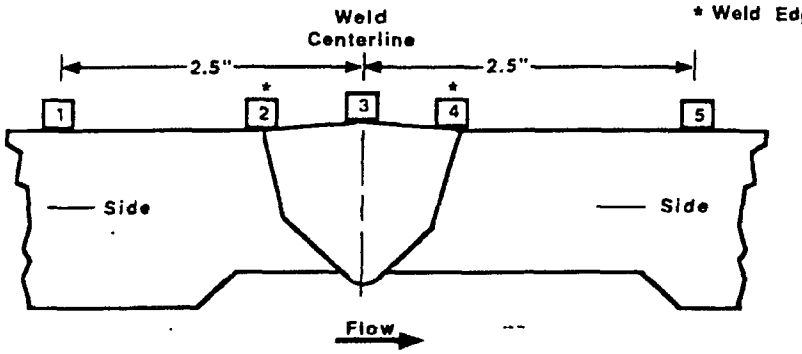
REPORT NO: R098

PROJECT: BFN
UNIT: 3 CYCLE 13

WELD NO: RWCU-3-001-070
SYSTEM: RWCU

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

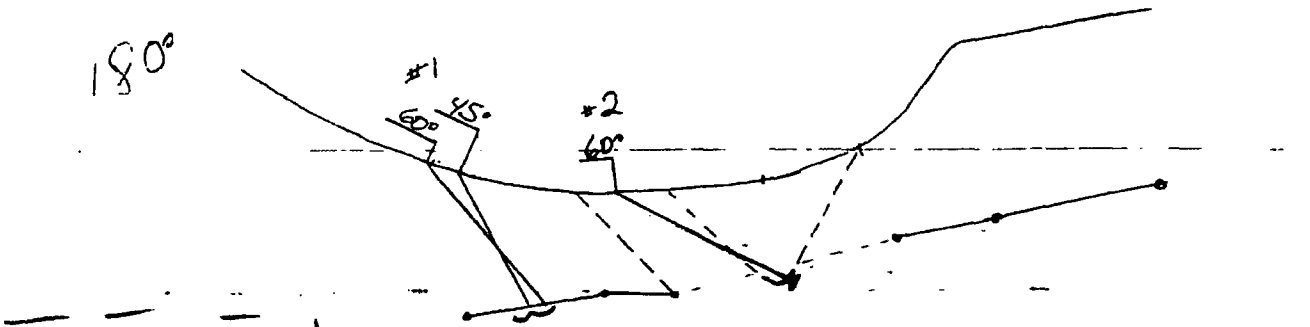
Position	0°	90°	180°	270°
1				
2				
3				
4				
5				



CROWN HEIGHT: FLUSH
CROWN WIDTH: ~~1.0"~~ 1.6

DIAMETER: 6.625"
WELD LENGTH: 21¼

PLOT SHEET



#1 60° SD = 1.8" MP = 1.06"

45° SD = 1.6" MP = .87

#2 70° SD = 1" MP = 1.28"

60° ~~SD = .8"~~ MP = 1.08"

#1 IS 360° ID REF.

#2 IS INT 360°

EXAMINER: [signature]
LEVEL: II
DATE: 4/18/08

REVIEWED BY: [signature]
LEVEL: III DATE: 4/19/08

ANII: [signature]
DATE: 4/24/08

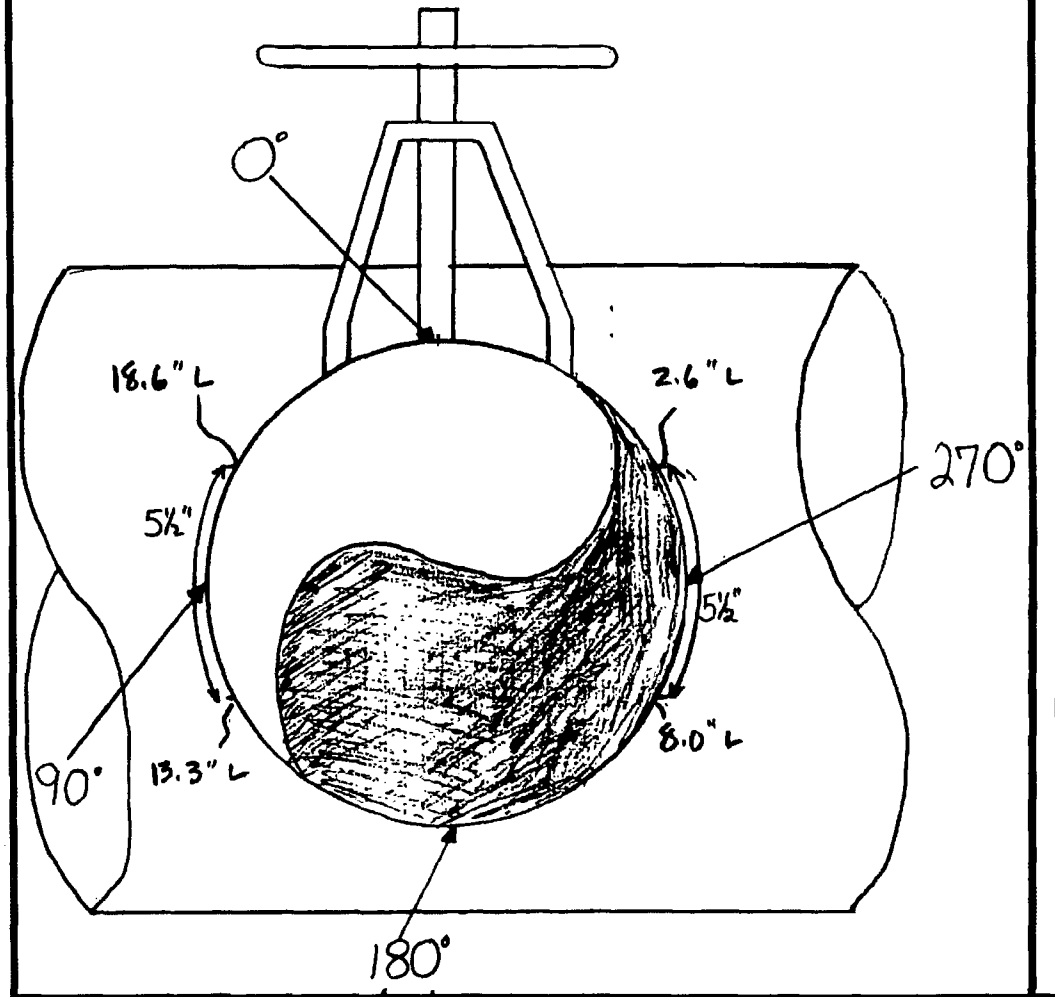
PAGE 3 OF 13

TVA 19668 (NP-5-89)

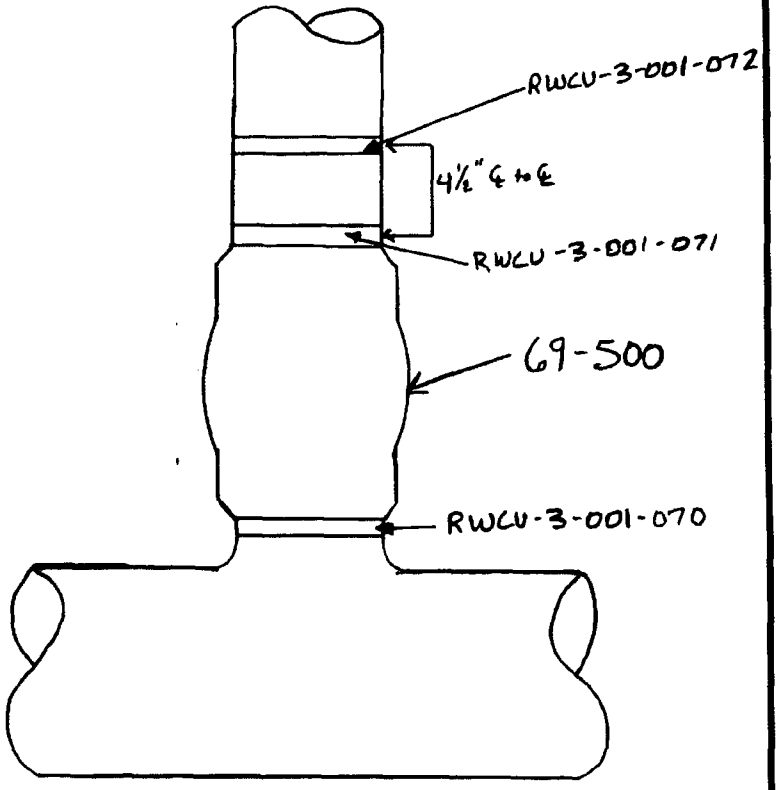
1-108-999-44

TVA Office of Nuclear Power	PROJECT: BFN SYSTEM: RWCU Unit: 3 CYCLE 13 WELD NO.: RWCU-3-001-070	REPORT NO.: R098

TOP VIEW



SIDE VIEW



BY: [signature] LEVEL: II DATE: 4/18/08 PAGE 4 OF 13

TVA 19669 (ONP-6-88)

0004478

000480

TVA — WALL THICKNESS PROFILE SHEET

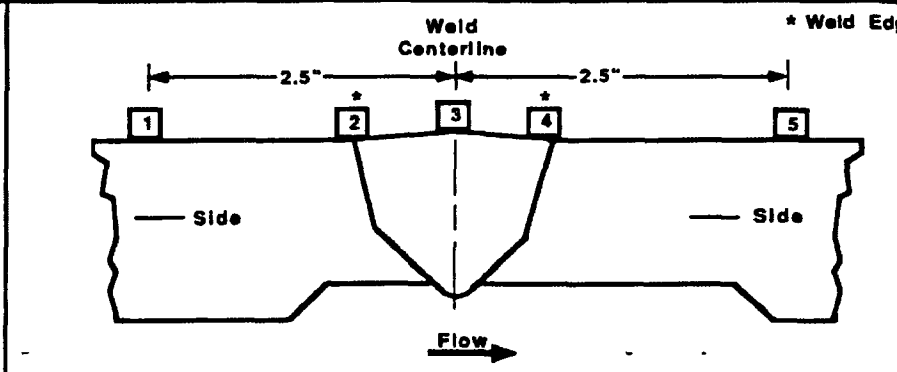
REPORT NO: R098

PROJECT: BFN
UNIT: 3 CYCLE 13

WELD NO: RWCU-3-001-070
SYSTEM: RWCU

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

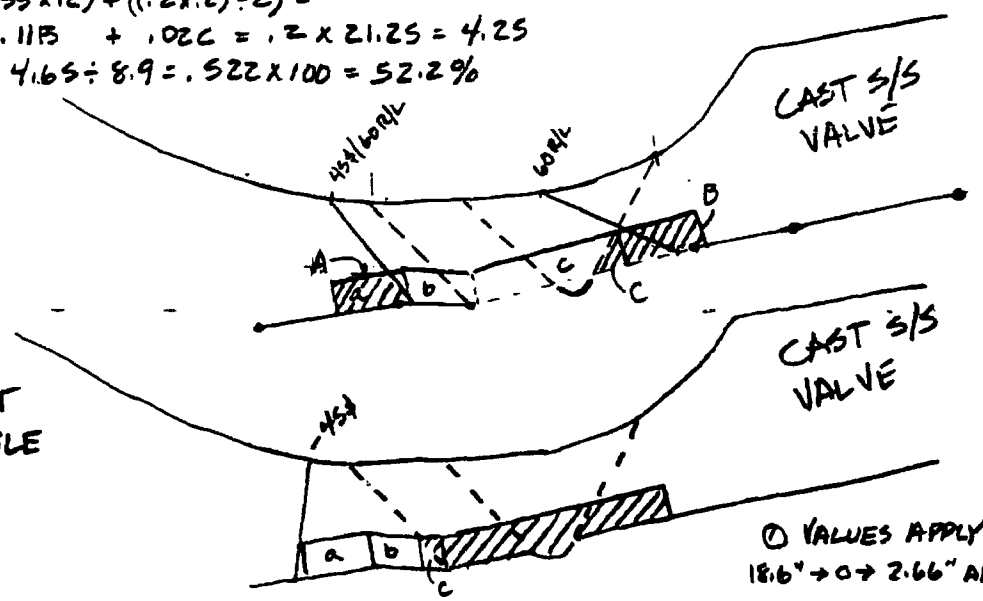
Position	0°	90°	180°	270°
1				
2				
3				
4				
5				



CROWN HEIGHT: FLUSH
CROWN WIDTH: 1.6"
DIAMETER: 6625"
WELD LENGTH: 21¼

REQUIRED EXAM VOLUME: 8.9³ in
a=.35x.2=.07 b=.2x.36=.072 c=.2x1.4=.28 / a+b+c=.422 x 21.25 = 8.9³ in

ACHIEVED VOLUME SCAN 3: 52.2% ①
(.35x.2)+(.53x.2)+((.2x.2)÷2)=
.07A + .11B + .02C = .2 x 21.25 = 4.25
8.9 − 4.25 = 4.65 ÷ 8.9 = .522 x 100 = 52.2%



▨ = AREA NOT ACCESSABLE

① VALUES APPLY TO "L" DIMS: 18.6" → 0 → 2.66" AND 8" TO 13.3"

ACHIEVED VOLUME CIRC SCANS 5 & 6: 31.6% ①
a=.35x.2=.07 b=.25x.2=.05 c=(.1x.25)÷2=.0125 / a+b+c=.1325 x 21.25 = 2.81³ in
2.81 ÷ 8.9 = .316 x 100 = 31.6%

EXAMINER: [signature]
LEVEL: II
DATE: 4/18/08

REVIEWED BY: [signature]
LEVEL: III
DATE: 4/19/08

ANII: [signature]
DATE: 4/24/08

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TVA 19668 (NP-5-89)

1-108-999-44

000481

TVA

WALL THICKNESS PROFILE SHEET

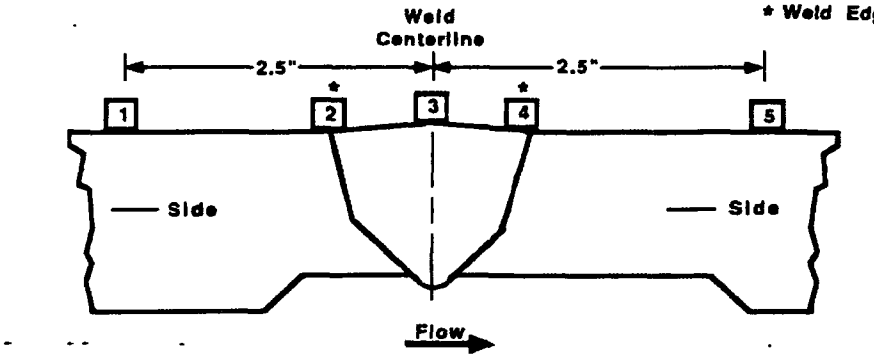
REPORT NO: R098

PROJECT: BFN
UNIT: 3 CYCLE 13

WELD NO: RWCU-3-001-070
SYSTEM: RWCU

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1				
2				
3				
4				
5				



CROWN HEIGHT: FLUSH
CROWN WIDTH: 1.16"
DIAMETER: 16.625"
WELD LENGTH: 21 1/4"

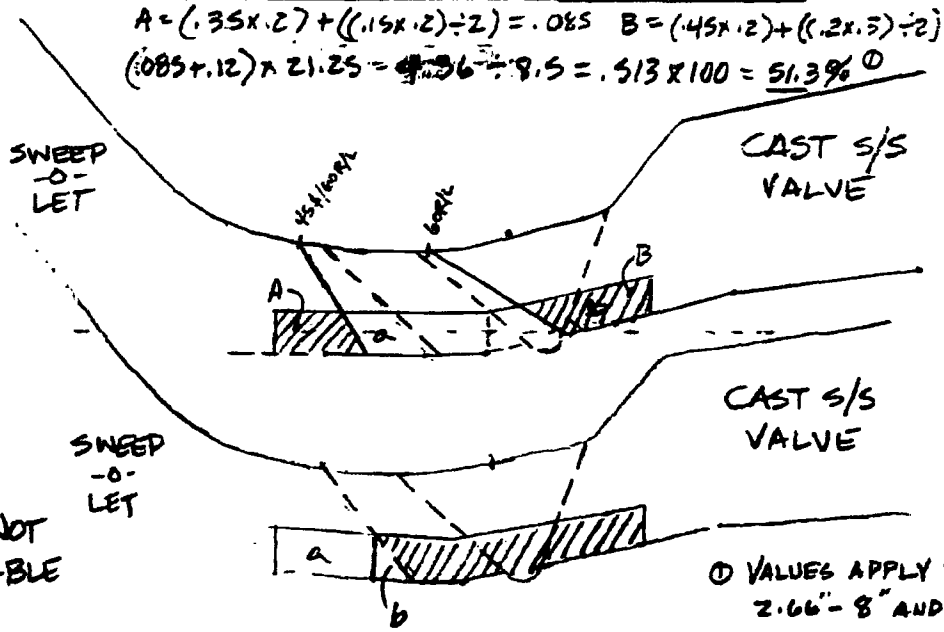
REQUIRED EXAM VOLUME: 8.53 in

a = .2 x 1.15 = .23 b = .2 x .85 = .17 .23 + .17 = .4 in x 21.25 = 8.5 in 90°

ACHIEVED VOLUME AXIAL SCAN 3 = 51.3% ①

A = (.35 x .2) + ((.15 x .2) ÷ 2) = .085 B = (.45 x .2) + ((.2 x .5) ÷ 2) = .12

(.085 + .12) x 21.25 = 4.36 ÷ 8.5 = .513 x 100 = 51.3% ①



▨ = AREA NOT ACCESSABLE

① VALUES APPLY TO "L" DIMS 2.66" - 8" AND 13.5 - 18.6

ACHIEVED VOLUME CIRC SCANS 5 + 6 = 38.7% ①

a = .65 x .2 = .13 b = (.25 x .2) ÷ 2 = .025 / .13 + .025 = .155 x 21.25 = 3.29

3.29 ÷ 8.5 = .387 x 100 = 38.7%

EXAMINER: [signature]
LEVEL: II
DATE: 4/18/08

REVIEWED BY: [signature]
LEVEL: III DATE: 4/19/08

ANII: [signature]
DATE: 4/24/08

PAGE 1 OF 13

TVA 19668 (NP-5-89)

1-108-999-44

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R237

(2 pages)

C00055

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION SHEET	REPORT NUMBER: R237

PROJECT: *BFN* UNIT: *1* CYCLE *07*		COMPONENT ID: *DRHR-1-2*	
EXAMINATION METHOD		SYSTEM: RHR	ISI DWG NO: *ISI-0362-C-08*
MT ☐ PT ☐	UT ☑ VT ☐	CONFIGURATION:	CATEGORY
PROCEDURE: *N-UT-82*	REV 3 TC: N/A	*P TO VLV*	R/A ~~C-F-2~~
EXAMINER: Patrick Mahoney LEVEL: II	EXAMINER: N/A LEVEL:	EXAMINER: N/A LEVEL:	EXAMINER: N/A LEVEL:

Total coverage calculated to be approximately * See Below %

A Manual UT Exam was performed on DRHR-1-2 (A C/S PIPE TO S/S CAST Valve)

This exam was performed to meet the requirements of ASME Section XI 2001 ED, 2003 ADDENDA, Cat R-A, item R1.16D, and NU D313, Item D.

TVAN Procedure N-UT-82 Rev 3 which incorporates the current EPRI Diss. Metal Procedure PDI-UT-10 Rev C, was used for examination

A 45° RL, 60° RL & 45° Shear were used for Axial Scans

A 45° Shear & 40° ~~S~~ RL were used for circ. SCANS.

