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1	HNF-4818	N/A	0	Final Results of Double-	E	1	1	
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16. KEY

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Final Results of Double-Shell Tank 241-AY-102 Ultrasonic Inspection

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U.S. Department of Energy Contract DE-AC06-87RL10930

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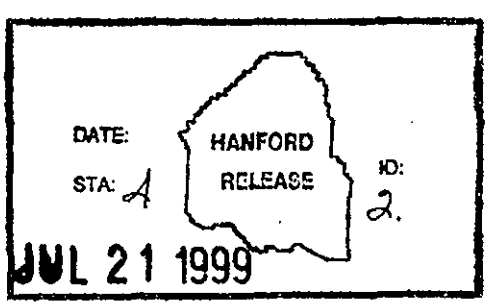
Key Words: ultrasonic, tank integrity, examination, 241-AY-102, 102-AY, inspection, wall thinning, UT testing, tank wall, UT, integrity assessment, ultrasonic inspection

Abstract: This document presents the results and documentation of the nondestructive ultrasonic examination of tank 241-AY-102. A tank inspection supplier was retained to provide and use an ultrasonic examination system (equipment, procedures, and inspectors) to scan a limited area of double-shell tank 241-AY-102 primary tank wall and welds. The inspection found some indication of insignificant general and local wall thinning with no cracks detected.

Release Approval 7/21/99 Date Release Stamp



Approved for Public Release

FINAL RESULTS OF DOUBLE-SHELL TANK 241-AY-102 ULTRASONIC INSPECTION

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COGEMA Engineering Corporation

Final Results of Double-Shell Tank 241-AY-102 Ultrasonic Inspection

July 13, 1999

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Lockheed Martin Hanford Corporation
Richland, Washington

Final Results of Double-Shell Tank 241-AY-102 Ultrasonic Inspection

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Double-Shell Tank System Integrity Assessment: FINAL RESULTS OF DOUBLE-SHELL TANK 241-AY-102 ULTRASONIC INSPECTION

1.0 INTRODUCTION

In May 1996, the Tank Waste Remediation System (TWRS) Decision Board recommended, and the U.S. Department of Energy-Richland Operations Office (DOE-RL) agreed, that the condition of the double-shell tanks (DST) should be determined by ultrasonic (UT) inspection of a limited area in six of the 28 DSTs. The Washington State Department of Ecology (WDOE) has agreed with the strategy of limited UT inspection of six DSTs. Data collected during the UT inspections will be used to assess the condition of the tanks, judge the effects of past corrosion control practices, and satisfy a regulatory requirement to periodically assess the integrity of waste tanks.

In November 1996, the primary and secondary walls of DST 241-AW-103 were remotely examined to determine if Hanford DST walls could be inspected without removing the existing surface rust and scale. The successful completion of this inspection represented the first UT inspection of a Hanford DST (Leshikar 1997).

Based on the results of the initial inspection, a statement of work (SOW)(Pfluger 1999) was prepared for the remaining DST inspections scheduled for Fiscal Year (FY) 1999. The service of COGEMA Engineering Corporation (COGEMA Engineering) was retained to provide an UT examination system (equipment, procedures, and inspectors) and perform the inspection.

Tank 241-AY-102 was selected as one of the six sample tanks that represent the complete 28-tank population. The tank began receiving waste in 1976 and is currently classified as a dilute waste tank (DN). The current tank level is approximately 185 inches (Hanlon 1999). From 1976 to present, the waste temperature in the tank has not exceeded 123°F with the average temperature holding at approximately 68°F. Although the tanks are expected to have similar performance, the selection of tanks is purposely biased towards tanks whose primary walls may be more likely to be degraded by corrosion. The tank selection criteria (Schwenk and Scott 1996) considered variables that may influence corrosion, such as waste physical characteristics, waste chemistry, temperature, and age. Tank 241-AY-102 was chosen because it is older, had significant waste height fluctuations, and the material of construction is more conducive to cracking in the knuckle region.

2.0 OBJECTIVE / SCOPE

This report presents the results of the UT examination of DST 241-AY-102 with attention focused on the primary tank wall base metal and welds. Issuance of this report meets FY 1999 Performance Agreement TWR 6.3.1. The criteria, deliverables, and responsibilities for the UT examination are described in Pfluger 1999.

3.0 EXAMINATION EQUIPMENT DESCRIPTION

P-scan – P-scan is the name of the computerized pulse-echo UT inspection system used by the examination vendor. The P-scan system is manufactured by Force Institute in Denmark. It acquires data from zero and angle beam transducers mounted on the crawler, allows real-time analysis, and records the data in electronic memory for post inspection analysis. Force Institute has designated "P-scan mode" to represent the angle beam (flaw length) view and "T-scan mode" to represent the zero beam (thickness) view. T-scan mode is used for normal operation and, if crack-like indications are detected, the P-scan mode is employed. More information on the procedure for the P-scan system is found in Jensen 1999.