No Scans from the Valve side due to configuration

* CODE REQUIRED COVERAGE = ~~98.2%~~ 50%

* PROCEDURE REQUIRED COVERAGE ~~82.2%~~ 50%

* Refer to coverage sheet for Calculations

RESOLUTION BY:	REVIEWED BY	ANII:
[signature]	[signature]	[signature]
LEVEL II DATE: 11-14-08	LEVEL: III DATE: 11/17/08	DATE: 11/21/08
		Page: 1 OF 9

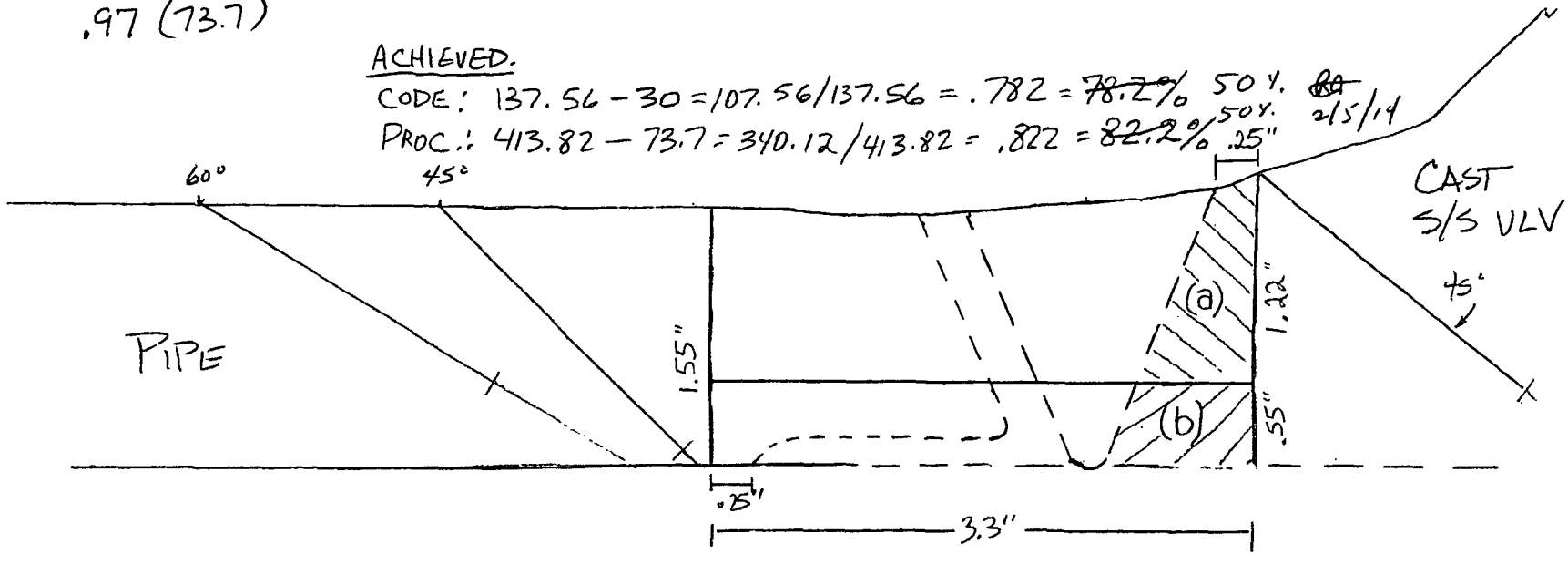
ACCESS: FORMS DATABASE R-10/04/01

TVA Office of Nuclear Power	PROJECT: BFN SYSTEM: RHR Unit: 1 CYCLE 7 WELD NO.: DRHR 1-2	REPORT NO.: RZ37

(a) .57 (43.3)
(b) .40 (30)
.97 (73.7)

REQ.
CODE: 1.81 (3.3x.55)x76= 137.56
PROC: 5.445((3.3x(1.55+1.75/2))x76 = 413.82

ACHIEVED.
CODE: 137.56 − 30 = 107.56/137.56 = .782 = ~~78.2%~~ 50% ~~80~~ 2/5/14
PROC.: 413.82 − 73.7 = 340.12/413.82 = .822 = ~~82.2%~~ 50% .25"



Cast valve limits exam to maximum 50%.
Coverage RA Lvl. III 2/5/14

BY: P. Mahoney LEVEL: II DATE: 11/14/08 PAGE 9 OF 9

TVA 19669 (ONP-6-88)

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R253

(2 pages)

000396 ✓

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION DATA SHEET	REPORT NUMBER: R253

PROJECT: BFN UNIT: 1		CYCLE: 07		COMPONENT ID: RCRD-1-50		
EXAMINATION METHOD				SYSTEM: CRD	ISI DWG. NO. 1-CHM-1098-C-2	
MT ☐	PT ☐	UT ☒	VT ☐	CODE CLASS: N/A		CATEGORY: NU0313
PROCEDURE: N-UT-82		REV: 3	TC: N/A	CONFIG.:	Valve TO Elbow	
EXAMINER: Tommy Brown LEVEL: III		EXAMINER: N/A LEVEL:		EXAMINER: N/A LEVEL:		EXAMINER: N/A LEVEL:

A Manual Ultrasonic Examination was performed on weld RCRD-1-50. A carbon steel elbow to a stainless steel valve.

The exam was performed to meet the requirements of NU0313, category C EXREQ B02-02

This exam was performed using TVA Nuclear Procedure N-UT-82 Rev. 3, which incorporates PDI-UT 10 Rev C Addenda No. 1, the EPRI Procedure for doing UT on Dissimilar Metal Welds.

A 60° Shear. 60° RL and 70°RL was used for the axial scans. A 42° RL and 45° Shear was used for the circ scans.

No scan on the Down Stream side of the weld due to Elbow to Valve configuration.

80.6% Procedure coverage was obtained.

RESOLUTION BY: Tommy Brown	REVIEWED BY:	ANII:
LEVEL: III DATE: 11/7/08	LEVEL: III DATE: 11/20/08	DATE: N/A
		PG. 1 OF 11

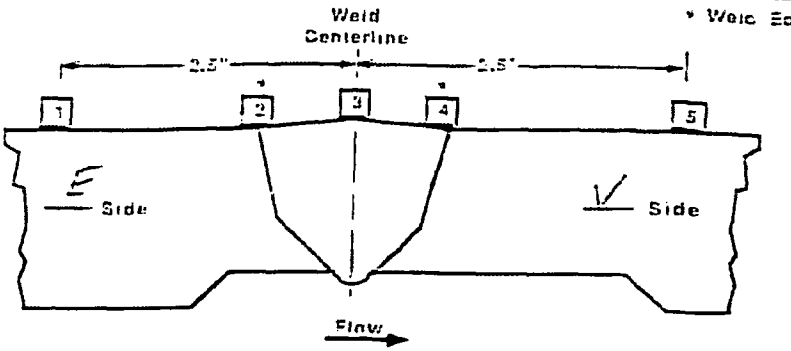
000406

TVA	WALL THICKNESS PROFILE SHEET	REPORT NO: R253

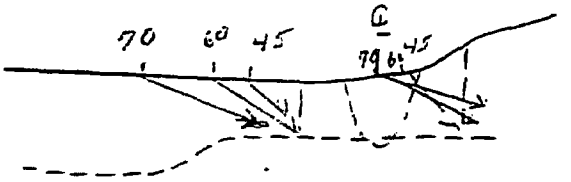
PROJECT: BFN
UNIT: 1
WELD NO: FCRD-1-SW
SYSTEM: CRD

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	.59			
2	.31			
3	.32			
4	N/A			
5	N/A			



CROWN HEIGHT: Flush
CROWN WIDTH: .45"
DIAMETER: 4"
WELD LENGTH: 14.5



.31x.2 = .279 x 14.5 = 4.046
4.046 + .03x14.5 = 4.481
4.481 - .06x14.5 = 3.611
3.611 ÷ 4.481 = .806 x 100 = 80.6%

EXAMINER: [signature] 11-6-06
REVIEWED BY: [signature] 11/20/06
ANII: N/A
DATE:

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R254

(2 pages)

000407 ✓

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION DATA SHEET	REPORT NUMBER: RZ54

PROJECT: BFN UNIT: 1 CYCLE: 07				COMPONENT ID: RCRD-1-52			
EXAMINATION METHOD				SYSTEM: CRD	ISI DWG. NO. 1-CHM-1098-C-2		
MT ☐	PT ☐	UT ☒	VT ☐	CODE CLASS: N/A		CATEGORY: ~~B-A~~ NU0313 Exreq 08	
PROCEDURE: N-UT-82	REV: 3	TC: N/A		CONFIG.:	Pipe	TO	Valve
EXAMINER: Tommy Brown	EXAMINER: N/A			EXAMINER: N/A		EXAMINER: N/A	
LEVEL: III	LEVEL:			LEVEL:		LEVEL:	

A Manual Ultrasonic Examination was performed on weld RCRD-1-52. A carbon steel pipe to a stainless steel valve.

The exam was performed to meet the requirements of NU0313, category C EXREQ B02-02

This exam was performed using TVA Nuclear Procedure N-UT-82 Rev. 3, which incorporates PDI-UT 10 Rev C Addenda No. 1, the EPRI Procedure for doing UT on Dissimilar Metal Welds.

A 60° RL, 70°RL, and a 60° Shear was used for the axial scans. A 42°RL and 45° Shear was used for the circ scans

No scan on the Down Stream side of the weld due to Pipe to Valve configuration.

88% Procedure coverage was obtained.

RESOLUTION BY: Tommy Brown	REVIEWED BY:	ANII:
Tony D Brown		DATE: N/A
LEVEL: III DATE: 10/31/08	LEVEL: III DATE: 11/20/08	PG. 1 OF 11

000417

TVA

WALL THICKNESS PROFILE SHEET

REPORT NO: R254

PROJECT: BFN

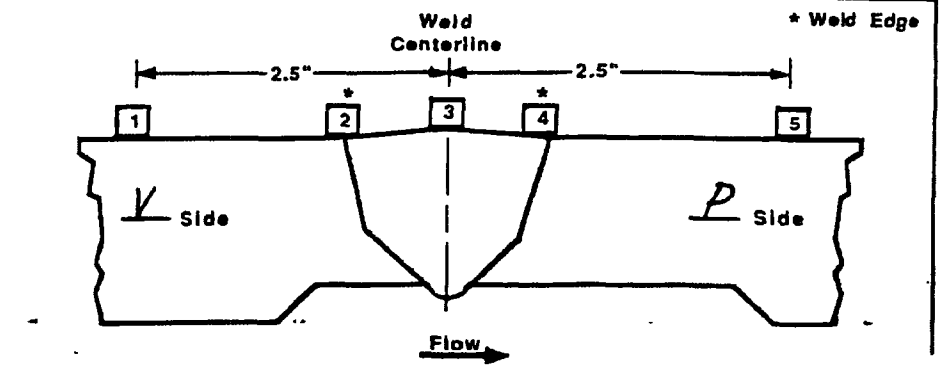
UNIT: 1

WELD NO: RCRD-1-52

SYSTEM: CRD

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	.39		N	
3	.41			A
4	.43			
5	.53			

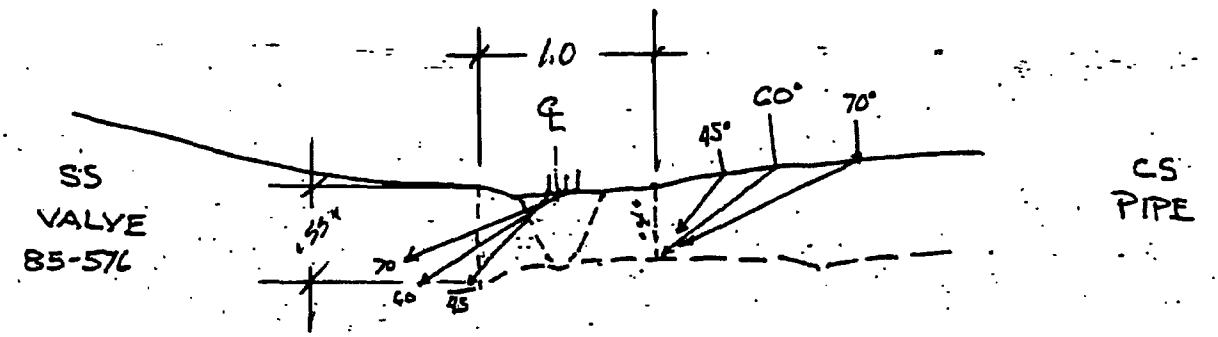


CROWN HEIGHT: Flush

CROWN WIDTH: 0.45

DIAMETER: 4"

WELD LENGTH: 14.5



Exam volume = 1.0x((.55+.4)÷2) = .475x14.5 = 6.89 ^{3} in.

Not examined = ((.25x.45)÷2)x14.5 = .816 ^{3} in.

Achieved (6.89-.816)÷6.89 = .88x100 = 88%

EXAMINER: [signature]

LEVEL: II

DATE: 10/21/08

REVIEWED BY: [signature]

LEVEL: III DATE: 11/20/08

ANII: N/A

DATE:

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Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

R257

(2 pages)

000439 ✓

TENNESSEE VALLEY AUTHORITY	EXAMINATION SUMMARY AND RESOLUTION DATA SHEET	REPORT NUMBER: R257

PROJECT: BFN UNIT: 1			CYCLE: 07	COMPONENT ID: RCRD-1-49		
EXAMINATION METHOD				SYSTEM: CRD	ISI DWG. NO. 1-CHM-1098-C-2	
MT ☐	PT ☐	UT ☒	VT ☐	CODE CLASS: N/A		CATEGORY: NU0313
PROCEDURE: N-UT-82		REV: 3	TC: N/A	CONFIG.:	Valve TO Elbow	
EXAMINER: Tommy Brown		EXAMINER: N/A		EXAMINER: N/A		EXAMINER: N/A
LEVEL: III		LEVEL:		LEVEL:		LEVEL:

A Manual Ultrasonic Examination was performed on weld RCRD-1-49. A stainless steel valve to a carbon steel elbow.

The exam was performed to meet the requirements of NU0313, category C EXREQ B02-02

This exam was performed using TVA Nuclear Procedure N-UT-82 Rev. 3, which incorporates PDI-UT 10 Rev C Addenda No. 1, the EPRI Procedure for doing UT on Dissimilar Metal Welds.

A 45° RL, 60° RL, and 70°RL was used for the axial scans. A 42° RL, 40° RL, and 45° Shear was used for the circ scans.

No scan on the Up Stream side of the weld from 3.5" to 12.5" due to Valve to Elbow configuration. Scans from 0" to 3.5" and from 12.5" were in weld repair area.

80.6% Procedure coverage was obtained.

RESOLUTION BY: Tommy Brown	REVIEWED BY:	ANII: N/A
LEVEL: III DATE: 11/7/08	LEVEL: II DATE: 11/20/08	DATE:
		PG. 1 OF 18

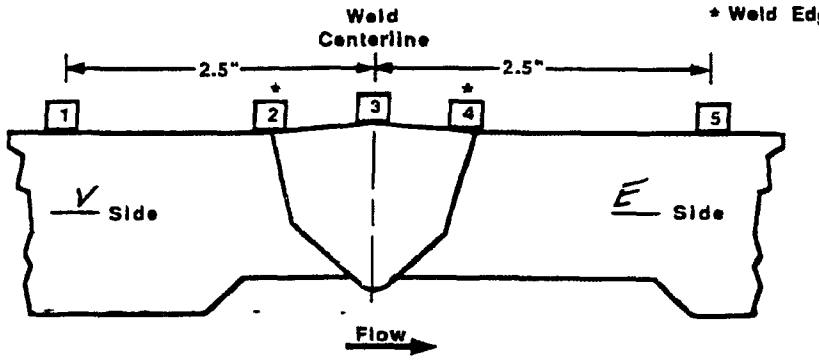
000455

TVA	WALL THICKNESS PROFILE SHEET	REPORT NO: RZST

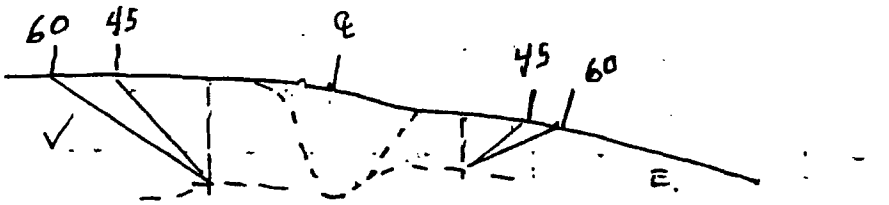
PROJECT: BFN
UNIT: 1
WELD NO: PCRD-1-49
SYSTEM: CRD

Record Thickness Measurements As Indicated, Including Weld Width, Edge-To-Edge At 0°

Position	0°	90°	180°	270°
1	N/A			
2	.57			
3	.58			
4	.34		-	-
5	N/A			



CROWN HEIGHT: Flush DIAMETER: 4"
CROWN WIDTH: 9" (270° to 90°) 4" (90° to 270°) WELD LENGTH: 15.0"



FLOW →

EXAMINER: [signature]
LEVEL: III
DATE: 10/31/08

REVIEWED BY: [signature]
LEVEL: III DATE: 11/20/08

ANII: N/A
DATE:

PAGE 17 OF 18

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-10-024

(2 pages)

000201

Ultrasonic Examination

Site/Unit:	BFN / 1	Procedure:	N-UT-84	Outage No.:	U1R08
Summary No.:	03122-ISI-BFN1	Procedure Rev.:	0	Report No.:	UT-10-024
Workscope:	ISI	Work Order No.:	1-SI-4.6.G	Page:	1 of 7

Code: Section XI 2001 Ed/2003 Add Cat./Item: B-J/B9.11 Location: Drywell

Drawing No.: 1-CHM-1081-C-1 Description: EL - VLV

System ID: 068 - REACTOR WATER RECIRCULATING SYSTEM

Component ID: RWR-1-001-003 Size/Length: N/A Thickness/Diameter: 1.088" / 28"

Limitations: Single Side Austenitic Exam

Comments:

See attached supplemental sheets for examination data consisting of:

- **Phased Array Calibration Data Sheet (Shear)**
- **Phased Array Calibration Data Sheet (Longitudinal)**
- **Piping Examination Data Sheet**
- **Coverage Plot**
- ***Indication Plot***
- **Wall Thickness Profile Sheet**

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%: No Reviewed Previous Data: Yes

Examiner	Level II-PDI	Signature	Date	Reviewer	Signature	Date
Nissen, Jason P.			10/28/2010	Matt Welch, LIII		11/1/10
Examiner	Level N/A	Signature	Date	Site Review	Signature	Date
N/A				N/A		
Other	Level TRN	Signature	Date	ANII Review	Signature	Date
Clairday, Joey, E.			10/28/2010	Sam Flood		11/8/10

Vendor Examination For UT

Supplemental Report

Report No.: UT-10-024

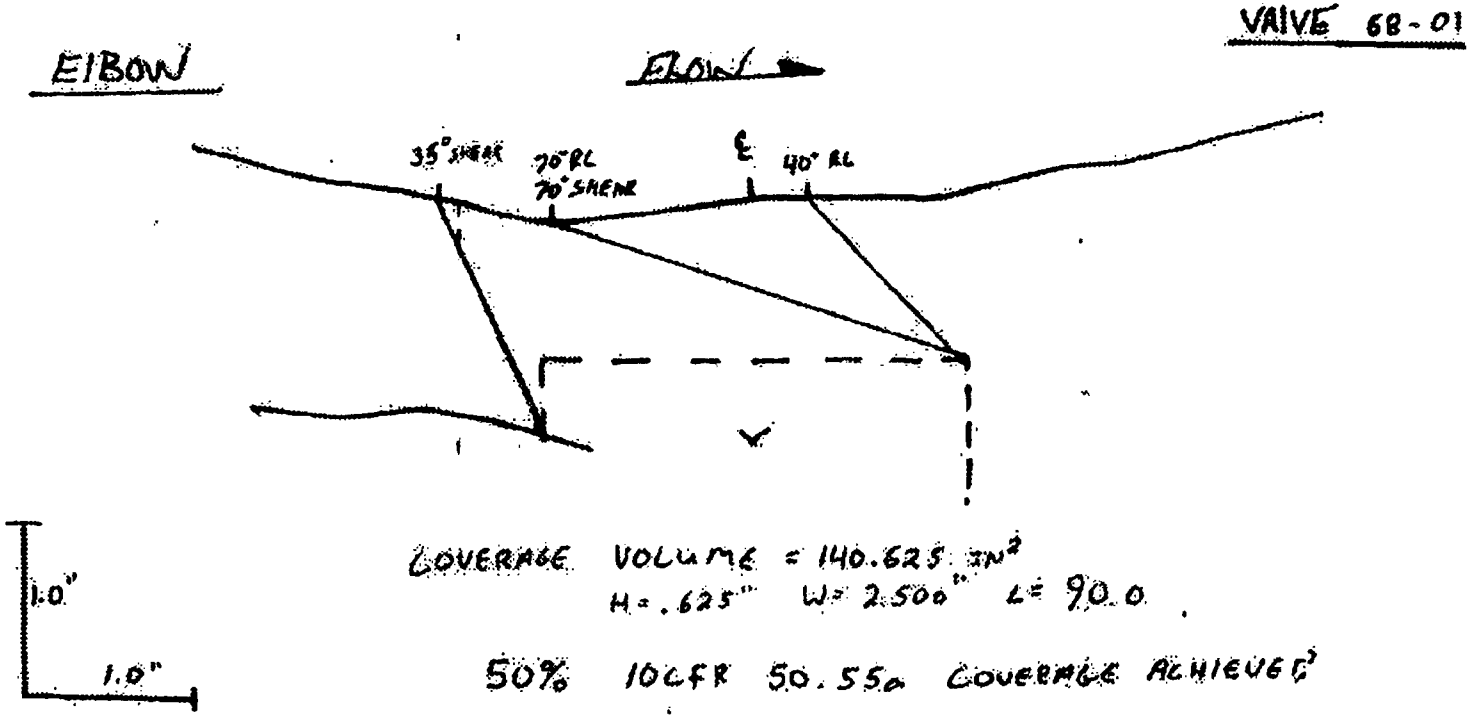
Page: 5 of 7

Summary No.: 03122-ISI-BFN1

Examiner:	Nissen, Jason P.	Level:	II-PDI	Reviewer:	Matt Welch, LIII	Date:	11/1/10
Examiner:	N/A	Level:	N/A	Site Review:	N/A	Date:	
Other:	Clairday, Joey, E.	Level:	TRN	ANII Review:	Sam Flood	Date:	11/8/10