Crawler (UT Scanner) – The crawler is a remotely-controlled device that delivers the ultrasonic sensors to the tank walls (Figure 2). It weighs approximately 30 pounds and has dimensions of approximately 21" wide x 18" long x 6" high. The crawler attaches to the tank wall with two pairs of magnetic wheels. A traveling bridge on the crawler is outfitted with ultrasonic sensors. As the crawler moves slowly forward, the sensors glide from side-to-side over the tank wall surface. Water couplant is continuously fed to each transducer at a rate needed to maintain an acceptable signal.

Overview Camera – This camera was deployed to observe the area immediately around the inspection area and to aid crawler deployment in the annulus.

Sideview Camera – This camera and light system were installed in a riser adjacent to the inspection riser to provide an overall view of the inspection process.

Data Acquisition Control Center – A pull-type trailer was used to house the crawler controls, video monitors, and the data collection and evaluation hardware. The trailer was located outside the AY tank farm boundary fence (Figure 2).

Deployment Tool – This device was specifically designed to insert and retrieve the scanner from the DST annular space. The scanner sits on a platform that is manually lowered to the appropriate elevation. That platform has cables attached that can be controlled to move the scanner platform into contact with the examination surface. The scanner is then driven onto the surface. The deployment tool is retracted until scanner removal is required.

4.0 PERFORMANCE DEMONSTRATION TESTS

Prior to field use, COGEMA Engineering's UT examination system satisfactorily completed a performance demonstration test (PDT). The test was performed prior to examination of tank 241-AN-107 in FY 1998 (Pfluger 1998). The test was conducted to qualify personnel, test procedures, and ensure the equipment's ability to detect and size wall thinning, pits, and cracks in a series of test plates with artificial and natural defects. The PDT was performed on an actual tank mockup located in the 306E facility located in the Hanford site 300 area. This mockup also demonstrated the successful deployment and retrieval of the equipment. Pacific Northwest National Laboratory report (Attachment 1) PNNL-12233 *Ultrasonic Examination of Double-Shell Tank 241-AY-102* provides details of the complete examination and brief evaluation of the PDT.

5.0 ULTRASONIC EXAMINATION DESCRIPTION

5.1 Primary Wall and Weld Inspection

The tank inspection was performed under Job Control System (JCS) work package 2E-98-02406/W during early calendar year 1999. All work steps, guidelines, procedures, personnel responsibilities, and protocol for the inspection (Pfluger 1999) were included in the subject work package.

An updated version of the remotely-controlled, steerable crawler was used to deliver the UT sensors to the tank wall. The crawler was deployed through a 24-inch annulus inspection riser number 18B. The crawler attached to the tank wall with two pairs of magnetic wheels. A traveling bridge on the crawler was outfitted with UT sensors. As the crawler moved slowly forward, the sensors glided from side-to-side over the inspection surface. Water couplant was continuously fed to each transducer at a rate needed to attain an acceptable signal. For examination of the wall, one dual element 0° transducer and two 45° shear wave transducers were used. To detect cracks perpendicular to welds, two opposing 45° shear wave transducers were directed parallel to the weld. To detect cracks parallel to the weld, a 60° shear-wave transducer was directed toward the weld and a dual element 0° transducer was also included. Welds were examined from both sides of the weld crown.

Data and images from both systems were returned to a control center located just outside the AY tank farm fence (Figure 2). The control center housed the crawler controls, video monitors, and data collection and evaluation software/hardware. The UT inspector continuously monitored the signal for reportable indications. The inspection was viewed by a camera and lighting system deployed in an adjacent riser.

6.0 GENERAL REQUIREMENTS AND INSPECTION CRITERIA

The FY 1999 Performance Agreement TWR 6.3.1 is stated below:

"The contractor shall perform ultrasonic examination of four double-shell tanks (primary walls straight portion) to the extent described in HNF-2820, *"Engineering Task Plan for the Ultrasonic Inspection of Hanford Double-Shell Tanks"*. Completion is met when ultrasonic examination on four double-shell tanks is performed, a report of examinations/observations is reviewed and approved by FDH, and the report is submitted to RL by July 31, 1999. The report shall include the extent of the examination, discussion of observations, findings, and conclusions."

Areas to be examined on the primary tank were identified in the SOW (Pfluger 1999) as:

Primary Tank Wall:

- A vertical strip, approximately 30 inches wide by 35 feet long. The vertical strip may be comprised of one or more strips whose total width is approximately 30 inches. (The distance from the tank upper haunch transition to the lower knuckle is approximately 35 feet).
- 20 feet of the cylinder-to-lower knuckle weld.
- One vertical weld joining the lowest shell course plates (approximately 10 feet).
- One vertical weld joining the next to the lowest shell course plates (approximately 10 feet).

7.0 INDICATION REPORTING CRITERIA

COGEMA Engineering was required to report to the customer the following anomalies (Pfluger 1999):

- Wall thinning that exceeded 10% of the nominal plate thickness
- Pit depths that exceeded 25% of the nominal wall thickness
- Cracks that exceeded 0.18 inches in depth.

8.0 EQUIPMENT SET-UP AT AY TANK FARM

Prior to performing the actual examination, the riser shield plug was removed and replaced with a sheetmetal cover.

A temporary structure, constructed of scaffolding, was erected around the riser to provide the means for deploying the UT equipment (Figure 2). A central I-Beam was secured to the top of the scaffolding and supported a single-line sheave. A manual cable winch was secured to the base with the cable running up to the sheave in a single-line hoisting method for maneuvering the equipment into position. The weather during the examination was cool to moderate so a second temporary structure was erected near the inspection riser. This "tent" was constructed of round tubing and covered with weather resistant material and housed the inspection overview video equipment, deployment tool and video monitor (Figure 2). The tent provided adverse weather protection for the equipment and crew. The control cables leading from the trailer were run along the ground to the equipment located at the riser. The cable was sleeved with plastic to prevent possible contamination

9.0 EXAMINATION RESULTS

The Inspection Data Sheets and an interpretation of the data by a COGEMA Engineering Level III qualified inspector are included in Attachment 2. Tank 241-AY-102 (typical of all double-shell tanks) was fabricated from carbon steel plate. The location of plates as identified in the PNNL report is as follows (See Attachment 1):

Primary knuckle (top) – Connects dome of tank to side-wall.
Primary wall – Consists of (from top to bottom):
- Top Transition Plate – approximately 3 feet, 3 inches tall, 3/8" nominal thickness
- Plate #1 – approximately 9 feet, 10 inches tall, 1/2" nominal thickness
- Plate #2 – approximately 9 feet, 10 inches tall, 1/2" nominal thickness
- Plate #3 – approximately 9 feet tall, 3/4" nominal thickness

Primary knuckle (bottom) – Connects side-wall of tank to primary tank bottom.

All tank welds are in the "as-welded" condition. The primary tanks exterior surface varies from mill scale to a coating of rust caused by the normal weathering of carbon steel. The tank surface also contains chalk marks from hydrostatic test and miscellaneous material identifier markings from construction. In some places, streaks from concrete pouring can be found.

The following pages contain tables that present the data as a percent (%) of nominal wall thickness, which was derived from the "241-AY-102 Double-Shell Tank Ultrasonic Examination Data Reports With Data Sheets" (Attachment 2) and Pacific Northwest National Laboratory report PNNL-12233 (Attachment 1) "Ultrasonic Examination of Double-Shell Tank 241-AY-102".

Table 1 Tank 241-AY-102 Ultrasonic Examination Primary Tank Wall, Scan 1 (Attachment 2)			
Plate	Design Nominal Thickness (inches)	Measured Minimum Thickness (inches)	% Wall Thinning
Plate #1	0.375	0.395	N/A
Plate #2	0.50	0.495	1.0% of nominal thickness
Plate #3	0.50	0.495	1.0% of nominal thickness
Plate #4	0.75	0.735	2.0% of nominal thickness

Table 2 Tank 241-AY-102 Ultrasonic Examination Primary Tank Wall, Scan 2 (Attachment 2)			
Plate	Design Nominal Thickness (inches)	Measured Minimum Thickness (inches)	% Wall Thinning
Plate #1	0.375	0.383	N/A
Plate #2	0.50	0.485	3.0% of nominal thickness
Plate #3	0.50	0.485	3.0% of nominal thickness
Plate #4	0.75	0.734	2.1% of nominal thickness

Table 3 Tank 241-AY-102 Ultrasonic Examination Horizontal and Vertical Primary Tank Weld Scans (Attachment 2)			
Weld	Design Nominal Thickness (inches)	Measured Minimum Thickness (inches)	% Wall Thinning
Vertical Plate #3	0.50	0.465	7% of nominal thickness
Vertical Plate #4	0.750	0.722	3.7% of nominal thickness
Horizontal Between Plate #2and #3	0.50	0.485	3.0% of nominal thickness

Note 1: PNNL evaluated the data and concluded that no wall thinning, pitting, or cracking is present. Refer to PNNL-12233 *Ultrasonic Examination of Double Shell Tank 241-AY-102* (see Attachment 1).

Note 2: Although the data is reported to three decimal places, the accuracy of the data, based on the results of the performance demonstration test is ± 0.020 inch for wall thickness.

10.0 EVALUATION OF EXAMINATION RESULTS

The results of the Tank 241-AY-102 UT examination indicated no reportable wall thinning, pitting, or cracks. Attachment 1 contains the report prepared by PNNL that analyzes the data gathered from Tank 241-AY-102 UT examination. Figure 1 shows the history of waste level matched with the "as-found" measurements of the primary tank wall generated from the inspection data sheets (Attachment 2). Each wall thickness measurement plotted on the figure is the average of all data collected over a 1-foot long by 15-inch wide scan area. No apparent wall thinning, pitting, and cracking.

PNNL UT examination experts independently evaluated (Attachment 1) the hard copy scans and inspection data sheets and concurred with the COGEMA Engineering interpretation (see Attachment 2). The following is a summary of the results associated with the areas examined. The data have been reviewed and approved by W. H. Nelson, COGEMA Engineering Level III qualified inspector (Attachment 2):

Primary Tank Wall Thinning/Pitting/Cracking:

- No reportable thinning, pitting, or cracking was detected.