Comments: RWR-1-001-003 Coverage Plot

Sketch or Photo: O:\Iddeal_Server\Iddeal_BFN\Documentation\U1R8 Scanned Data\RWR-1-001-003 Coverage Plot.jpg



000205

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-10-026

(1 page)

Supplemental Report

Report No.: UT-10-026

Page: 5 of 7

Summary No.: 03155-ISI-BFN1

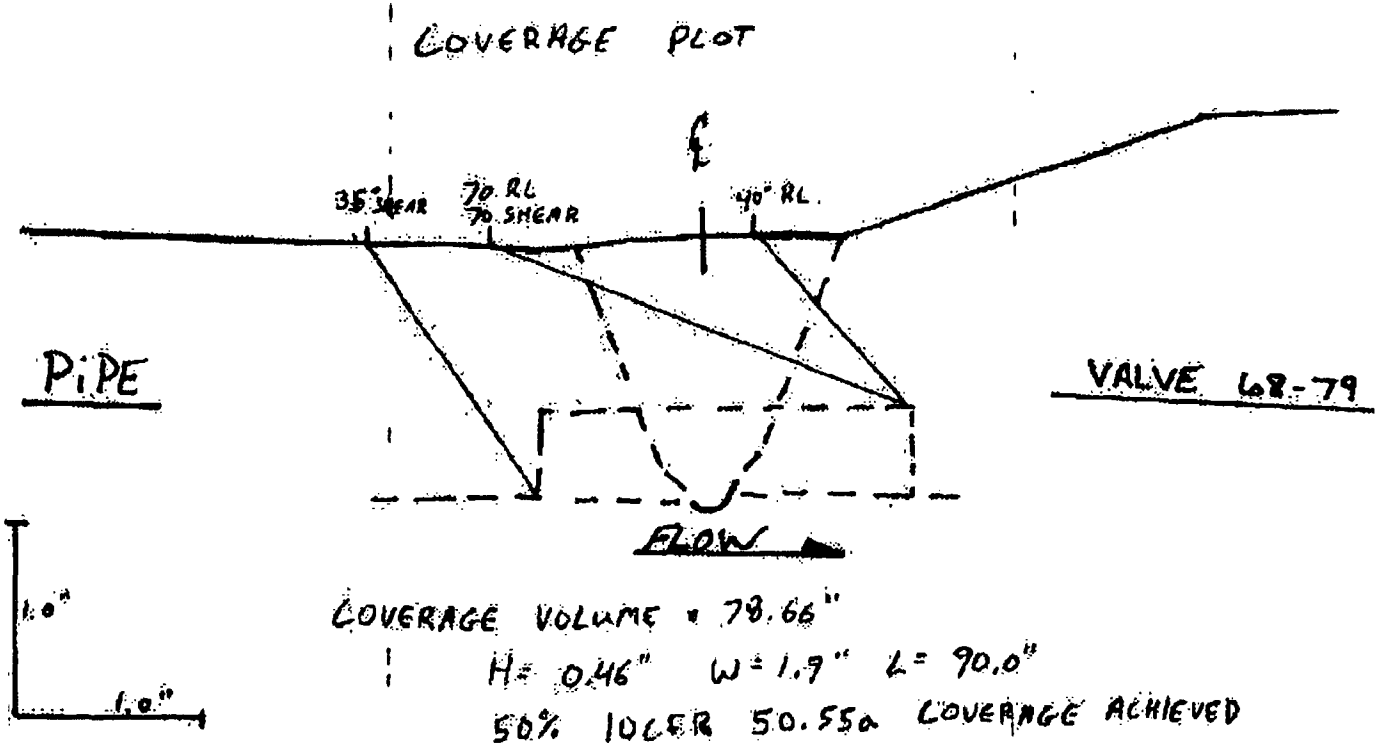
Examiner: Nissen, Jason P. Level: II-PDI Reviewer: Matt Welch, LIII Date: 11/1/10

Examiner: N/A Level: N/A Site Review: N/A Date:

Other: PARKER, FREDDIE, J. Level: TRN ANII Review: ~~Sam Flood~~ Jane B. Eamigh 11/8/10 Date: 11/8/10

Comments: RWR-1-002-012 Coverage Plot

Sketch or Photo: O:\Iddeal_Serve\Iddeal_BFN\Documentation\U1R8 Scanned Data\RWR-1-002-012 Coverage Plot.jpg



000213

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-10-028

(1 page)

Supplemental Report

Report No.: UT-10-028

Page: 5 of 6

Summary No.: 03252-ISI-BFN1

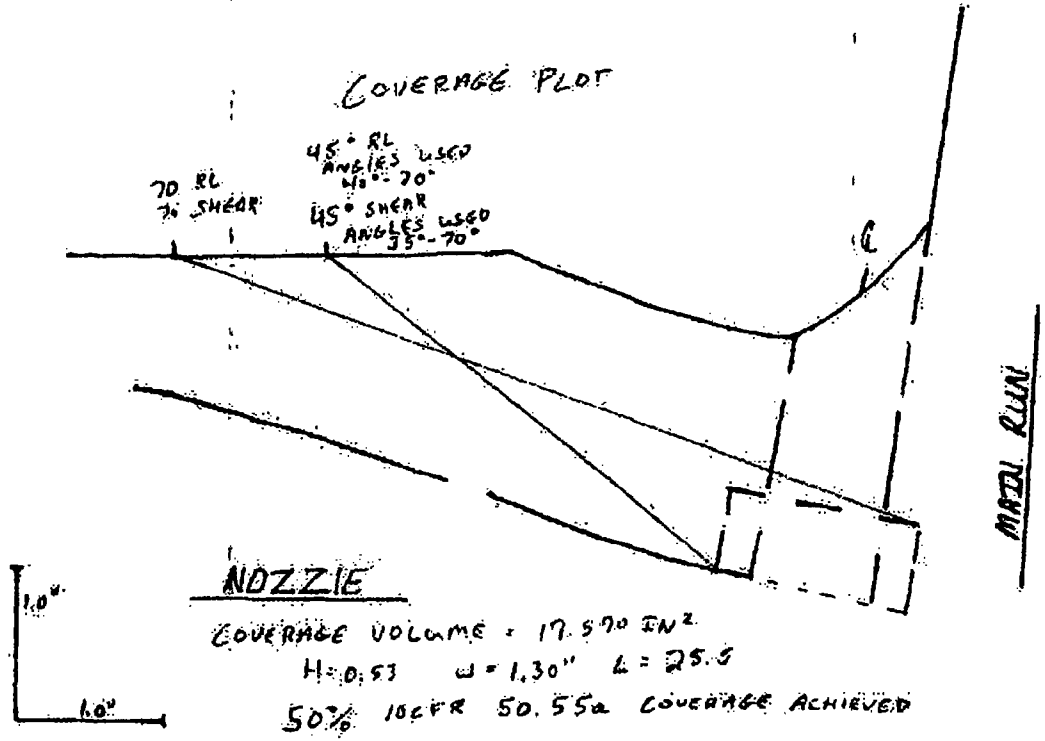
Examiner: Nissen, Jason P. — Level: II-PDI — Reviewer: Matt Welch, LIII — Date: 11/1/10

Examiner: N/A — Level: N/A — Site Review: N/A — Date:

Other: Clairday, Joey, E. — Level: TRN — ANII Review: ~~Sam Flood~~ N/A B. Eamigh 11/8/10 — Date: 11/8/10

Comments: **RWR-1-001-S023A Coverage Plot**

Sketch or Photo: O:\Iddeal_Server\Iddeal_BFN\Documentation\U1R8 Scanned Data\RWR-1-001-S023A Coverage Plot.jpg



000221

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-10-030

(1 page)

Supplemental Report

Report No.: UT-10-030

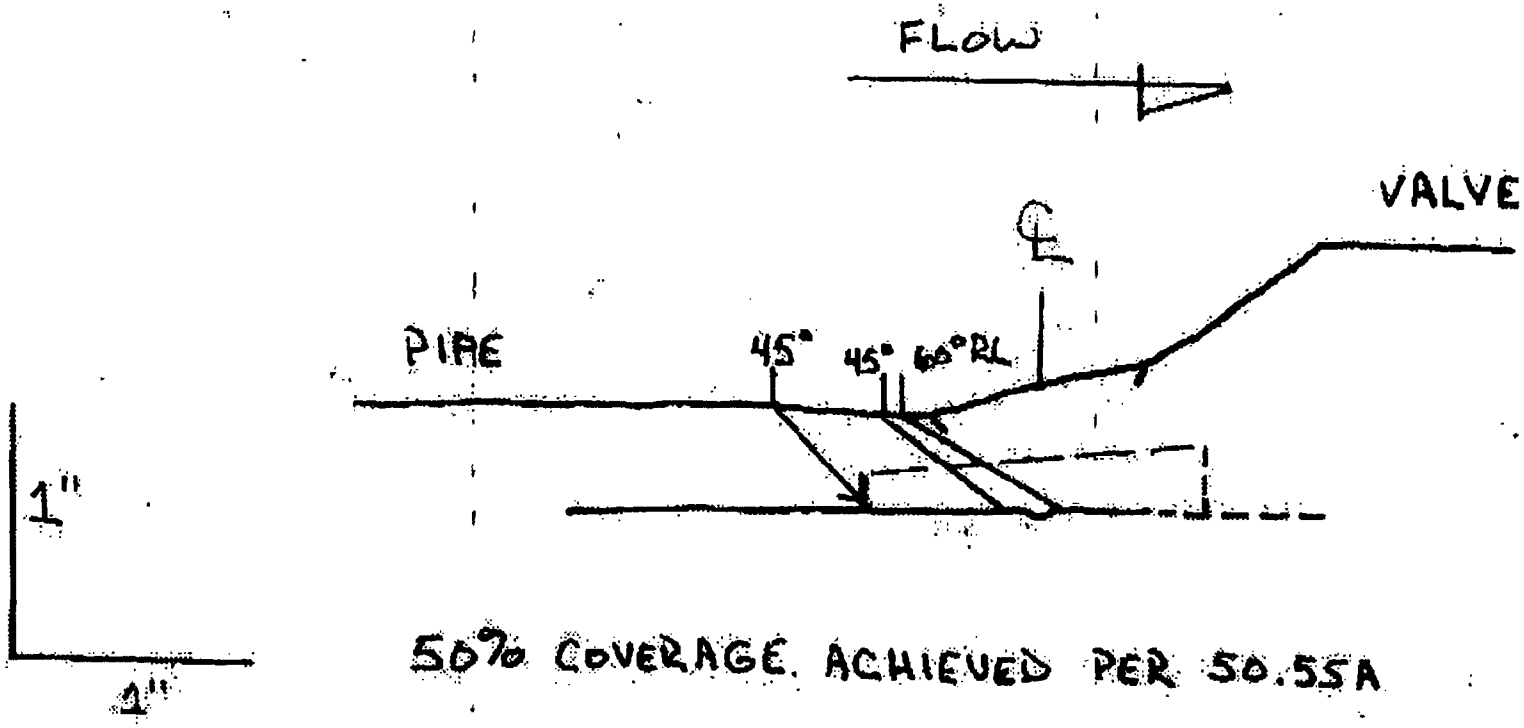
Page: 3 of 4

Summary No.: 03110-ISI-BFN1

Examiner:	Newgard, Jerry W.		Level:	III(N)	Reviewer:	Matt Welch, LIII	Date: 11/3/10
Examiner:	N/A		Level:	N/A	Site Review:	N/A	Date:
Other:	Walker, Scott		Level:	TRN	ANII Review:	~~Sam Flood~~ B. Eamigh 11/8/10	Date: 11/8/10

Comments: None

Sketch or Photo: O:\Iddeal_Server\Iddeal_BFN\Documentation\U1R8 Scanned Data\RWCU-1-001-019 Coverage Plot.jpg



000226

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-12-027

(1 page)

Supplemental Report

Report No.: UT-12-027

Page: 3 of 4

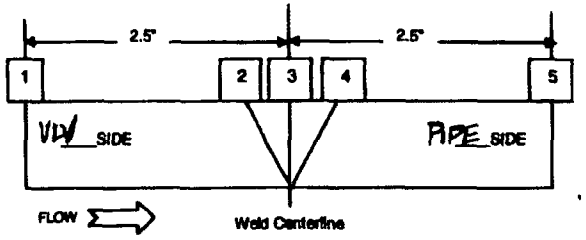
Summary No.: 05109-ISI-BFN3

Sketch or Photo: O:\Iddeal_Server\Iddeal_BFN\Documentation\U3R18 Scanned Data\GR-3-63 TC.jpg

THICKNESS AND CONTOUR

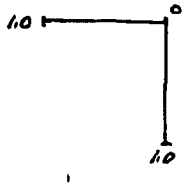
Position	0	90	180	270
1	N/A			
2*	.26		N	
3	.31		A	
4*	.22			
5	.20			

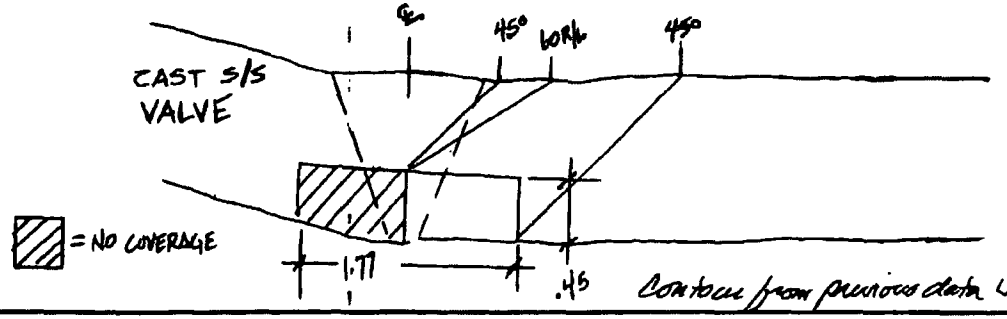
* Weld edge



Examiner:	Reviewer:	ANII:
Print name: ED FISH Date:	Print name: Date:	Print name: Date:
COMPONENT ID: GR-3-63		
CROWN WIDTH: 1.26	WELD LENGTH: 89.0"	
CROWN HEIGHT: FLUSH	DIAMETER: 28"	

Required exam volume:
.45x1.77x89 = 70.9 IN^3
Obtained exam volume:
70.9 - (.45x.89x81) = 35.6 IN^3/70.9 = 502x100 = 50.2%





[redacted]

0002377

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-12-031

(1 page)

Supplemental Report

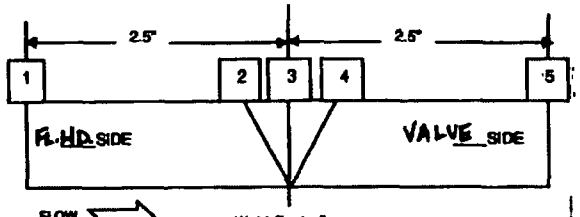
Summary No.: 05100-ISI-BFN3

Sketch or Photo: O:\Iddeal_Server\Iddeal_BFN\Documentation\U3R18 Scanned Data\DRHR-3-12.jpg

THICKNESS AND CONTOUR

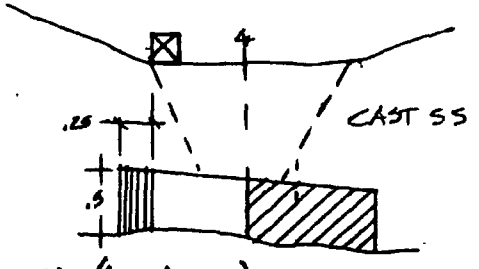
Position	0	90	180	270
1	N/A			
2*	1.4		1.4	
3	1.4		1.4	
4*	1.4		1.4	
5	N/A			

* Weld edge



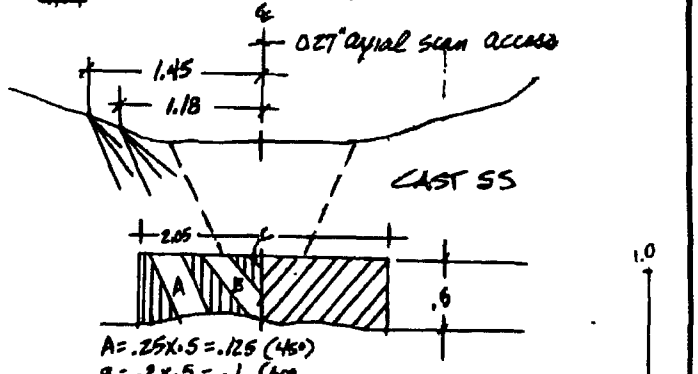
Examiner: EC FS 4/14/12	Reviewer: Unintelligible 4/17/12	ANII: B. Eamigh 4/19/12
Print name: ED FISH Date:	Print name: MATT WELCH Date:	Print name: BRUCE EAMIGH Date:
COMPONENT ID: DRHR-3-12		
CROWN WIDTH: 1.6"	WELD LENGTH: ~~77.285~~ 75.4"	
CROWN HEIGHT: FLUSH	DIAMETER: 24.6" OD	

Required sram volume:
(2.05x.5) x 75.4 = 77.285 in³
Obtained sram volume:
axial - 17.5/77.285 = .226
circ - 28.9/77.285 = .374
((.374+.226)÷2) x 100 = 30%



(77.285/2) - ((5x.26) x 75.4) = 28.9 in³ ACHIEVED CIRC

= OBSTRUCTED VOLUME = CAST SS



A = .25x.5 = .125 (45°)
B = .2x.5 = .1 (60°
C = (.15x.1)÷2 = .0075 (70°)
(A+B+C) x 75.4 = 17.5 in² ACHIEVED AXIAL

000251

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
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Weld Inspection Report Excerpts

UT-12-039

(1 page)

Supplemental Report

Report No.: UT-12-039

Page: 5 of 17

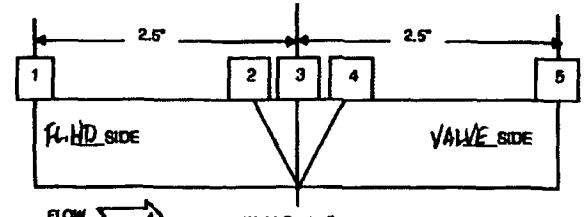
Summary No.: 01518-ISI-BFN3

Sketch or Photo: O:\Iddeal_Server\Iddeal_BFN\Documentation\U3R18 Scanned Data\DRHR-3-03 TC.jpg

THICKNESS AND CONTOUR

Position	0	90	180	270
1	N/A			
2*	1.4			
3	1.35			
4*	1.4			
5	N/A			

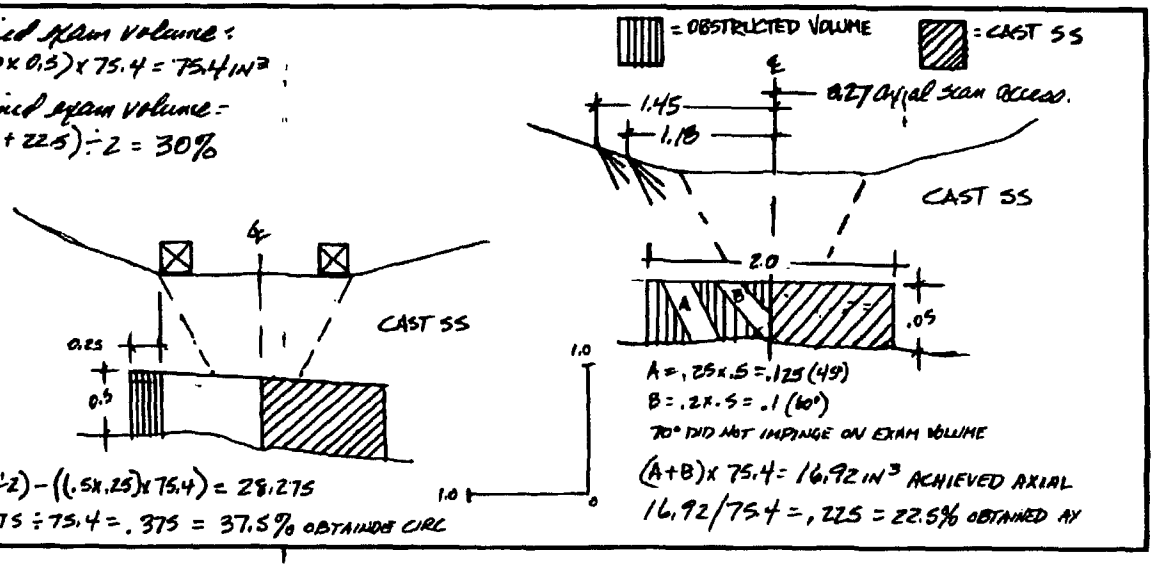
* Weld edge



Examiner: ED FISH 4-18-12	Reviewer: [signature] 4/24/12	ANII: N/A
Print name: ED FISH Date:	Print name: MATT WELCH Date:	Print name: Date:
COMPONENT ID: DRHR-3-03		
CROWN WIDTH: 1.55	WELD LENGTH: 75.4	
CROWN HEIGHT: FLUSH	DIAMETER: 24.6	