Primary Tank Horizontal and Vertical Welds:

- No reportable thinning, pitting, or cracking was detected.
- Scans of the heat affected zones (HAZ) between Plate #2 and #3 revealed no pitting, or crack-like indications.
- Welds between Plate #3 and #4 and the lower knuckle weld could not be examined because of surface roughness and contamination (weld and concrete splatter)

11.0 FINDINGS AND CONCLUSIONS

- The absence of cracks in the plate and HAZ indicates that the pre-service material quality control, weld stress relief treatment, and waste chemistry controls have been effective in preventing cracks.
- Since there were no significant changes in the wall thickness and no cracks were detected at any location, corrosion due to suspected mechanisms is probably not occurring to any significant degree. However, uncertainty on conditions that lead to corrosion degradation, particularly stress corrosion cracking, suggest additional data on other tanks are needed to gain confidence that this result can be applied to the general tank population.

12.0 REFERENCES

Hanlon, B.M., 1999, *Waste Tank Summary Report for Month Ending April 30, 1999*, HNF-EP-0182-121, Fluor Daniel Hanford, Inc., Richland, Washington.

Jensen, C. E., 1999, *Final Results of Double-Shell Tank 241-AN-105 Ultrasonic Inspection*, HNF-4816, Rev. 0, Lockheed Martin Hanford Corporation, Richland, Washington

Leshikar, G.A., 1997, *Final Report - Ultrasonic Examination of Tank 241-AW-103 Walls*, HNF-SD-WM-TRP-282, Rev. 1, SGN Eurisys Services Corporation, Richland, Washington.

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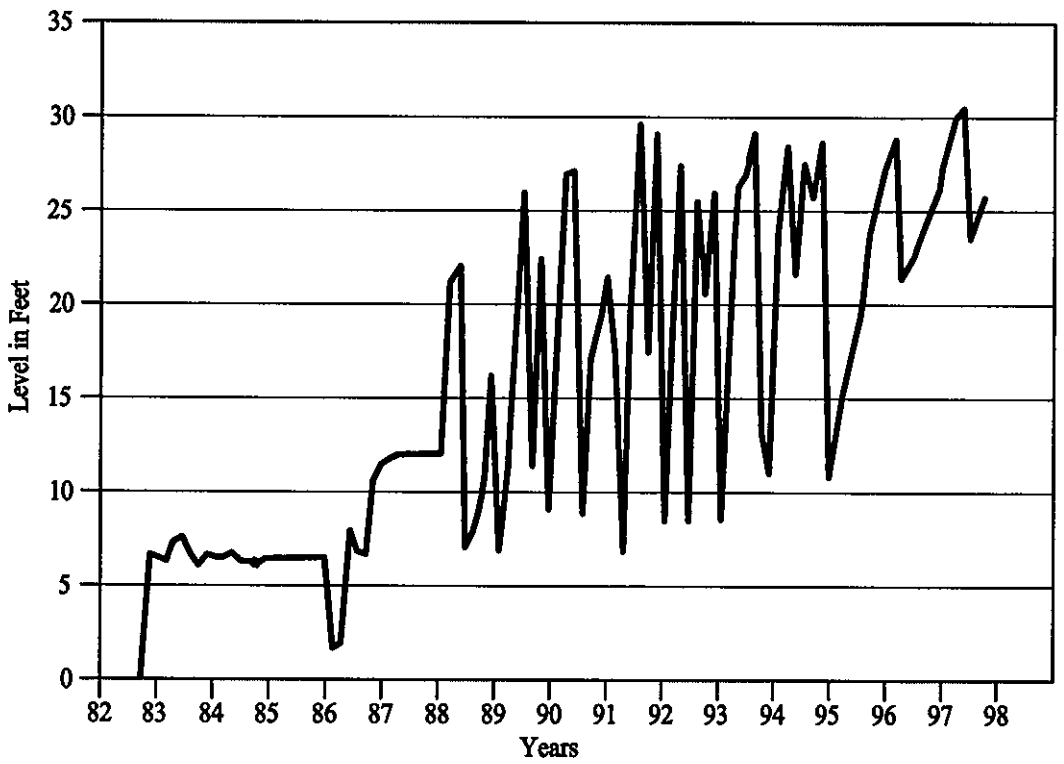
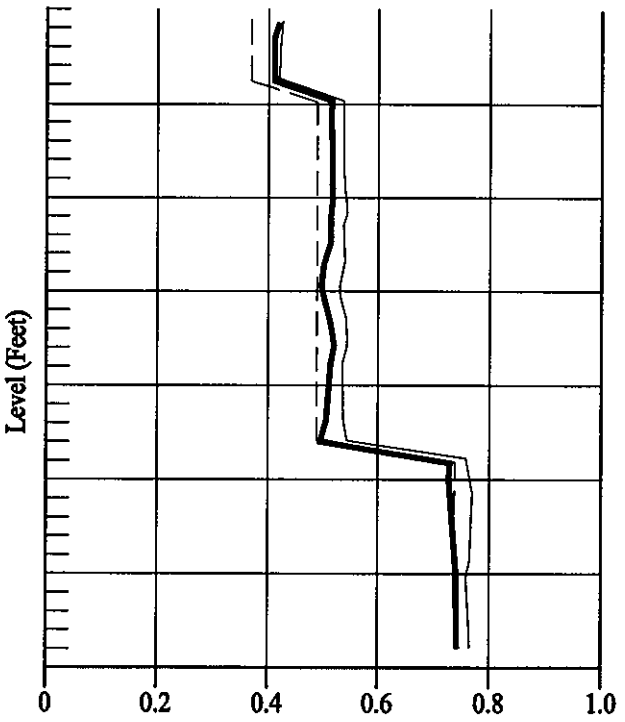
Schwenk, E.B., and Scott, K.V., 1996, *Description of Double-Shell Tank Selection Criteria for Inspection,* WHC-SD-WM-ER-529, Rev. 0, Westinghouse Hanford Company, Richland, Washington.



241-AY-102



Primary Wall Thickness (Inches)

Avg. Thk - Scan #2
Avg. Thk - Scan #1
Nominal Thickness

Figure 1 - Comparison of As-Measured and ASTM-Specified Plate Thickness with Waste Level, DST 241-AY-102

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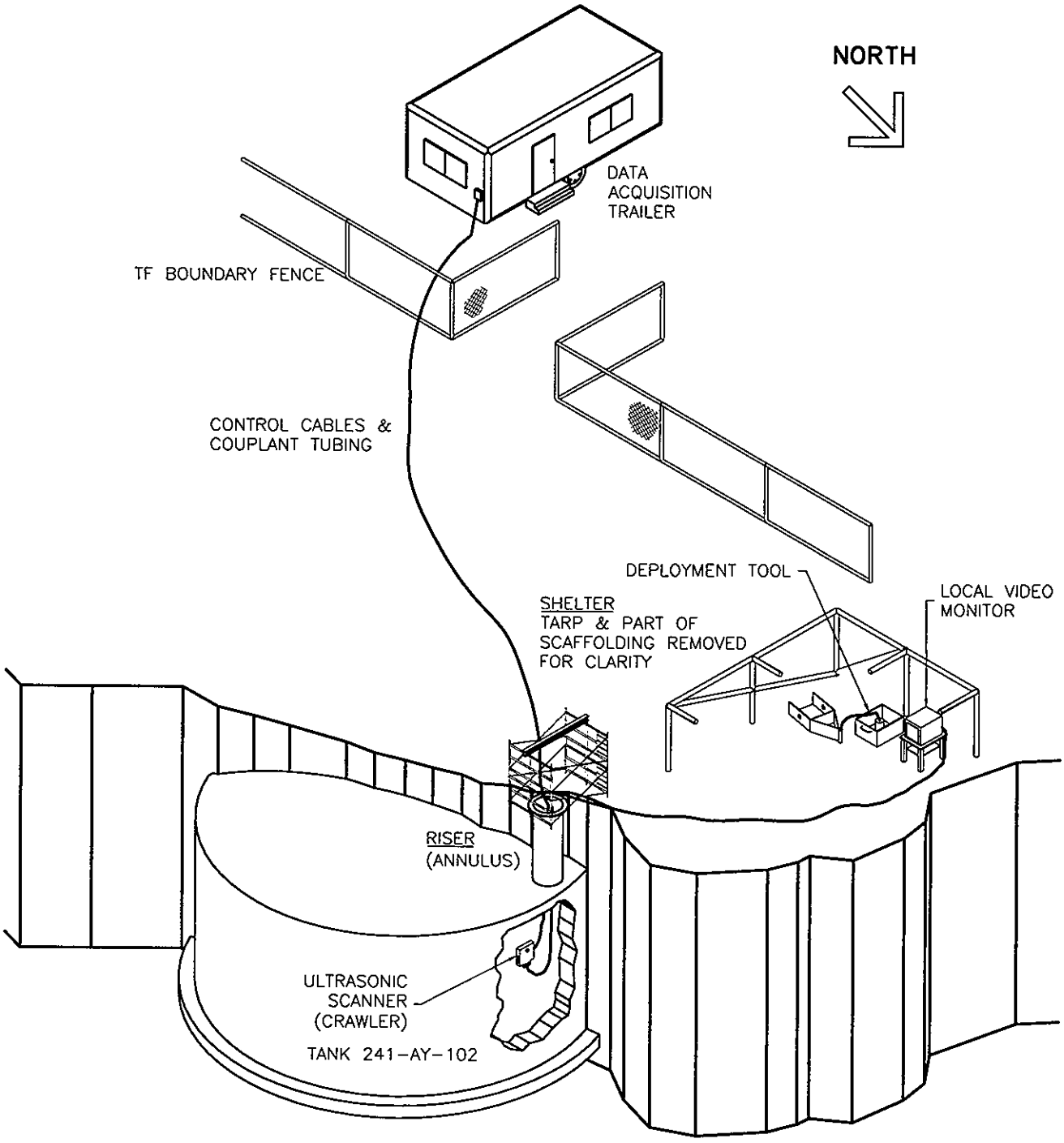