Required exam volume:
(2.0 x 0.5) x 75.4 = 75.4 IN³

Obtained exam volume:
(37.5 + 22.5) ÷ 2 = 30%



(75.4 ÷ 2) − ((.5 x .25) x 75.4) = 28.275

28.275 ÷ 75.4 = .375 = 37.5% OBTAINED CIRC

A = .25 x .5 = .125 (45)

B = .2 x .5 = .1 (60°)

70° DID NOT IMPINGE ON EXAM VOLUME

(A+B) x 75.4 = 16.92 IN³ ACHIEVED AXIAL

16.92 / 75.4 = .225 = 22.5% OBTAINED AX

[redacted]

00027808

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-12-054

(1 page)

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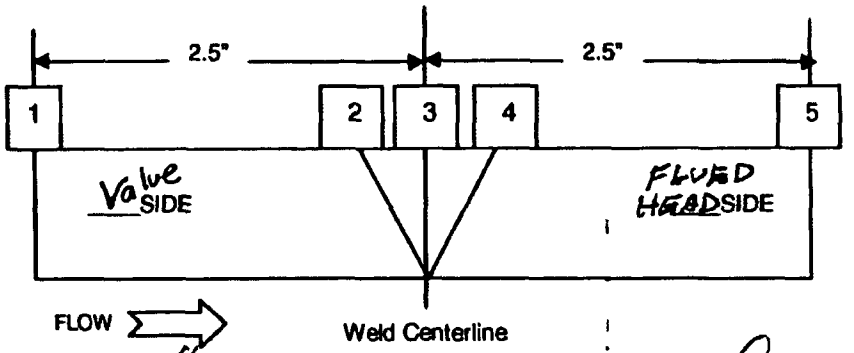
pg 3/4
UT-12-054

THICKN. . AND CONTOUR

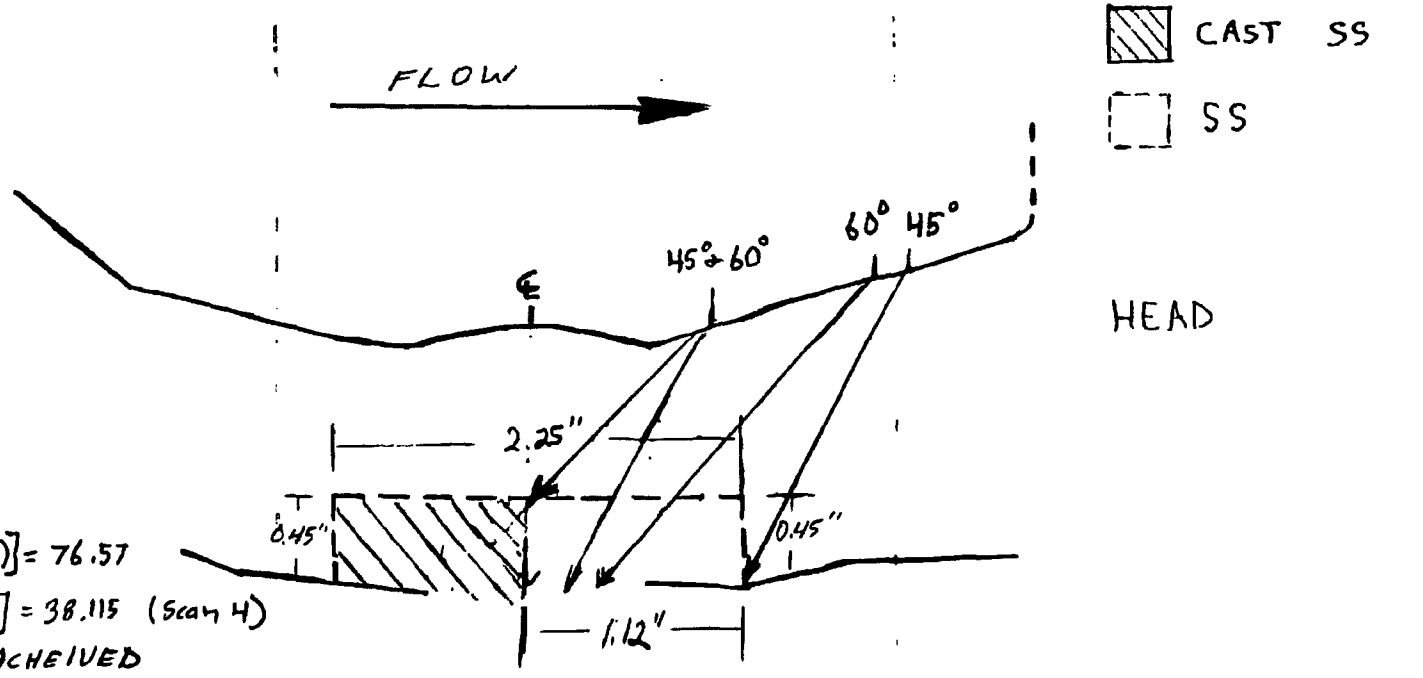
Position	0	90	180	270
1	1.35	1.59	1.54	1.70
2*	1.30	1.37	1.35	1.40
3	1.33	1.38	1.32	1.29
4*	1.28	1.41	1.43	1.33
5	1.69	1.72	1.79	1.74

* Weld edge



Examiner: [signature]	Reviewer: [signature] 10/3/12	ANII: [signature]
Print name: Kenneth Fisk Date: 9/26	Print name: MATT WELCH Date:	Print name: Samuel Flood 11/9/12 Date:
COMPONENT ID: DRHR-1-12		
CROWN WIDTH: 1.20"	WELD LENGTH: 75.625	
CROWN HEIGHT: 0.10"	DIAMETER: 24.0"	

SCAN 3 - 0%
SCAN 4 - 49.78 %
SCAN 5 - 0 %
SCAN 6 - 0 %



REV= [(.45 x 2.25) (75.625)] = 76.57
OEV = [(.45 x 1.12) (75.625)] = 38.115 (Scan 4)
12.44% OEV ACHEIVED

0000041

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-12-055

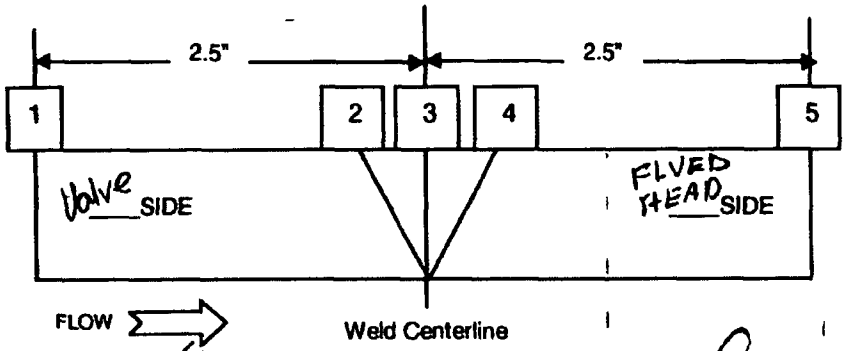
(1 page)

LT OSS
PS 3/4
UT-12-055

THICKN... AND CONTOUR

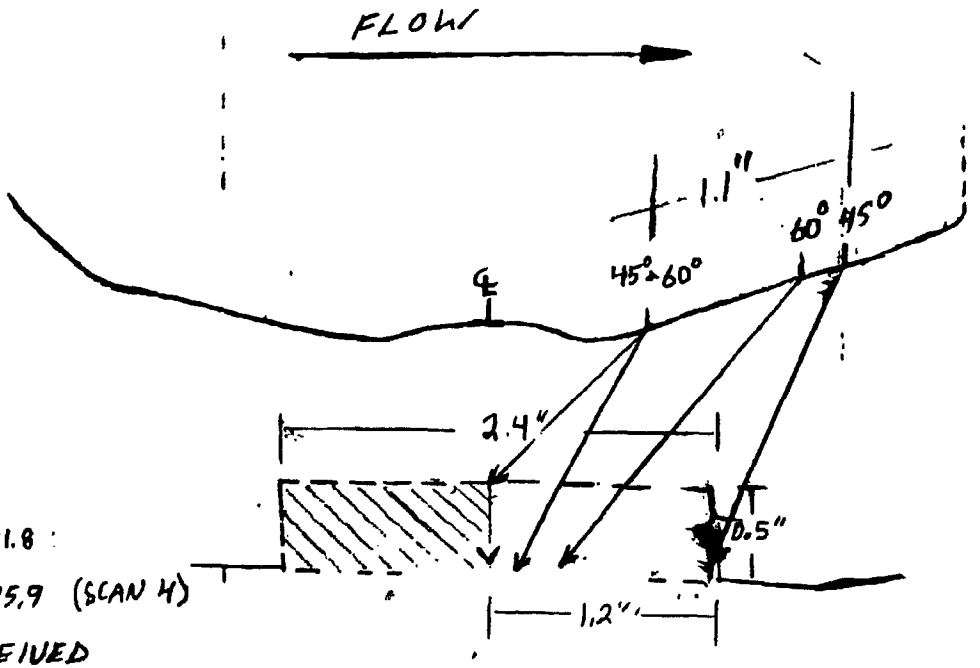
Position	0	90	180	270
1	1.49	1.54	1.42	1.38
2*	1.37	1.50	1.39	1.33
3	1.30	1.41	1.32	1.37
4*	1.42	1.47	1.44	1.44
5	1.66	1.64	1.58	1.66

* Weld edge



Examiner: [signature]		Reviewer: [signature] 10/31/12	ANII: [signature]
Print name: Kenneth Fish	Date: 10/31	Print name: MATT WELCH Date:	Print name: Samuel Flood 11/9/12 Date:
COMPONENT ID: DRHR-1-3			
CROWN WIDTH: 1.2"		WELD LENGTH: 76.5	
CROWN HEIGHT: 0.1"		DIAMETER: 24.0"	

SCAN 3 - 0%
SCAN 4 - 50%
SCAN 5 - 0%
SCAN 6 - 0%



REV = [(.5" x 2.4") (76.5")] = 91.8

OEV = [(.5" x 1.2") (76.5")] = 45.9 (SCAN 4)

12.5% OEV ACHEIVED

000045

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

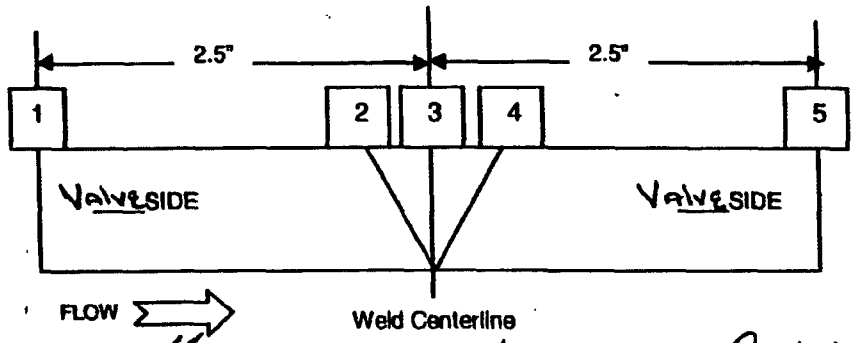
UT-12-058

(1 page)

THICKNESS AND CONTOUR

Position	0	90	180	270
1	**	**	**	**
	.57	.55	.57	.55
2*	.54	.52	.51	.50
3	.60	.55	.53	.58
4*	.61	.54	*	.55
5	*	*	*	*

* Weld edge

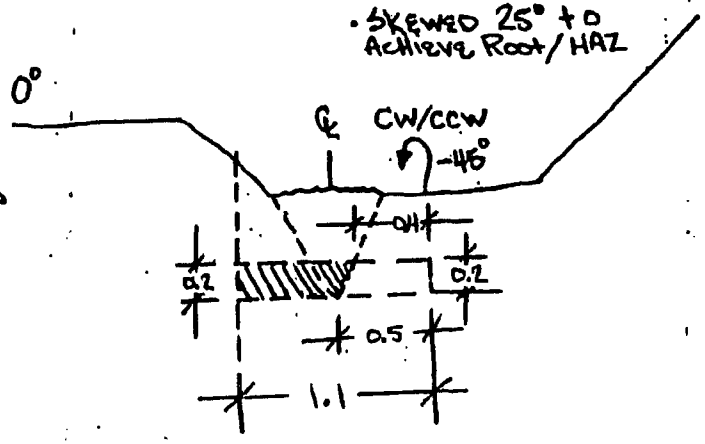


UT-12-058
pg 3/5
4 11/10/12

Examiner: [signature]	Reviewer: [signature] 10/31/12	ANII: [signature]
Print name: EDWARD FISH Date: 10/31/12	Print name: MATT WELCH Date:	Print name: Samuel Floyd 11/10/12 Date:
COMPONENT ID: RWCU-1-005-0060		
CROWN WIDTH: 0.6	WELD LENGTH: 15.0	
CROWN HEIGHT: FLUSH / AS WELDED	DIAMETER: 4.0 NOM	

VALVE (SHV-069-0580)

VALVE (CKV-069-0579)



REV = [(0.2)(1.1)(15.0)] = 3.3 ^{3} IN

OBST VOLUME = 3.3 - 1.52 = 1.78 ^{3} IN

S3 = 0%
S4 = 0%
S5 = 46%
S6 = 46%
TOTAL COVERAGE = 23%

THICKNESS AND CONTOUR TAKEN FROM PREVIOUS DATA, REPORT # R-1066/UIRF09/6R

** THICKNESS READINGS TAKEN APPROXIMATELY .5 INCHES FROM TOE WELD. 11/10/12

* NO THICKNESS READING TAKEN DUE TO COMPONENT CONFIGURATION.

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Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-12-060

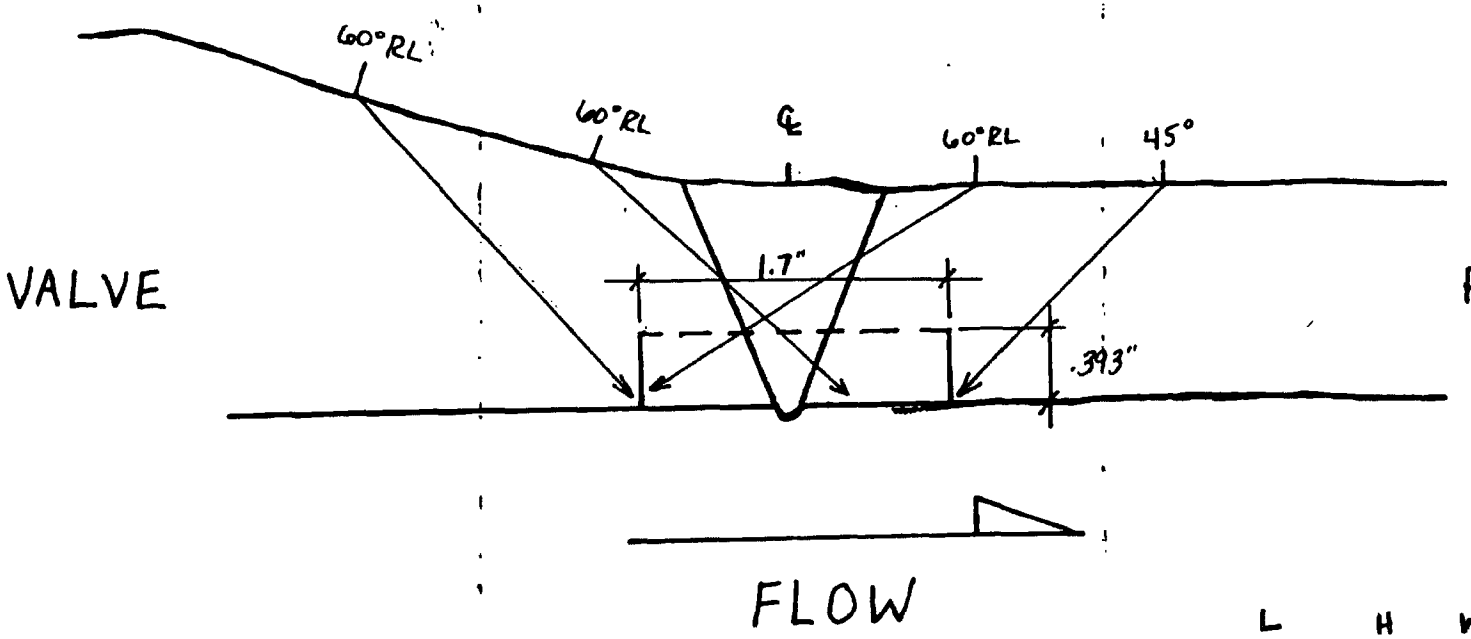
(1 page)

COVERAGE PLOT

Component ID: RWR-1-002-053

UT-R-060 Rev 3/3

Examiner:	Reviewer:	ANII: N/A
Print name: Richard C. May	Print name: MATT WELCH	Print name: N/A
Date: 10-31-12	Date: 11/3/12	Date:



REV = $88.75" \times .393" \times 1.7" = 59.29^{3}in$ (L × H × W)

OEV = 50% Single Sided Exam

* Not to scale - Obtained from previous data - UIRF6 - Report R-832

000063

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Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-004

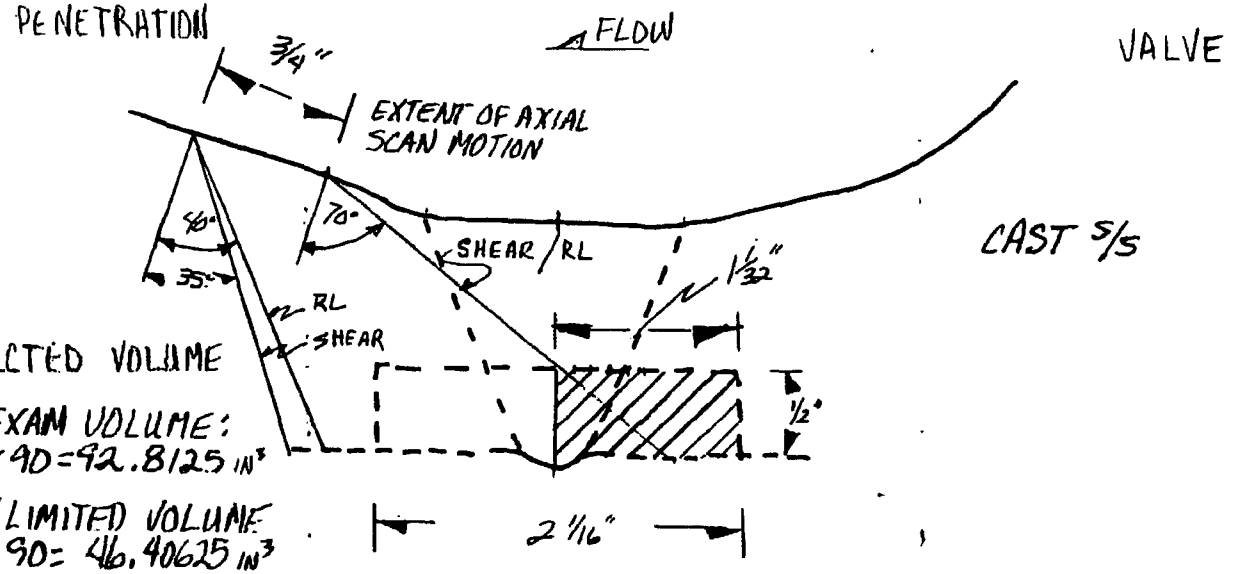
(1 page)

UT-13-004

CO. AGE PLOT

Component ID: DRHR-2-12

Examiner: D.R.K.	Reviewer: Matt Welch	ANII: N/A
Print name: DAVID KLEINTAN	Print name: MATT WELCH	Print name:
Date: 22 MAR 2013	Date: 3/26/13	Date:



OBSTRUCTED VOLUME

REQUIRED EXAM VOLUME:
2.0625 X .5 X 90 = 92.8125 IN³

OBSTRUCTED / LIMITED VOLUME
1.03125 X .5 X 90 = 46.40625 IN³

OBTAINED EXAM VOLUME:
92.8125 - 46.40625 = 46.40625
40.40625 / 92.8125 X 100 = 50%

pg 10/10

UT13004

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-013

(6 pages)

UT-13-013

PROJECT: BFN	UNIT: 2	CYCLE: 17
SYSTEM: Rector Water Cleanup System		Component: RCRD-2-49
Examiner: D. R. Kleiman		Reviewer: Matt Welch
Print Name: David Kleiman		Print Name: Matt Welch
Date: 29-Mar-13		Date: 4/18/13

BS 11/22

Items #		
1	RL Axial Full Required Exam Volume 15.125*1.018*((0.669+0.491)/2)=	8.9304
2	RL Axial Lower One Third Required Exam Volume 15.125*1.018*((0.223+0.163)/2)=	2.9717
3	Shear Axial Full Required Exam Volume 15.125*1.018*((0.669+0.491)/2)=	8.9304
4	Shear Axial Lower One Third Required Exam Volume 15.125*1.018*((0.223+0.163)/2)=	2.9717
5	RL Full Clockwise and CounterClockwise Scanning Required exam Volume 15.125*1.018*((0.669+0.491)/2)=	8.9304
6	RL Lower One Third Clockwise and CounterClockwise Scanning Required exam Volume 15.125*1.018*((0.223+0.163)/2)=	2.9717
7	Shear Full Clockwise and CounterClockwise Scanning Required exam Volume 15.125*1.018*((0.669+0.491)/2)=	8.9304
8	Shear Lower One Third Clockwise and CounterClockwise Scanning Required exam Volume 15.125*1.018*((0.223+0.163)/2)=	2.9717
9	RL Axial Full Volume Obstructed Exam from the Elbow side (1.081/2)*5.135*0.491=	1.3628
10	RL Axial Full Volume Obstructed Exam from the Valve side (1.081/2)*(2.7948*3)*0.669=	3.0318
11	RL Axial Lower One Third Volume Obstructed Exam from the Elbow side (1.081/2)*5.135*0.163=	0.4524
12	RL Axial Lower One Third Volume Obstructed Exam from the Valve side (1.081/2)*(2.7948*3)*0.223=	1.0106
13	Shear Axial Full Volume Obstructed Exam plus the area that is not qualified by this procedure from the Elbow side 15.125*((0.492*0.607)/2)/2)=	2.2585
14	Shear Axial Full Volume Obstructed Exam plus the area that is not qualified by this procedure from the Valve side (15.125*((0.492*0.607)/2)/2))+((1.081/2)*(1.9781*3)*0.669)=	2.1458
15	Shear Axial Lower One Third Volume Obstructed Exam plus the area of exam that is not qualified by this procedure from the Elbow side 15.125*((0.206*0.171)/2)/2)	0.1332
16	Shear Axial Lower One Third Volume Obstructed Exam plus the area of exam that is not qualified by this procedure from the Valve side (15.125*((0.206*0.171)/2)/2))+((1.081/2)*(1.9781*3)*0.223)=	0.8485
17	RL Full Clockwise and CounterClockwise Scanning Obstructed exam Volume 15.125*((.669*.255)+(.491*.251))=	4.4443
18	RL Lower One Third Volume Clockwise and CounterClockwise Scanning Obstructed exam Volume 15.125*((.223*.255)+(.163*.251))=	1.4789
19	Shear Full Clockwise and CounterClockwise Scanning Obstructed exam Volume plus the area of exam that is not qualified by this procedure 15.125*((0.492*0.607)/2)	2.2585

D

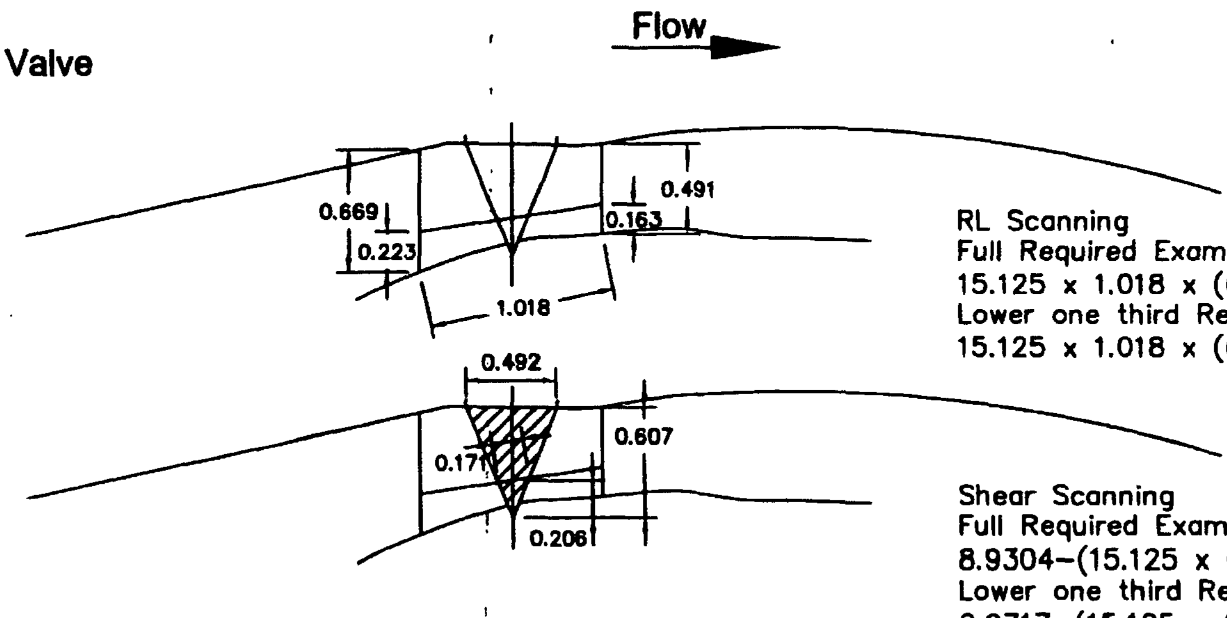
20	Shear Lower One Third Clockwise and CounterClockwise Scanning Obstructed exam Volume plus the area of exam that is not qualified by this procedure 15.125*((.171*.206)/2)=	0.2664
21	RL Axial Full Obtained Exam Volume from Elbow side ((Item 1)/2) - Item 9 =	3.1024
22	RL Axial Full Obtained Exam Volume from Valve side ((Item 1)/2) - Item 10 =	1.4334
23	RL Axial Lower One Third Obtained Exam Volume from the Elbow side ((Item 2)/2) - Item 11 =	1.0334
24	RL Axial Lower One Third Obtained Exam Volume from the Valve side ((Item 2)/2 - Item 12 =	0.4753
25	Shear Axial Full Obtained Exam Volume from Elbow side ((Item 3)/2) - Item 13 =	2.2067
26	Shear Axial Full Obtained Exam Volume from Valve side ((Item 3)/2) - Item 14 =	2.3194
27	Shear Axial Lower One Third Obtained Exam Volume from the Elbow side ((Item 4)/2) - Item 15 =	1.3526
28	Shear Axial Lower One Third Obtained Exam Volume from the Valve side ((Item 4)/2) - Item 16 =	0.6374
29	RL Full Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 5 - Item 17 =	4.4861
30	RL Lower One Third Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 6 - Item 18=	1.4928
31	Shear Full Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 7 - Item 19=	6.6719
32	Shear Lower One Third Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 8 - Item 20=	2.7053
33	RL Axial Full Exam Volume Percentage from Elbow side (Item 21/(((Item 1)/2)))*100 =%	69.48%
34	RL Axial Full Exam Volume Percentage from Valve side (Item 22/(((Item 1)/2)))*100 =%	32.10%
35	RL Axial Lower One Third Exam Volume Percentage from Elbow side (Item 23/(((Item 2)/2)))*100 =%	69.55%
36	RL Axial Lower One Third Exam Volume Percentage from Valve side (Item 24/(((Item 2)/2)))*100 =%	31.99%
37	Shear Axial Full Exam Volume Percentage from Elbow side (Item 25/(((Item 3)/2)))*100 =%	49.42%
38	Shear Axial Full Exam Volume Percentage from Valve side (Item 26/(((Item 3)/2)))*100 =%	51.94%
39	Shear Axial Lower One Third Exam Volume Percentage from Elbow side (Item 27/(((Item 4)/2)))*100 =%	91.04%
40	Shear Axial Lower One Third Exam Volume Percentage from Valve side (Item 28/(((Item 4)/2)))*100 =%	42.90%
41	RL Clockwise and CounterClockwise Full Exam Volume Percentage (Item 29/Item 5)*100=%	50.23%
42	RL Clockwise and CounterClockwise Lower One Third Exam Volume Percentage (Item 30/Item 6)*100=%	50.23%
43	Shear Clockwise and CounterClockwise Full Exam Volume Percentage (Item 31/Item 7)*100=%	74.71%
44	Shear Clockwise and CounterClockwise Lower One Third Exam Volume Percentage (Item 32/Item 8)*100=%	91.04%

45	Full Exam Volume Percentage combining Shear and RL in the Axial, Clockwise, and CounterClockwise Dircetions (Item 33 + Item 34 + Item 37 + Item 38 + Item 41 + Item 43)/6 =% 54.65%
46	Lower One Third Exam Volume Percentage combining Shear and RL in the Axial, Clockwise, and CounterClockwise Dircetions (Item 35 + Item 36 + Item 39 + Item 40 + Item 42 + Item 44)/6 =% 62.79%

COVERAGE PLOT Component ID: RCRD-2-49

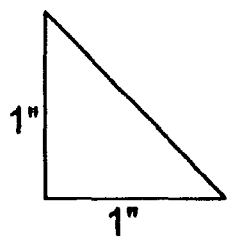
UT-13-013

Examiner: [signature]	Reviewer: [signature]	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 29 MAR 2013	Date: 4/18/13	Date:



RL Scanning
Full Required Exam Volume:
15.125 x 1.018 x ((.669+.491)/2) = 8.9304in³
Lower one third Required Exam Volume:
15.125 x 1.018 x ((.223+.163)/2) = 2.9717in³

Shear Scanning
Full Required Exam Volume:
8.9304−(15.125 x ((.492x.607)/2)) = 6.6719in³
Lower one third Required Exam Volume:
2.9717−(15.125 x ((.206x.171)/2)) = 2.7053in³



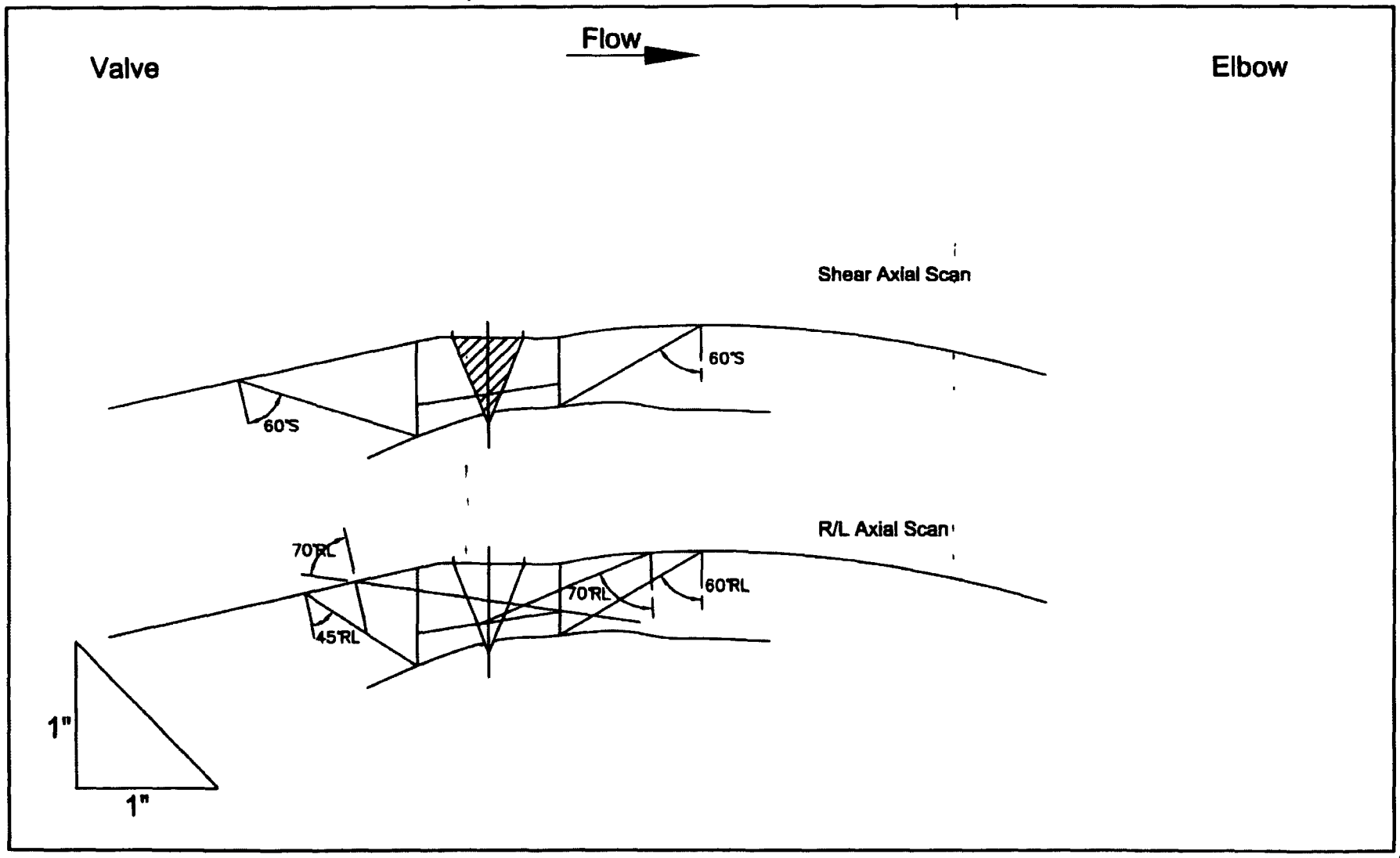
000118

PB 14/22

COVERAGE PLOT **Component ID:** RCRD-2-49

UT-13-013

Examiner:	Reviewer:	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 29 MAR 2013	Date: 4/18/13	Date:



0001119

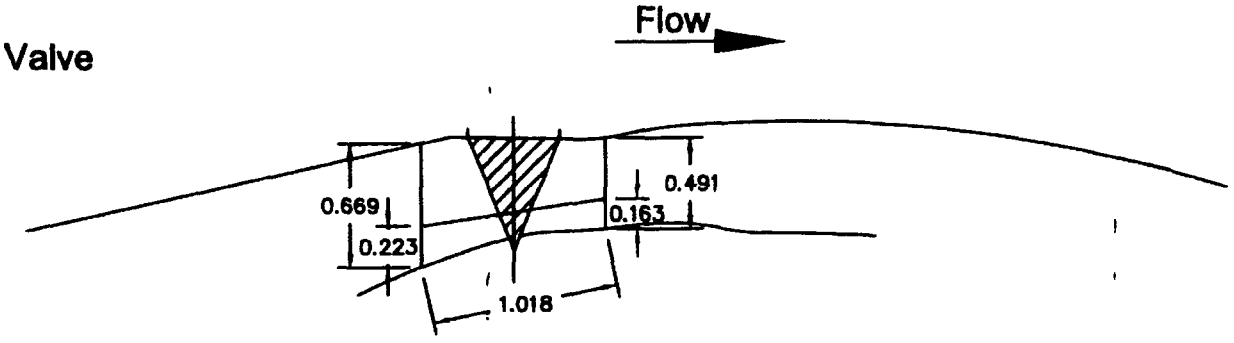
4/15/22

COVERAGE PLOT

Component ID: RCRD-2-49

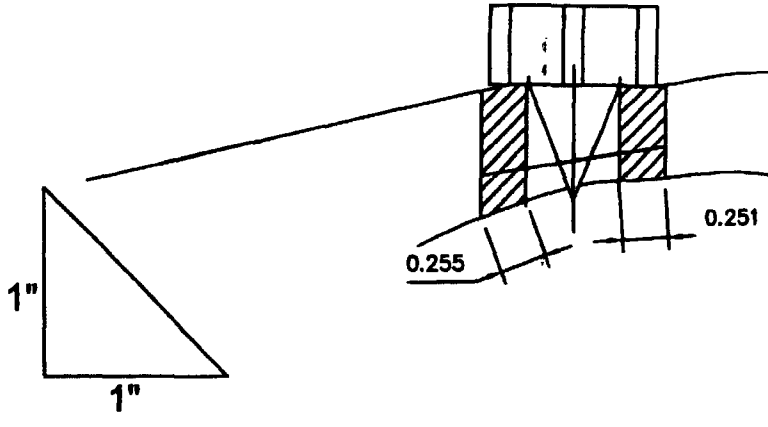
UT-13-013

Examiner:	Reviewer:	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 29 MAR 2013	Date: 4/18/13	Date:



Area of obstruction

Shear Clockwise and CounterClockwise Scanning
Full Exam Volume:
$15.125 \times 1.081 \times (.669 \times .491)/2)) = 8.9304 in^3$
Lower One Third Exam Volume:
$15.125 \times 1.081 \times ((.223 \times .163)/2) = 2.9717 in^3$



RL Clockwise and CounterClockwise Scanning
Full Obstucted Exam Volume:
$8.9304 - (15.125 \times ((.669 \times .255) + (.491 \times .251))) = 4.4861 in^3$
Lower One Third Obstucted Exam Volume:
$2.9717 - (15.125 \times ((.223 \times .255) + (.163 \times .251))) = 1.4928 in^3$

000120

8/16/22

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-024

(2 pages)

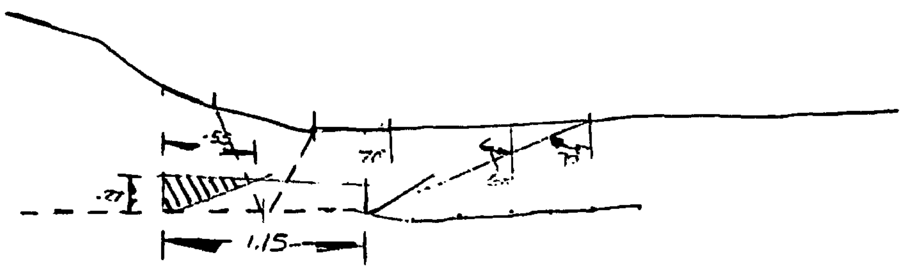
COVE[illegible]E PLOT

Component ID: CXV-2-005-003
UT-13-024

Examiner: D.R.[signature]	Reviewer: [signature]	ANII: N/A
Print name: DAVID KLEINMAN	Print name: MATT WELCH	Print name:
Date: 29 MAR 2013	Date: 4/4/13	Date:

VALVE

PIPE



[hatched box] OBSTRUCTED VOLUME AXIAL SCAN

REQUIRED EXAM VOLUME:

.27 X 1.15 X 14.875 = 4.6186875 in³

OBSTRUCTED LIMITED VOLUME

((.27 X .55)÷2) X 14.875 = 1.10446875 in³

OBTAINED EXAM VOLUME:

4.6186875 - 1.10446875 = 3.5142[illegible]