Figure 2 – Schematic of Inspection Set-up 241-AY-102

ATTACHMENT 1

Ultrasonic Examination of Double Shell Tank 241-AY-102

PNNL-12233

Ultrasonic Examination of Double Shell Tank 241-AY-102

G. J. Posakony
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June 1999

Prepared for
Lockheed Martin Hanford Corporation
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Pacific Northwest National Laboratory
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Summary

COGEMA Engineering Corporation (COGEMA), under a contract from Lockheed Martin Hanford Corporation (LMHC), performed an ultrasonic examination of selected portions of Tank 241-AY-102. The purpose of this examination was to provide information that could be used to evaluate the integrity of the wall of the primary tank. To implement the examination, COGEMA contracted with Swain Distribution, Inc. (Swain) of Searcy, Arkansas for the qualified personnel, ultrasonic instrumentation, and remote-controlled mechanical crawler that were to be used in performing this examination. The equipment provided by Swain included the Force Industries, Inc. P-Scan Model PSP-3 ultrasonic flaw detector system and the Force Industries AWS-5D remote, digitally controlled, magnetic-wheel mechanical crawler. The P-Scan Model PSP-3 is the same ultrasonic system used in the inspections of Tanks 241-AW-103, AN-105, and AN-107, but the magnetic wheel crawler was upgraded to Model AWS-5D. The ultrasonic procedure for the examination of the double-shell tanks at Hanford was developed by Swain personnel and approved by Mr. Wesley Nelson. Mr. Nelson is COGEMA's American Society for Nondestructive Testing (ASNT) Certified Level III in ultrasonic testing (UT) and was the UT Level III authority for this project.

Reports PNNL-11971 and PNNL-12198 provide details on the examination requirements, ultrasonic inspection procedure, personnel qualification requirements, and the results from AN-107 and AN-105. For details and information on the performance demonstration test (PDT), please refer to the referenced PNNL reports.

The ultrasonic examination of Tank 241-AY-102 was designed to inspect the wall of the primary tank to detect wall thinning, pit corrosion, and cracks in the tank wall as well as cracks, wall thinning, and other anomalies in the heat-affected zone (HAZ) of vertical, horizontal, and knuckle welds. In Tank 241-AY-102 selected portions of the primary tank wall were examined and these results were used as a representative sampling of conditions in the remainder of the primary tank.

Figure S.1 is a sketch of the portions of Tank 241-AY-102 that were ultrasonically examined. The wall of the primary tank is 32-ft high and is made up of four rings of plates that have been welded together. The ultrasonic examination consisted of inspecting two 15-in.-wide vertical strips the full 32-ft height of the tank to detect wall thinning and any cracking or other anomalies that might be in the wall of the primary tank. In addition, the weld zones of selected vertical and horizontal welds were inspected to detect and characterize any cracks that might lie parallel or perpendicular to the welds. The sketch shows the vertical scan paths for the two ultrasonic plate thickness and plate crack examinations. These scans were separated by approximately 6-in. The sketch also shows the top weld (primary tank to dome weld), vertical and horizontal welds, and knuckle weld. In performing the examinations, the remote-controlled, magnetic wheel crawler was installed in the annulus of the double-shell tank through the 24-in, riser.