3.5142[illegible]875 ÷ 4.61868[illegible]5 X 100 = 76.09%

COMBINED COVERAGE = 76.09 + 65.15 = 141.24 ÷ 2 = 70.62%

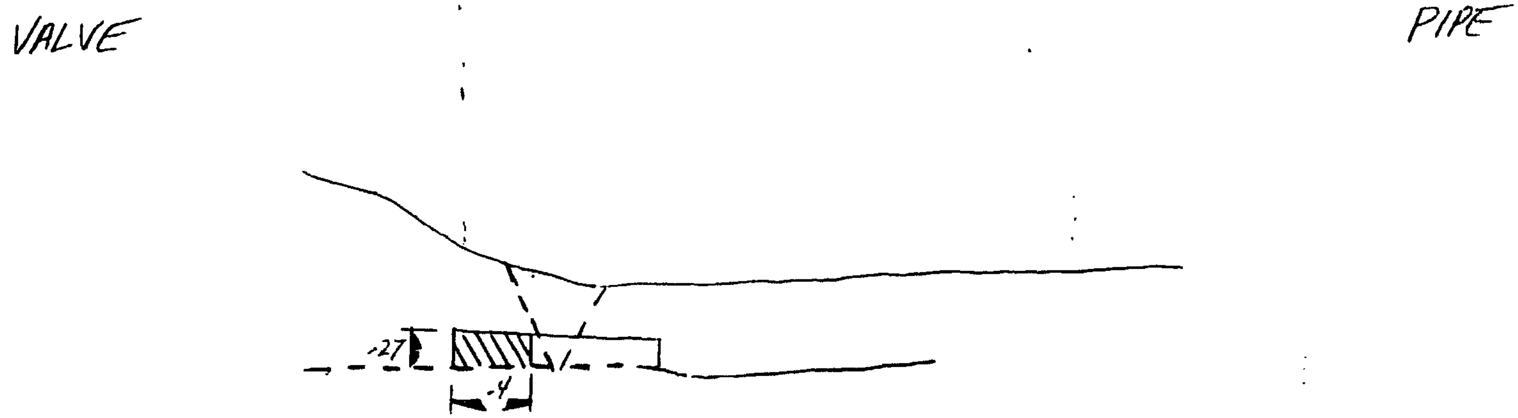
PS 10/13

000207

COVE GE PLOT **Component ID:** CRD-2-005-003

UT-13-024

Examiner: D.E. Kleinjan (signature)	Reviewer: Matt Welch (signature)	ANII: N/A
Print name: DAVID KLEINJAN	Print name: MATT WELCH	Print name:
Date: 29MAR2013	Date: 4/4/13	Date:



▧ OBSTRUCTED VOLUME CIRC

REQUIRED EXAM VOLUME:
.27 X 1.15 X 14.875 = 4.6186875 IN³

OBSTRUCTED/LIMITED VOLUME
.27 X .4 X 14.875 = 1.61 IN³

OBTAINED EXAM VOLUME:
4.6186875 − 1.61 = 3.01
3.01 ÷ 4.62 = 65.15%

DS 11/13

000238

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-044

(2 pages)

Ultrasonic Examination

000351

Site/Unit:	BFN / 2	Procedure:	N-UT-84	Outage No.:	U2RF17
Summary No.:	05507-ISI-BFN2	Procedure Rev.:	1	Report No.:	UT-13-044
Workscope:	ISI	Work Order No.:	2-SI-4.6.G	Page:	1 of 19 4/8/13

Code: ASME Section XI 2004 Edition Cat./Item: R-A/R1.16D Location: Reactor Building

Drawing No.: 2-ISI-0221-C-01 Description: VLV - FH

System ID: 074 - Residual Heat Removal System

Component ID: DRHR-2-03 Size/Length: N/A Thickness/Diameter: 1.219 / 24"

Limitations: Single Sided Exam

Comments:

This examination was performed using TVA ISO procedure N-UT-84, revision 1, titled " Procedure for the Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This procedure implements the processes and requirements of EPRI Report 1016650 which contains the procedure EPRI-PIPE-MPA-1, revision 0, titled "Procedure for Manual Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This examination was performed on a 24" diameter SS weld consisting of a Flued Head penetration to a cast stainless steel valve. The cast material limited the exam to single side access

The exam was performed to satisfy the requirements of Risk informed Category R-A, item R1.16D and Category D, item NU0313.

~~51.4%~~ coverage of the examination volume was achieved.

50%.

RAJ 2/5/14

Results: Accept ☑ Reject ☐ Info ☐ reference PER# 443133 4/10/13

Percent Of Coverage Obtained > 90%: 51.4 Reviewed Previous Data: Yes

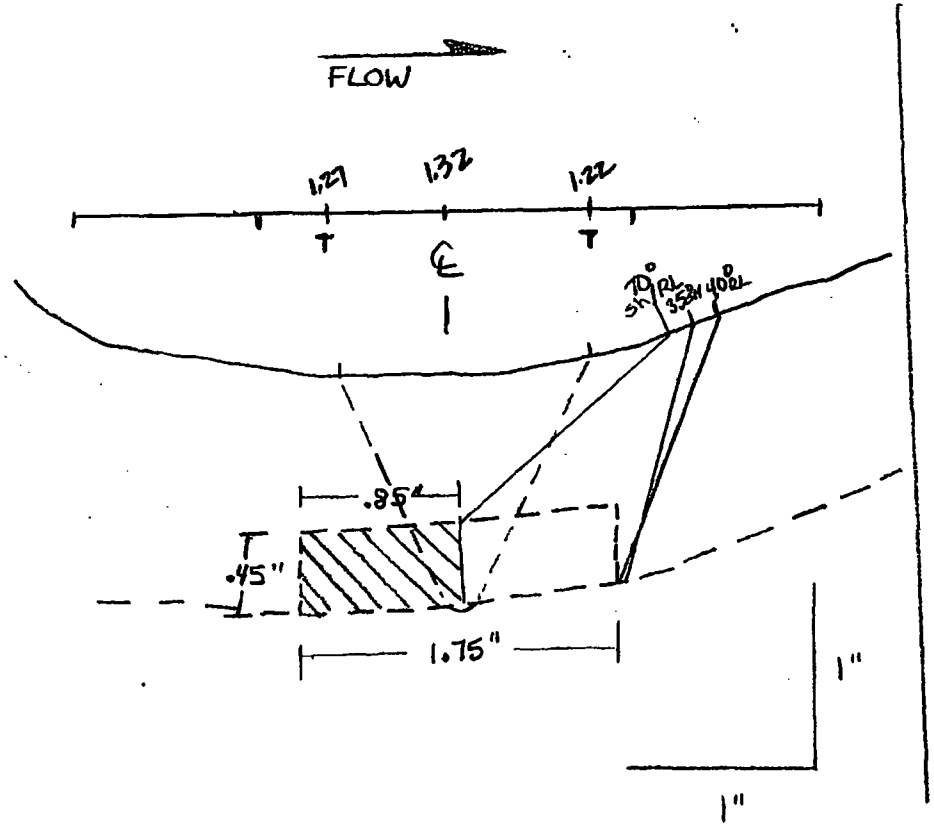
Examiner Gatica, James A.	Level II	Signature	Date 3/31/2013	Reviewer Matt Welch, LIII	Signature		Date 4/8/13
Examiner N/A	Level N/A	Signature	Date	Site Review N/A	Signature		Date
Other N/A	Level N/A	Signature	Date	ANII Review Samuel Flood	Signature		Date 4/17/13

COVE[illegible]GE PLOT

Component ID: DRHR-2-03
UT-13-044

Examiner:	Reviewer:	ANII:
Print name: JAMES GATICA	Print name: MATT WELCH	Print name: Samuel Flury
Date: 3/31/13	Date: 4/8/13	Date: 4/17/13

DRHR-2-03



VALVE

▨ OBSTRUCTED VOLUME

REQUIRED EXAM VOLUME:

1.75 x .45 x 75 = 59.0625

LIMITED VOLUME:

.85 x .45 x 75 = 28.6875

OBTAINED EXAM VOLUME

59.0625 - 28.687 = 30.3755

30.3755 / 59.0625 = .514 = ~~51.4%~~ 50% ~~RA 2/5/14~~

Cast value limits coverage to 50% RA Scab III 2/5/14 DS 8/9

C00361

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-072

(2 pages)

000453

Ultrasonic Examination

Site/Unit:	BFN / 2	Procedure:	N-UT-84 4/4/13	Outage No.:	U2RF17
Summary No.:	05499-ISI-BFN2	Procedure Rev.:	1	Report No.:	UT-13-072
Workscope:	ISI	Work Order No.:	2-SI-4.6.G	Page:	1 of 10

Code: Section XI 2004 Edition Cat./Item: R-A/R1.16C Location: Reactor Building - Drywell

Drawing No.: 2-ISI-0270-C-02 Description: P - TEE

System ID: 068 - Reactor Water Recirculating System

Component ID: KR-2-25 Size/Length: 28 / Thickness/Diameter: 1.322 / 28

Limitations: See Report

Comments:

This examination was performed using TVA ISO procedure N-UT-84, revision 1, titled "Procedure for the Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This procedure implements the processes and requirements of EPRI Report 1016650 which contains the procedure EPRI-PIPE-MPA-1, revision 0, titled "Procedure for Manual Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This examination was performed on a 28"diameter SS Pipe to Tee weld to satisfy the requirements of Risk Informed Category R-A, Item R1.16C and Category C, Item NU0313.

50% coverage of the examination volume was achieved.

No rejectable indications

Results: Accept ☑ Reject ☐ Info ☐

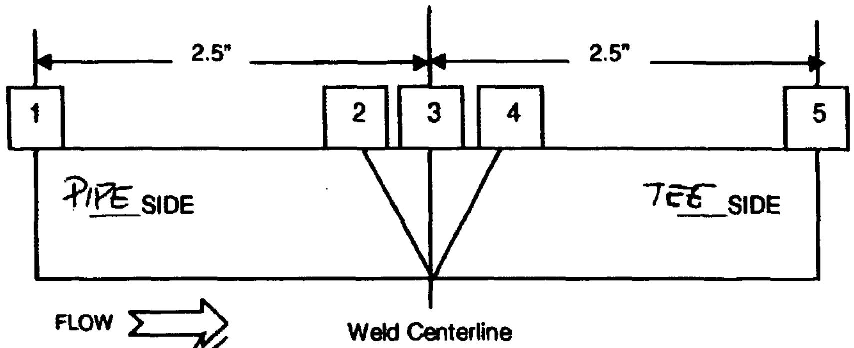
Percent Of Coverage Obtained > 90%: 50 Reviewed Previous Data: Yes

Examiner Kleinjan, Michael W.	Level III	Signature	Date 4/6/2013	Reviewer Matt Welch, LII		Signature	Date 4/9/13
Examiner Gatica, James A.	Level II	Signature	Date 4/6/2013	Site Review N/A		Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review MATTLOVELL		Signature	Date 4/16/13

THICKN[illegible] AND CONTOUR

Position	0	90	180	270
1	1.4			
2*	1.41	N		
3	1.43		A	
4*	N/A			
5	N/A			

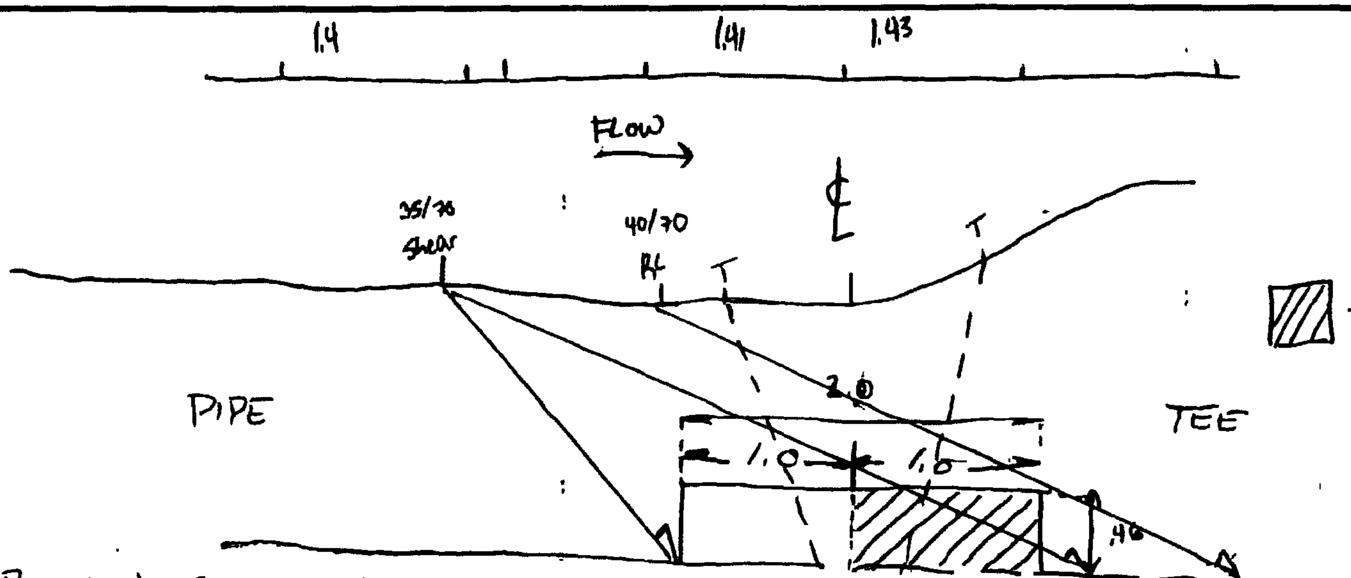
* Weld edge



UT-13-072

Examiner: [signature] 4/2/13	Reviewer: [signature] 4/9/13	ANII: [signature] 4/16/13
Print name: Mike Klempa Date:	Print name: MATT WELCH III Date:	Print name: MATT LOVELL Date:

COMPONENT ID: KR-2-25	
CROWN WIDTH: 2.0	WELD LENGTH: 88
CROWN HEIGHT: Flush	DIAMETER: 28



Shear Scan 3-5-6

RL Scan 3

▨ = Unscanned Area

Exam Limited Due To Tee Configuration

Required Exam Volumn

H- .46 x W- 2.0 x L- 88 = 80.96

Obtained Exam Volume = 50%

pg 8/10

Single Side Access No Circ Scan on Tee side, No Axail Scan on Tee side

0U0460

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-076

(4 pages)

Ultrasonic Examination

Site/Unit:	BFN / 2	Procedure:	N-UT-84 Rev 1	Outage No.:	U2RF17
Summary No.:	01859-ISI-BFN2	Procedure Rev.:	Rev 1	Report No.:	UT-13-076
Workscope:	ISI	Work Order No.:	2-SI-4.6.G	Page:	1 of 10

Code: Section XI 2004 Edition Cat./Item: R-A/R1.16D Location: Reactor Building - Drywell

Drawing No.: 2-ISI-0272-C-01 Description: P - P

System ID: 069 - Reactor Water Cleanup System

Component ID: RWCU-2-003-070 Size/Length: 6 / Thickness/Diameter: 0.432 / 6

Limitations: See Report

Comments:

This examination was performed using TVA ISO procedure N-UT-84, revision 1, titled "Procedure for the Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This procedure implements the processes and requirements of EPRI Report 1016650 which contains the procedure EPRI-PIPE-MPA-1, revision 0, titled "Procedure for Manual Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This examination was performed on a 6" diameter SS pipe to weld-o-let butt weld to satisfy the requirements of Risk Informed Category R-A, Item R1.16D and Category D, Item NU0313.

73.725%
~~73.6%~~ coverage of the examination volume was achieved.
4/14/13

No rejectable indications.

Results: Accept ☑ Reject ☐ Info ☐

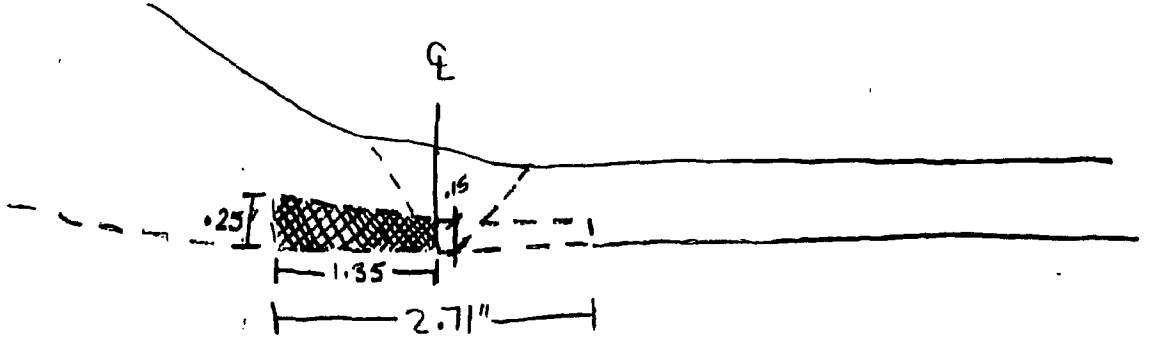
Percent Of Coverage Obtained > 90%: ~~73.6~~ 73.725% Yes Reviewed Previous Data: Yes

Examiner Gatica, James A.	Level II	Signature	Date 4/4/2013	Reviewer Matt Welch, LII	Signature	Date 4/9/13
Examiner N/A	Level N/A	Signature	Date	Site Review N/A	Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review MATT LOVELL	Signature	Date 4/10/13

INDIC ION PLOT **Component ID:** RWCU-2-003-070 LIT-13-076

Examiner:	Reviewer:	ANII:
Print name: JAMES GATTICA	Print name: MATT WELCH III	Print name: MATT LOVELL
Date: 4/4/13	Date: 4/9/13	Date: 4/19/13

LIMITATION DUE TO NON PARALLEL SURFACES ON TEE SIDE



CIRC SCAN LIMITATION:

$[((.25-.15)/2) \times 1.35] \times \frac{20.8}{14.9} = \cancel{4.023}\ 5.616$ ~~4/9/13~~ 4/19/13

CIRC OBTAINED VOLUME:

~~8.07-4.023=4.047/8.07=.5014=50%~~ ~~4/9/13~~

11.27 - 5.616 = 5.654 / 11.27 = .5017 = 50.2%

SCANS:

3) 94.4% 73.725%

4) 100% = ~~73.6~~% Coverage ~~4/9/13~~ 4/19/13

5) 50%

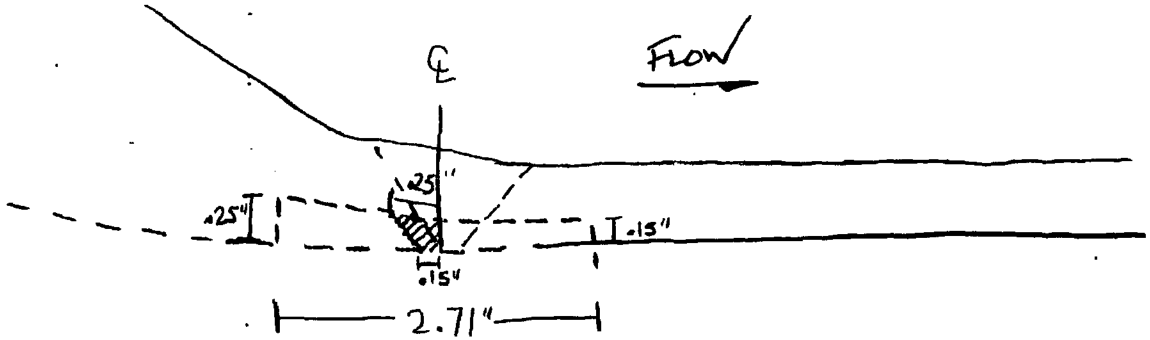
6) 50%

pg 8/10

COVE. GE PLOT

Component ID: RWCU-2-003-070 UT-13-076

Examiner: [signature]	Reviewer: [signature]	ANII: [signature]
Print name: JAMES GATICA	Print name: MATT WELCH III	Print name: MATT LOVELL
Date: 4/4/13	Date: 4/9/13	Date: 4/19/13



LIMITATION

[((.25+.15) / 2) x .15] x ~~14.9~~ 20.8 w 4/9/13 = ~~.447~~ .624 w 4/9/13

REQUIRED EXAM VOLUME

[((.25+.15)/2 x 2.71] x ~~14.9~~ 20.8 w 4/9/13 = ~~8.07~~ w 4/9/13 11.27 ^{3}IN

SHEAR OBTAINED VOLUME = 94.4%

~~8.07 - .447 = 7.6/8.07 = .944~~ w 4/9/13

11.27 - .627 = 10.65/11.27 = .9446 = 94.5%

PG 9/10

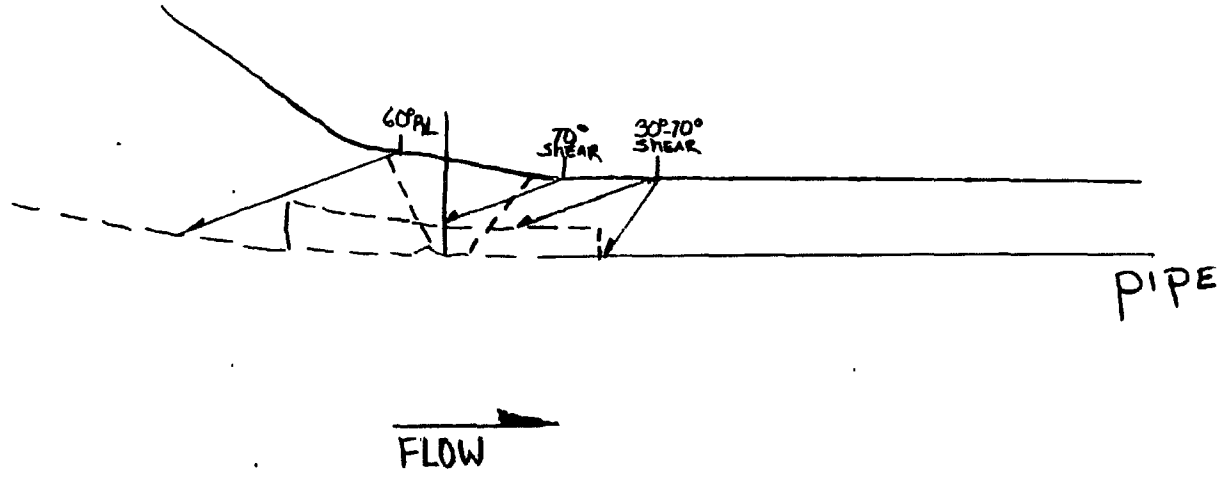
GG0486

COVE. ¦ ¦E PLOT

Component ID: RWCU-2-003-070

Examiner: [signature]	Reviewer: [signature]	ANII: [signature] LT-13-076
Print name: JAMES GATICA	Print name: MATT WELCH LIII	Print name: MATT LOVELL
Date: 4/4/13	Date: 4/9/13	Date: 4/19/13

RWCU-2-003-070



SINGLE SIDED COVERAGE pg 10/10

C00457

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-079

(3 pages)

Ultrasonic Examination

Site/Unit:	BFN / 2	Procedure:	N-UT-84	Outage No.:	U2RF17
Summary No.:	01507-ISI-BFN2	Procedure Rev.	1	Report No.:	UT-13-079
Workscope:	AUG	Work Order No.:	2-SI-4.6.G	Page:	1 of 11

Code: Section XI 2004 Edition Cat./Item: B-J/B9.11 Location: Reactor Building - Drywell

Drawing No.: 2-ISI-0221-C-01 Description: P - P

System ID: 074 - Residual Heat Removal System

Component ID: DRHR-2-09 Size/Length: 24 / Thickness/Diameter: 1.219 / 24

Limitations: See Attached Report

Comments:

This examination was performed using TVA ISO procedure N-UT-84, revision 1, titled "Procedure for the Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This procedure implements the processes and requirements of EPRI Report 1016650 which contains the procedure EPRI-PIPE-MPA-1, revision 0, titled "Procedure for Manual Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This examination was performed on a 24" diameter SS Pipe to Tee weld to satisfy the requirements of Category E, item NU0313.

This weld contains two previously recorded IGSCC flaws. Refer to UT sizing report UT-13-032 for additional data.

50% coverage of the examination volume was achieved.

Results: Accept ☑ Reject ☐ Info ☐

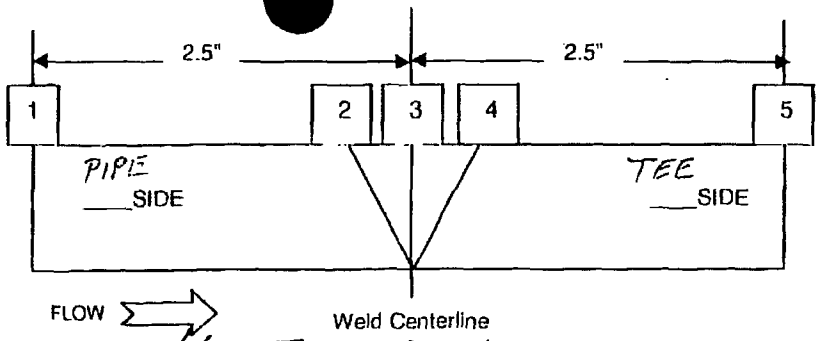
Percent Of Coverage Obtained > 90%: 50 Reviewed Previous Data: Yes

Examiner KLEINJAN, DAVID R	Level III*	Signature	Date 4/10/2013	Reviewer Matt Welch, LIII	Signature	Date 4/12/13
Examiner N/A	Level N/A	Signature	Date	Site Review N/A	Signature	Date
Other N/A	Level N/A	Signature	Date	ANII Review N/A	Signature	Date

THICKNESS AND CONTOUR

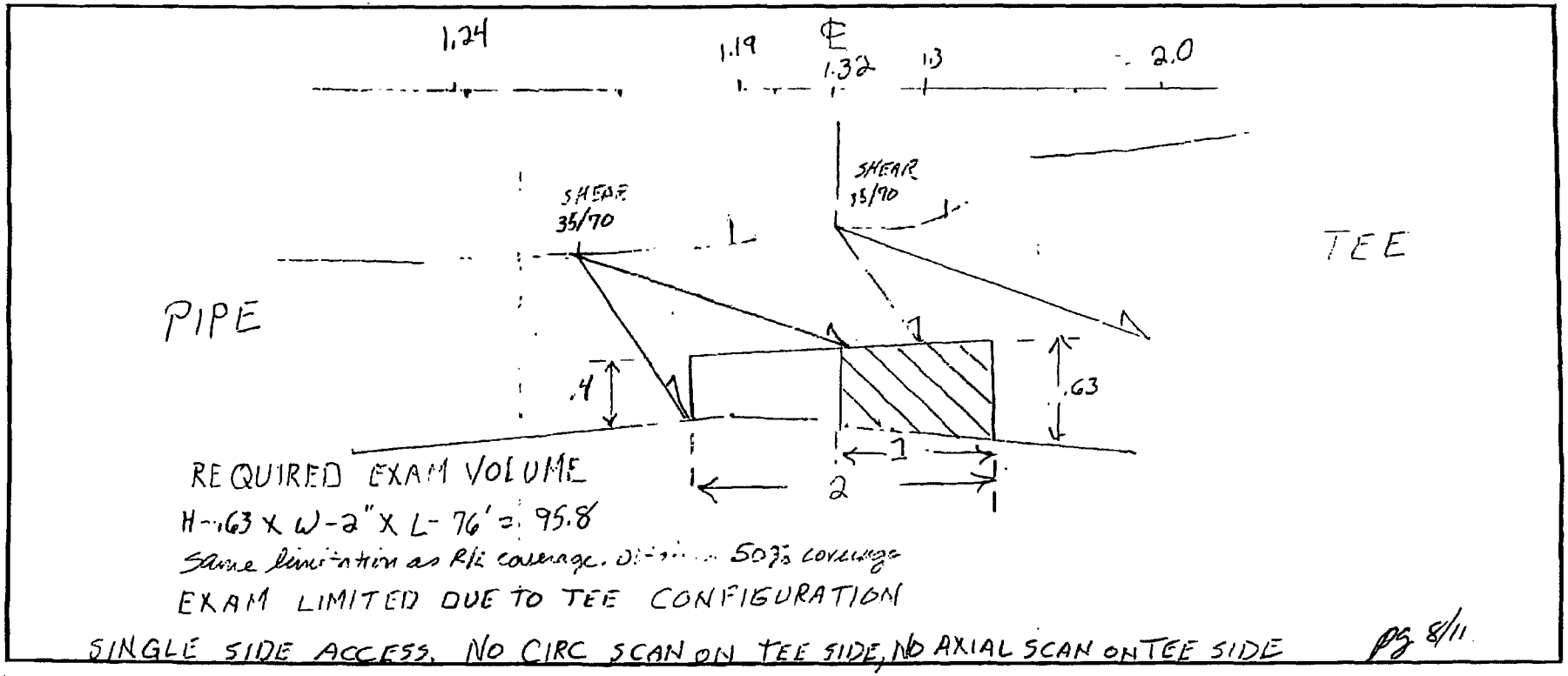
Position	0	90	180	270
1	1.24			
2*	1.19			
3	1.32			
4*	1.3			
5	2			

* Weld edge



UT-13-079

Examiner: D.R. Klee APRIL 10, 13	Reviewer: 4/12/13	ANII: N/A
Print name: DAVID KLEEMAN Date:	Print name: MATT WELCH Date:	Print name: Date:
COMPONENT ID: DRHR-2-09		
CROWN WIDTH: 1.5	WELD LENGTH: 76	
CROWN HEIGHT: 1/8	DIAMETER: 24	



REQUIRED EXAM VOLUME

H-.63 x W-2" x L-76" = 95.8

Same limitation as R/E coverage. [illegible] 50% coverage

EXAM LIMITED DUE TO TEE CONFIGURATION

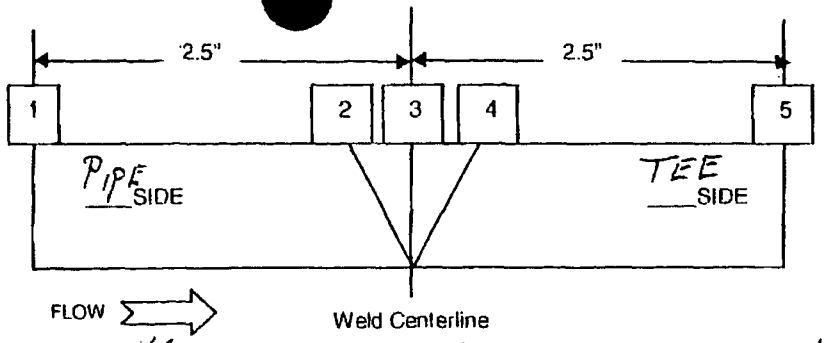
SINGLE SIDE ACCESS. NO CIRC SCAN ON TEE SIDE, NO AXIAL SCAN ON TEE SIDE

PS 8/11

THICKNESS AND CONTOUR

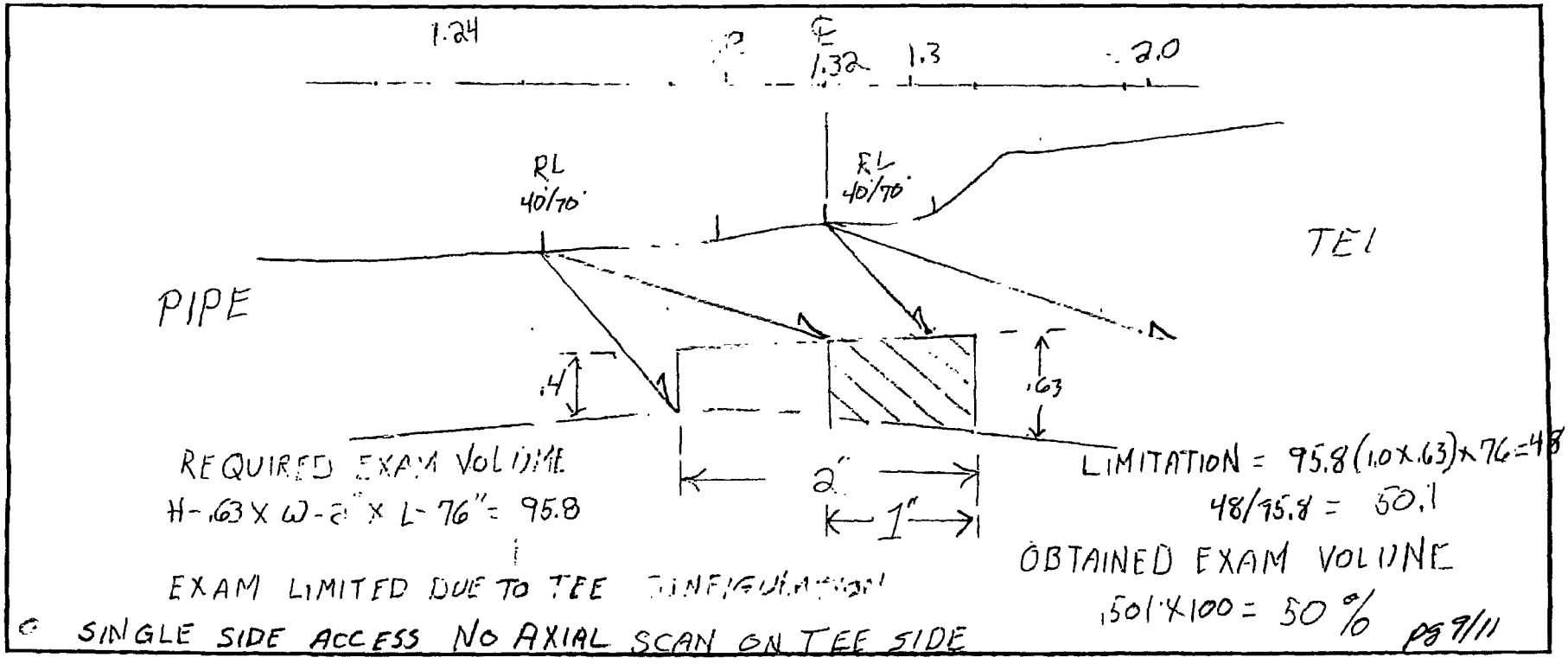
Position	0	90	180	270
1	1.24			
2*	1.19			
3	1.32			
4*	1.3			
5	2.0			

* Weld edge



UT-13-079

Examiner: [signature] APRIL 10,13	Reviewer: [signature] 4/12/13	ANII: N/A
Print name: DAVID KLEINJAN Date:	Print name: MATT WELCH Date:	Print name: Date:
COMPONENT ID: DRHR-2-09		
CROWN WIDTH: 1.5	WELD LENGTH: 76"	
CROWN HEIGHT: 1/8	DIAMETER: 24	



Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-080

(3 pages)

Ultrasonic Examination

Site/Unit:	BFN / 2	Procedure:	N-UT-84	Outage No.:	U2RF17
Summary No.:	01518-ISI-BFN2	Procedure Rev.:	1	Report No.:	UT-13-080
Workscope:	AUG	Work Order No.:	2-SI-4.6.G	Page:	1 of 11

Code: Section XI 2004 Edition Cat./Item: B-J/B9.11 Location: Reactor Building - Drywell

Drawing No.: 2-ISI-0221-C-01 Description: VLV - P

System ID: 074 - Residual Heat Removal System

Component ID: DRHR-2-22 Size/Length: 20 / Thickness/Diameter: 1.031 / 20

Limitations: See Attached Report

Comments:

This examination was performed using TVA ISO procedure N-UT-84, revision 1, titled "Procedure for the Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This procedure implements the processes and requirements of EPRI Report 1016650 which contains the procedure EPRI-PIPE-MPA-1, revision 0, titled "Procedure for Manual Phased Array Ultrasonic Examination of Austenitic and Ferritic Pipe Welds".

This examination was performed on a 24" diameter SS Pipe to Tee weld to satisfy the requirements of Category E, item NU0313.

This weld contains one previously recorded IGSCC flaws. Refer to UT sizing report UT-13-033 for additional data.

50% coverage of the examination volume was achieved.

Results: Accept ☑ Reject ☐ Info ☐

Percent Of Coverage Obtained > 90%. 50 Reviewed Previous Data: Yes

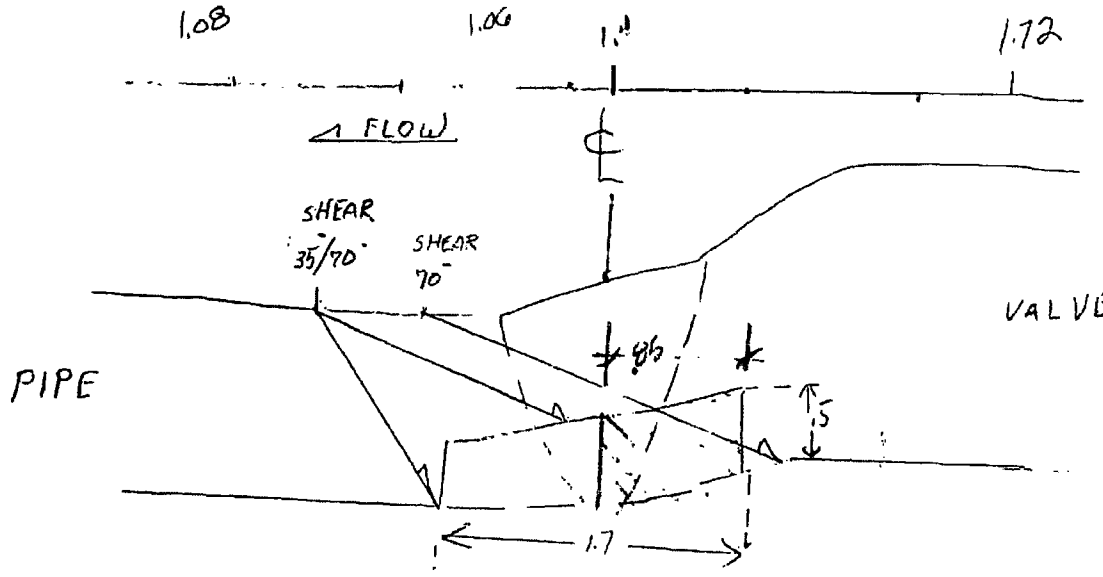
Examiner	Level III*	Signature	Date	Reviewer		Signature	Date
KLEINJAN, DAVID R		D.R. Kleinjan	4/9/2013	Matt Welch, LIII		Matt Welch	4/12/13
Examiner	Level N/A	Signature	Date	Site Review		Signature	Date
N/A				N/A			
Other	Level N/A	Signature	Date	ANII Review		Signature	Date
N/A				N/A			

[redacted]

COVERAGE PLOT

Component ID: DRHR-2-22
UT-13-080

Examiner: D. R. Klein	Reviewer: Matt Welch	ANII: N/A
Print name: DAVID KLEINJAN	Print name: MATT WELCH	Print name:
Date: 09 APR 2013	Date: 4/12/13	Date:



REQUIRED EXAM VOLUME

H - .5 x W - 1.7 x L - 62.8 = 53.38

SCAN
#3 0
#4 100
#5 50
#6 50 %
200 ÷ 4

SINGLE SIDE ACCESS DUE TO VALVE CONFIGURATION

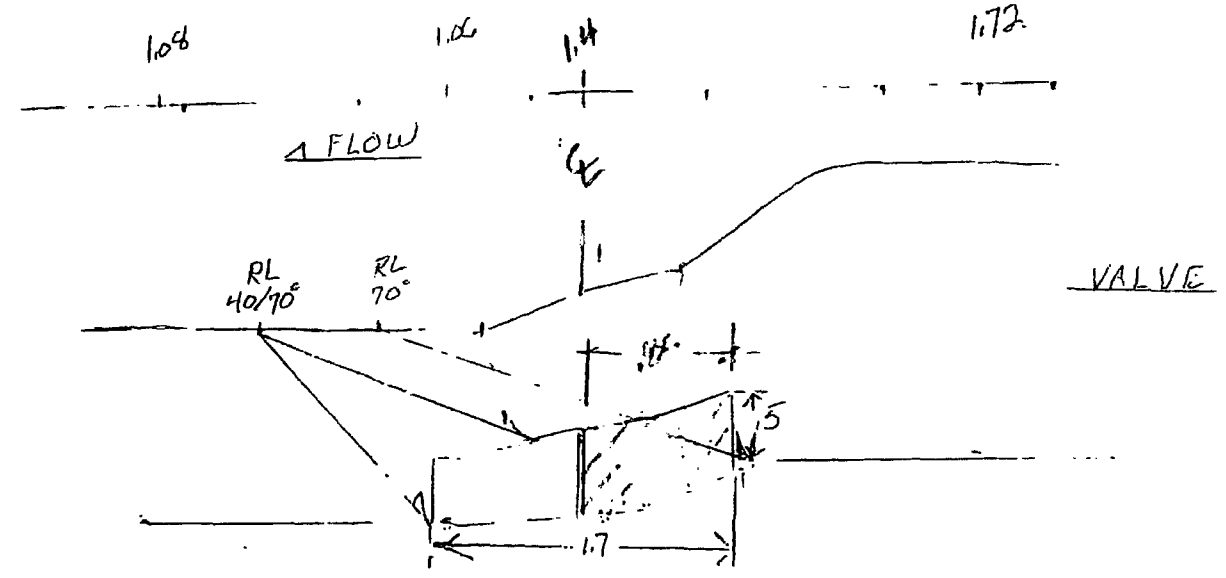
LIMITATION: 53.38 - ((.85x.5) x 62.8) = 27.1/53.38 = .507 COVERAGE OBTAINED SHEAR: 50%

PS 8/11

COVERAGE PLOT

Component ID: DRHR-2-22
UT-13-080

Examiner: J.R.B.	Reviewer: [signature]	ANII: N/A
Print name: Mike Kleinjan	Print name: MATT WELCH	Print name:
Date: APR 10 2013	Date: 4/12/13	Date:



REQUIRED EXAM VOLUME

H-.5 X W-1.7 X L-62.8 = 53.38

1"

1"