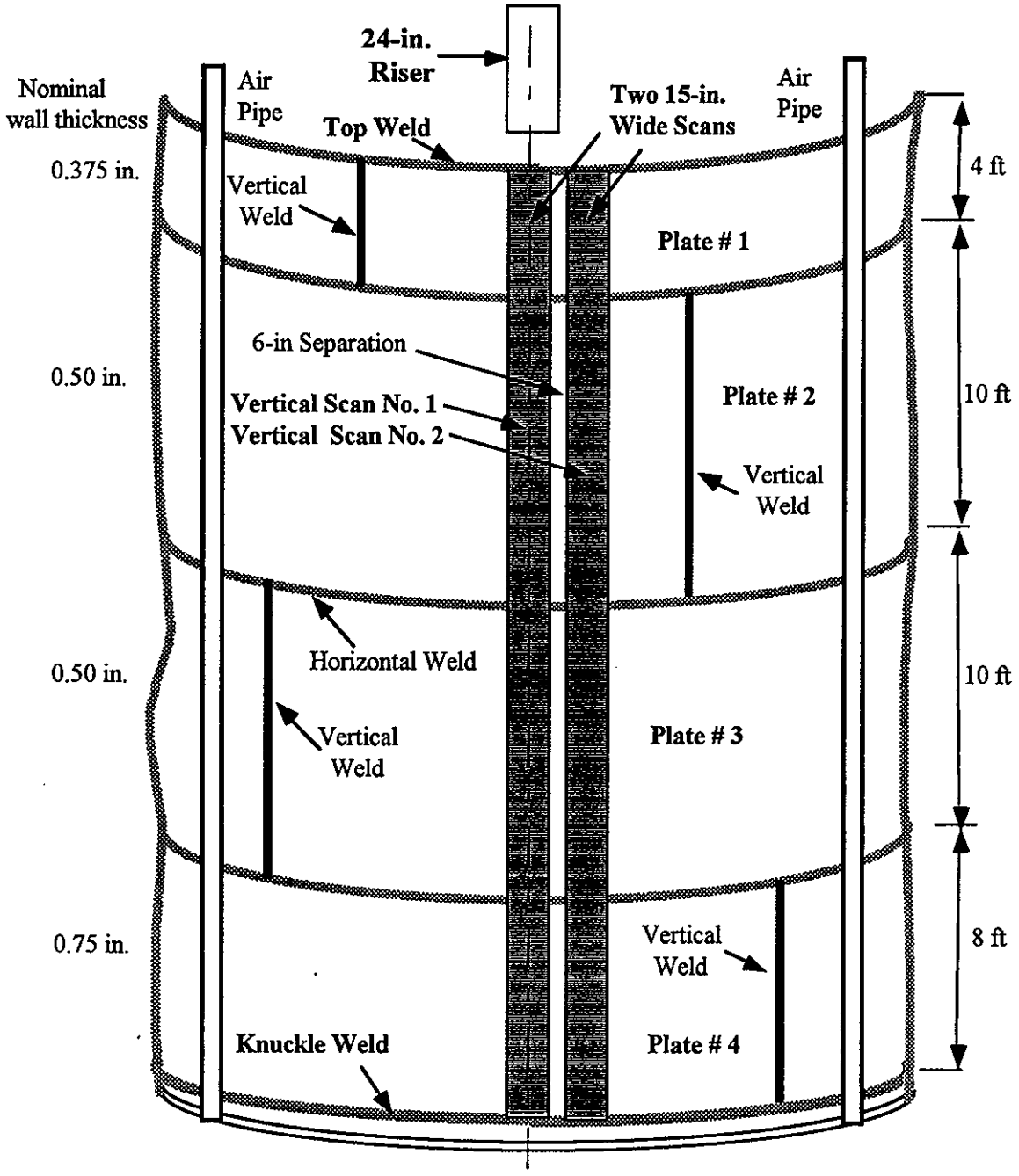

Figure S.1. Sketch of Vertical Scan Paths No. 1 and No. 2 Used for the Ultrasonic Examination of the Primary Tank Wall of 241-AY-102

The shell of Tank 241-AY-102 consists of four cylindrical rings. The top ring (Plate #1) is 4-ft high and has a nominal wall thickness of 0.375 in. The second and third rings (Plate #2 and Plate #3) are 10-ft high and have a nominal wall thickness of 0.500 in. Plate #4 is 8-ft high and has a nominal wall thickness of 0.75 in.[a]

Two separate ultrasonic examinations were made for each of the scan paths of the tank wall shown in Figure S.1. The first examination (0-degree, straight-beam transducer) was designed to detect wall thinning and the presence of cracks. The second examination (±45-degree, angle-beam transducers) was designed to characterize any cracking that might be present in the wall of the primary tank.

A summary of the results is given below. More details are found in the body of the report.

- Plate #1—Scan Paths No. 1 and No. 2—the first examination of this plate recorded wall thickness (nominal 0.375 in.) ranging from a minimum of 0.383 in. to a maximum of 0.405 in. In the second examination, neither scan detected crack-like indications were in the wall of the primary tank.

- Plate #2—Scan Paths No. 1 and No. 2—the first examination of this plate recorded wall thickness (nominal 0.500 in.) ranging from a minimum of 0.485 in. to a maximum of 0.514 in. In the second examination, neither scan detected crack-like indications were in the wall of the primary tank.

- Plate #3—Scan Paths No. 1 and No. 2—the first examination of this plate recorded wall thickness (nominal 0.500 in.) ranging from a minimum of 0.485 in. to a maximum of 0.518 in. In the second examination, neither scan detected crack-like indications were in the wall of the primary tank.

- Plate #4—Scan Paths No. 1 and No. 2—the first examination of this plate recorded wall thickness (nominal 0.75 in.) ranging from a minimum of 0.735 in. to a maximum of 0.748 in. In the second examination, neither scan detected crack-like indications were in the wall of the primary tank.

- Several feet of vertical welds in Plates #3 and #4 were examined with 0-degree, ±45-degree and 60-degree transducers. No crack-like indications, wall thinning or pitting was detected in the HAZ of the welds in these examinations.

- Twenty feet of horizontal weld between Plates #2 and #3 were examined using the same technique used for the vertical welds. No crack-like indications, wall thinning or other indications were found in the HAZ of this weld.

- Welds between Plate #3 and #4 and the lower knuckle weld could not be examined because of surface roughness and contamination (weld and concrete splatter).