Same limitation as above - 50% coverage obtained

SINGLE SIDE ACCESS DUE TO VALVE CONFIGURATION

PS 9/11

Enclosure
Attachment B

TENNESSEE VALLEY AUTHORITY
Browns Ferry Nuclear Plant, Units 1, 2, and 3
Request for Relief ISI-44

Weld Inspection Report Excerpts

UT-13-086

(7 pages)

030570 -

UT-13086

PROJECT: BFN	UNIT: 2	CYCLE: 17
SYSTEM: Rector Water Cleanup System		Component: RCRD-2-50
Examiner: D.K. Kleinjan		Reviewer:
Print Name: David Kleinjan		Print Name: Matt Welch
Date: 05-Apr-13		Date: 4/19/13

4/19/13

Items #		
1	RL Axial Full Required Exam Volume 14.75*1.09*((0.332+0.828)/2)=	9.3250
2	RL Axial Lower One Third Required Exam Volume 14.75*1.09*((0.113+0.277)/2)=	3.1351
3	Shear Axial Full Required Exam Volume 14.75*1.09*((0.332+0.828)/2)=	9.3250
4	Shear Axial Lower One Third Required Exam Volume 14.75*1.09*((0.113+0.277)/2)=	3.1351
5	RL Full Clockwise and CounterClockwise Scanning Required exam Volume 14.75*1.09*((0.332+0.828)/2)=	9.3250
6	RL Lower One Third Clockwise and CounterClockwise Scanning Required exam Volume 14.75*1.09*((0.113+0.277)/2)=	3.1351
7	Shear Full Clockwise and CounterClockwise Scanning Required exam Volume 14.75*1.09*((0.332+0.828)/2)=	9.3250
8	Shear Lower One Third Clockwise and CounterClockwise Scanning Required exam Volume 14.75*1.09*((0.113+0.277)/2)=	3.1351
9	RL Axial Full Volume Obstructed Exam from the Elbow side (1.09/2)*5.0125*((0.332+0.561)/2)=	1.2198
10	RL Axial Full Volume Obstructed Exam from the Valve side (1.090/2)*(2.7948*3)*((0.561+0.828)/2)=	3.1735
11	RL Axial Lower One Third Volume Obstructed Exam from the Elbow side (1.090/2)*5.0*((0.277+0.113)/2)=	0.5314
12	RL Axial Lower One Third Volume Obstructed Exam from the Valve side (1.090/2)*(2.7948*3)*0.277=	1.2658
13	Shear Axial Full Volume Obstructed Exam plus the area that is not qualified by this procedure from the Elbow side 14.75*(((0.563*0.561)/2)/2)=	1.1647
14	Shear Axial Full Volume Obstructed Exam plus the area that is not qualified by this procedure from the Valve side (14.75*(((0.563*0.561)/2)/2)+((1.090/2)*(1.9781*3)*0.277)-(((0.149*0.300)/2)*(1.9781*3))=	1.9279
15	Shear Axial Lower One Third Volume Obstructed Exam plus the area of exam that is not qualified by this procedure from the Elbow side 14.75*(((0.298*0.300)/2)/2)=	0.3297
16	Shear Axial Lower One Third Volume Obstructed Exam plus the area of exam that is not qualified by this procedure from the Valve side 14.75*(((0.298*0.300)/2)/2)+((1.090/2)*(1.9781*3)*0.277)=	0.8485
17	RL Full Clockwise and CounterClockwise Scanning Obstructed exam Volume 14.75*0.388*((0.828+0.561)/2)=	3.9746
18	RL Lower One Third Volume Clockwise and CounterClockwise Scanning Obstructed exam Volume 14.75*0.388*0.277=	1.5853
19	Shear Full Clockwise and CounterClockwise Scanning Obstructed exam Volume plus the area of exam that is not qualified by this procedure 14.75*((0.563*0.561)/2)=	2.3293

20	Shear Lower One Third Clockwise and CounterClockwise Scanning Obstructed exam Volume plus the area of exam that is not qualified by this procedure 14.75*((0.298*0.300)/2)=	0.6593
21	RL Axial Full Obtained Exam Volume from Elbow side ((Item 1)/2) - Item 9 =	3.4427
22	RL Axial Full Obtained Exam Volume from Valve side ((Item 1)/2) - Item 10 =	1.4890
23	RL Axial Lower One Third Obtained Exam Volume from the Elbow side ((Item 2)/2) - Item 11 =	1.0362
24	RL Axial Lower One Third Obtained Exam Volume from the Valve side ((Item 2)/2 - Item 12 =	0.3018
25	Shear Axial Full Obtained Exam Volume from Elbow side ((Item 3)/2) - Item 13 =	3.4978
26	Shear Axial Full Obtained Exam Volume from Valve side ((Item 3)/2) - Item 14 =	2.7346
27	Shear Axial Lower One Third Obtained Exam Volume from the Elbow side ((Item 4)/2) - Item 15 =	1.2379
28	Shear Axial Lower One Third Obtained Exam Volume from the Valve side ((Item 4)/2) - Item 16 =	0.7191
29	RL Full Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 5 - Item 17 =	5.3503
30	RL Lower One Third Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 6 - Item 18=	1.5498
31	Shear Full Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 7 - Item 19=	6.9956
32	Shear Lower One Third Clockwise and CounterClockwise Scanning Obtained Exam Volume Item 8 - Item 20=	2.4758
33	RL Axial Full Exam Volume Percentage from Elbow side (Item 21/(((Item 1)/2)))*100 =%	73.84%
34	RL Axial Full Exam Volume Percentage from Valve side (Item 22/(((Item 1)/2)))*100 =%	31.93%
35	RL Axial Lower One Third Exam Volume Percentage from Elbow side (Item 23/(((Item 2)/2)))*100 =%	66.10%
36	RL Axial Lower One Third Exam Volume Percentage from Valve side (Item 24/(((Item 2)/2)))*100 =%	19.25%
37	Shear Axial Full Exam Volume Percentage from Elbow side (Item 25/(((Item 3)/2)))*100 =%	75.02%
38	Shear Axial Full Exam Volume Percentage from Valve side (Item 26/(((Item 3)/2)))*100 =%	58.65%
39	Shear Axial Lower One Third Exam Volume Percentage from Elbow side (Item 27/(((Item 4)/2)))*100 =%	78.97%
40	Shear Axial Lower One Third Exam Volume Percentage from Valve side (Item 28/(((Item 4)/2)))*100 =%	45.87%
41	RL Clockwise and CounterClockwise Full Exam Volume Percentage (Item 29/Item 5)*100=%	57.38%
42	RL Clockwise and CounterClockwise Lower One Third Exam Volume Percentage (Item 30/Item 6)*100=%	49.43%
43	Shear Clockwise and CounterClockwise Full Exam Volume Percentage (Item 31/Item 7)*100=%	75.02%
44	Shear Clockwise and CounterClockwise Lower One Third Exam Volume Percentage (Item 32/Item 8)*100=%	78.97%

45	Full Exam Volume Percentage combining Shear and RL in the Axial, Clockwise, and CounterClockwise Dircetions (Item 33 + Item 34 + Item 37 + Item 38 + Item 41 + Item 43)/6 =% 61.97%
46	Lower One Third Exam Volume Percentage combining Shear and RL in the Axial, Clockwise, and CounterClockwise Dircetions (Item 35 + Item 36 + Item 39 + Item 40 + Item 42 + Item 44)/6 =% 56.43%

COVERAGE PLOT **Component ID:** RCRD-2-50

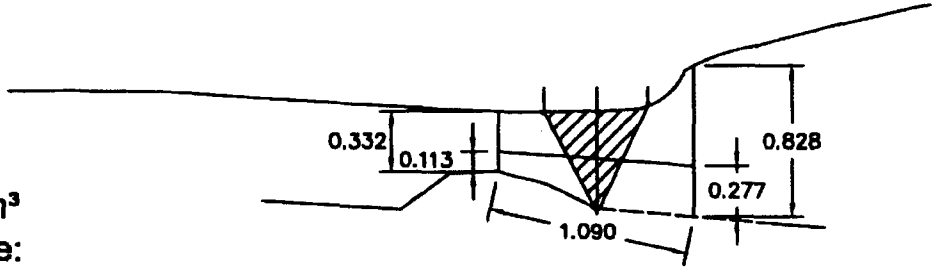
UT-13-086

Examiner: D. Kleinjan	Reviewer:	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 05 APR 2013	Date: 4/19/13	Date:

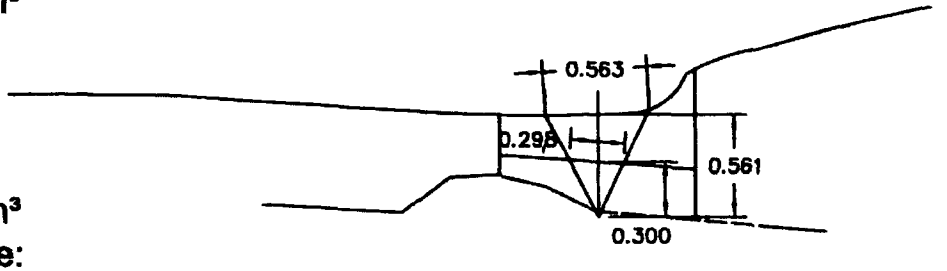
Flow →

Elbow

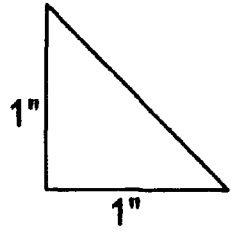
Valve



Shear Axial Scanning
Full Required Exam Volume:
14.75 x 1.090 x ((.332+.828)/2)=9.3250in³
Lower One Third Required Exam Volume:
14.75 x 1.090 x ((.113+.277)/2)=3.1351in³



RL Axial Scanning
Full Required Exam Volume:
14.75 x 1.090 x ((.332+.828)/2)=9.3250in³
Lower One Third Required Exam Volume:
14.75 x 1.090 x ((.113+.277)/2)=3.1351in³



000573

PS 12/19

COVERAGE PLOT **Component ID:** RCRD-2-50

UT-13-086

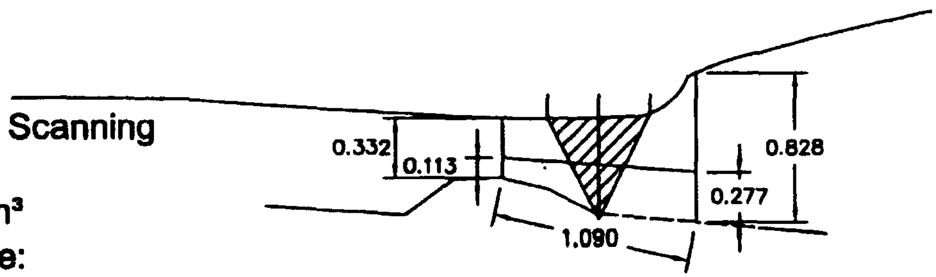
Examiner: [signature]	Reviewer: [signature]	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 05 APR 2013	Date: 4/19/13	Date:

Elbow

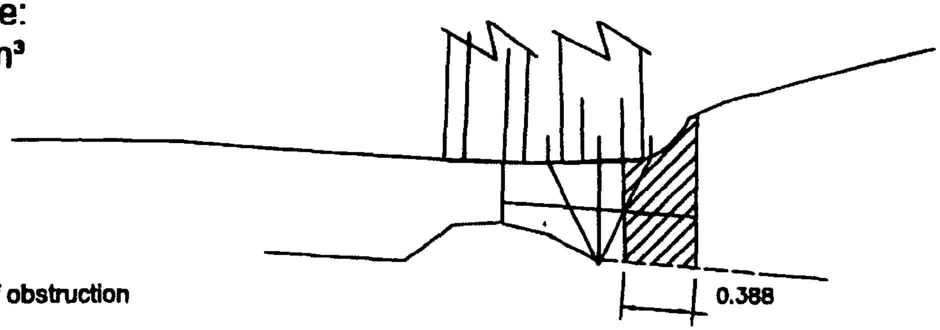
Flow →

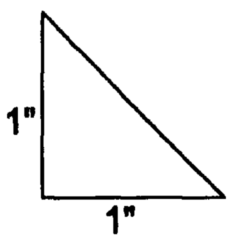
Valve

Shear Clockwise and CounterClockwise Scanning
Full Required Exam Volume:
14.75 x 1.090 x ((.332+.828)/2)=9.3250in³
Lower One Third Required Exam Volume:
14.75 x 1.090 x ((.113+.277)/2)=3.1351in³



RL Clockwise and CounterClockwise Scanning
Full Required Exam Volume:
14.75 x 1.090 x ((.332+.828)/2)=9.3250in³
Lower One Third Required Exam Volume:
14.75 x 1.090 x ((.113+.277)/2)=3.1351in³





 Area of obstruction

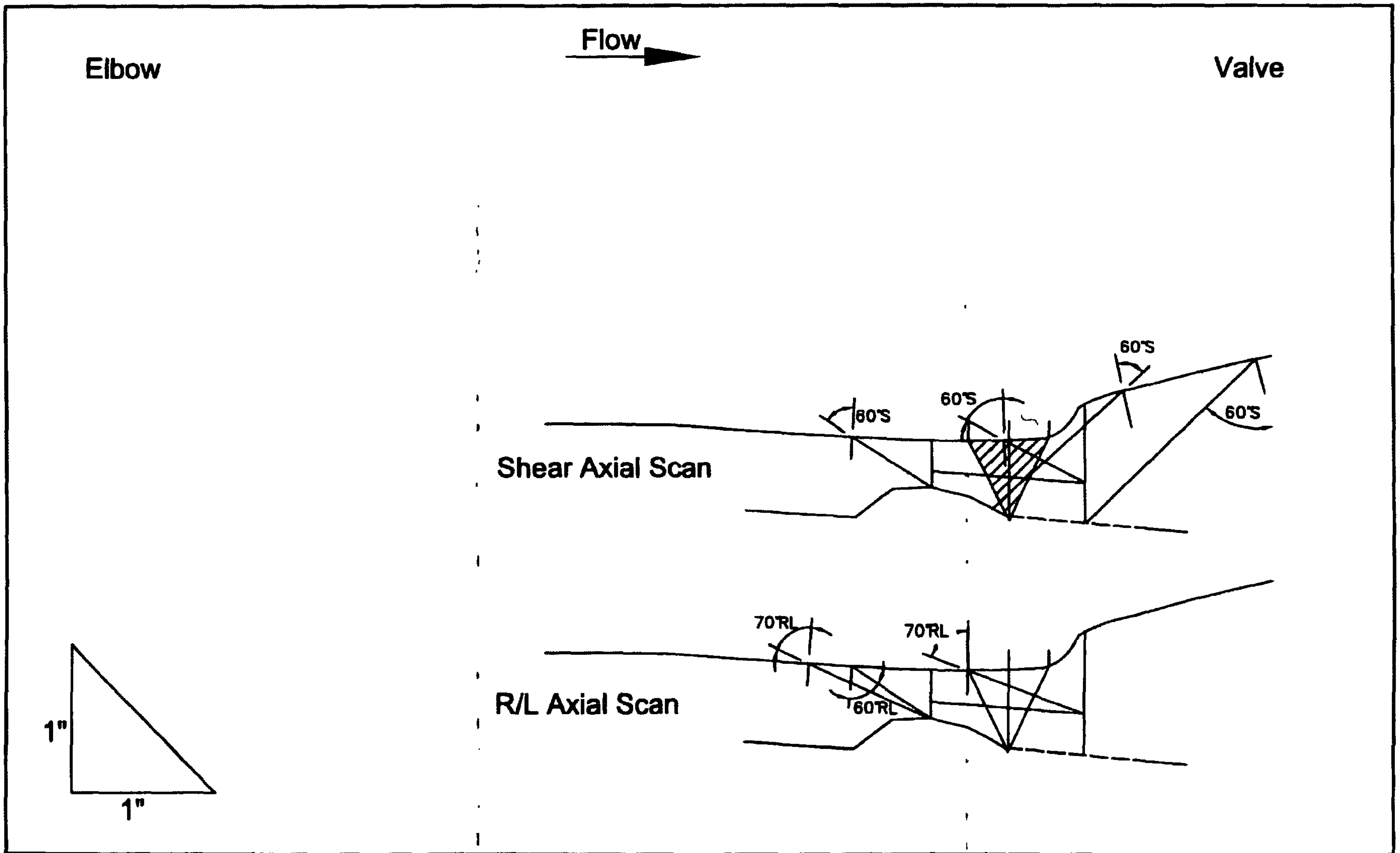
000571

pg 13/19

COVERAGE PLOT **Component ID:** RCRD-2-50

UT-13-086

Examiner: [signature]	Reviewer: [signature]	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 05 APR 2013	Date: 4/19/13	Date:

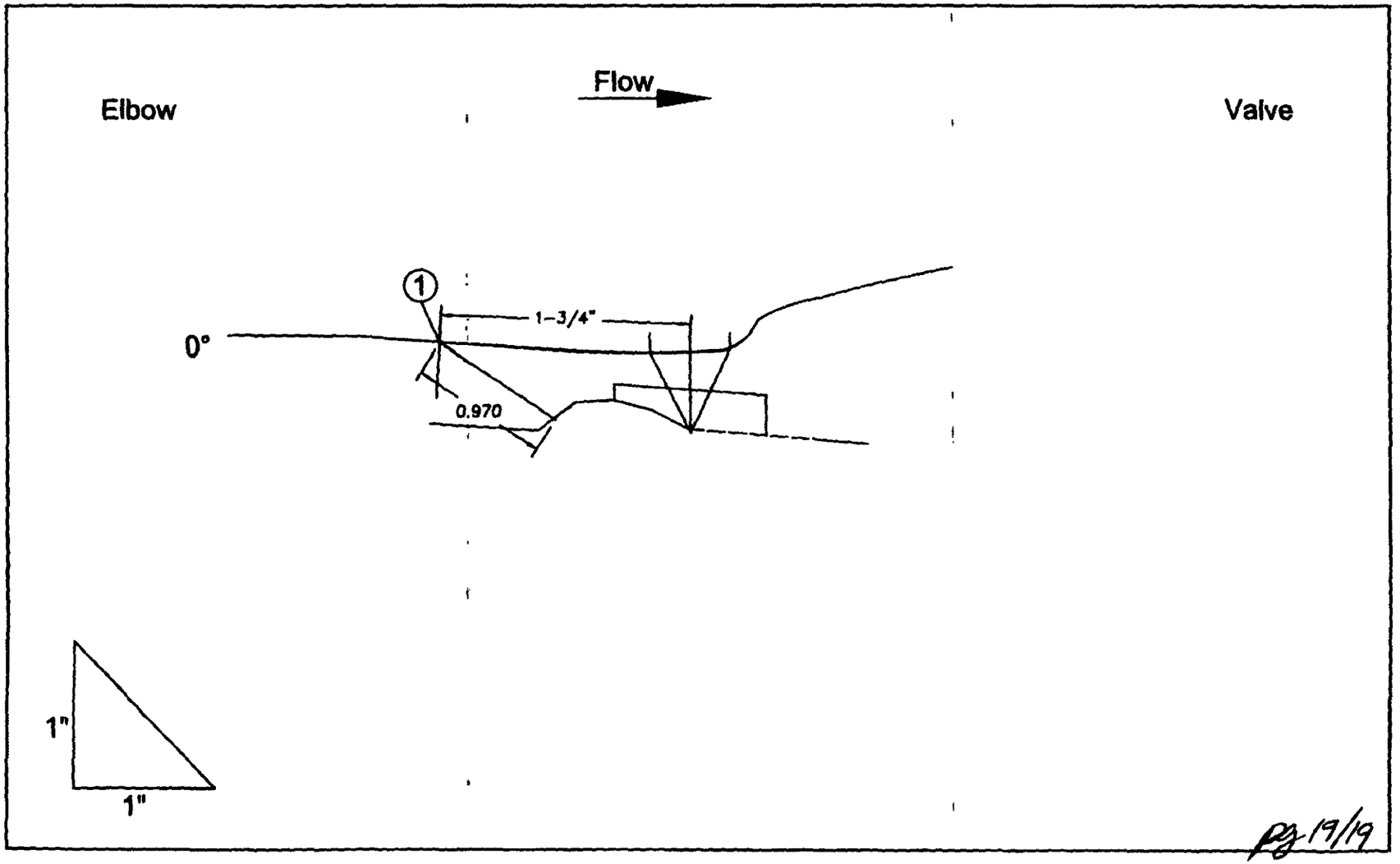


ps 14/19

INDICATION PLOT **Component ID:** RCRD-2-50

UT-13-086

Examiner: D.R. Kleinjan	Reviewer: Matt Welch	ANII: N/A
Print name: David Kleinjan	Print name: Matt Welch	Print name:
Date: 05 APR 2013	Date: 4/19/13	Date:



4/19/13

C00580