(a) Note: All historical dimensioning for the design, development, and construction of this tank are in English units; consequently, English units are the primary units used in this report. For conversion to metric, use 1.0 in. equals 25.4 mm.

Contents

Figures

Tables

1.0 General Information

The requirements for the ultrasonic examination of the wall of Tank 241-AY-102 were to detect, characterize (identify, size, and locate) and record measurements made of wall thickness, pitting or cracking in the wall or in the heat-affected zone (HAZ) of the welds in the primary tank. Any conditions that exceeded the requirements set forth below were to be reported for further examination.

1.1 Specific Requirements

Measurements that are to be specifically recorded include the following:

- Wall thinning that exceeds 10% of the nominal thickness of the plate
- Pits with depths that exceed 25% of the plate thickness
- Stress-corrosion cracks located on the inner wall of the primary tank or in the HAZ of welds that exceed a depth of 0.18 in.

The accuracy requirements for depth measurements for the different types of defects includes:

- Wall thinning—measure thickness within ±0.02 in.
- Pits—size depths within ±0.05 in.
- Cracks—size the depth of cracks on the inner wall surfaces within ±0.100 in.
- Location—locate all reportable indications within ±1.0 in.

Data to be recorded on disk and hard copies of all measurements are to be provided to PNNL and LMHC.

2.0 Results of the Examinations of the Vertical Wall of the Primary Tank 241-AY-102

Figure S.1 shows the two vertical scan paths taken on the full height of the tank. Each of the paths was 15-in. wide, providing a total of 30-in. coverage of the cylindrical section of the tank for the full height (32-ft) from the top weld to the knuckle weld. Two separate 15-in. wide scans (traverse direction on the scanning bridge of the mechanical crawler) were made. The first examination provided a measurement of wall thinning and/or pit corrosion using a straight beam (0-degree) transducer. The

second examination used two 45-degree opposing transducers and provided information on any cracks in the plates of the wall of the primary tank. Tables 1 through 4 describe the results of the two vertical examinations of the primary tank wall.

To initiate the examination, the remote mechanical crawler was inserted through the 24-in. riser and lowered until the magnetic wheels attached to the wall of the primary tank. The examination was then initiated by maneuvering the remote crawler until the transducer(s) were positioned at the top weld between the tank shell and the dome. The mechanical scanner was programmed to traverse a 15-in. scan, index down the tank wall and repeat the sequence until the entire height of the tank was examined. Pressurized water was used as a couplant between the transducer and the tank wall. The scan index (down the vertical wall) was 0.10 in. There were 120 traverse scans were taken for every foot of the height of the tank. The encoder on the scanner divided the 15-in. length of the traverse scan into pixels estimated to be 0.125-in. wide or 120 pixels. The ultrasonic data acquisition system recorded 14400 pixels for every foot of vertical scan path. Hard copy information was provided on an ultrasonic C-scan plot for each 12 by 15-in. area scanned. The analyst used this information in conjunction with the software program to determine and record the minimum value in each 12 by 15-in. area. The values in Tables 1 through 4 are the minimum values recorded in each area for the two scan paths. These values are part of the data recorded by the analyst on the "Automated Thickness Data Report." While only the minimum thickness is recorded on these reports, data are available to measure any individual pixel or point in the area scanned. In addition to the minimum thickness value reported, the tables also provide information regarding the results of the angle-beam examination that was designed to detect any cracking that might have been present in the tank wall. In the angle beam examination, two 45-degree angle-beam transducers were used. These angle-beam transducers were separated by approximately 5 in. and their beams were directed toward one another to obtain a volumetric inspection of the tank wall.

The tables provide information on the distance down from the top weld and the results obtained from the ultrasonic examination at each level. Interpreting the data in Table 1 from Plate #1, in the 1-ft section below the top weld (between the shell and the dome) the minimum thickness recorded was 0.398 in. in Scan Path No. 1 and 0.405 in Scan Path No. 2. The minimum wall thickness recorded in this 4-ft transition plate in Scan Path No. 2 between 2 and 3 ft. from the top weld where a value of 0.383 was measured. The nominal wall thickness was reported to be 0.375 in. and all thicknesses measured were above this value. The results of the 45-degree angle-beam examination recorded in the table showed no crack-like indications in either scan. Similar data interpretation can be made in the Tables 2, 3, and 4.

A review of the information in the tables shows that no anomalous conditions were detected by the ultrasonic examination. It is believed that these results are a representative sampling of the condition in the wall of the primary tank. No examination was performed on other portions of the primary or secondary tanks.

Table 1. Data from the Vertical UT Scan Paths on the Primary Tank Wall, Plate #1

Distance from the Top Weld (ft)	Results from the Ultrasonic Examination of Plate #1. Vertical Scan Path No. 1		Results from the Ultrasonic Examination of Plate #1. Vertical Scan Path No. 2	
	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination
0 to 1	0.398	No crack-like indications were detected in this plate	0.405	No crack-like indications were detected in this plate
1 to 2	0.398		0.395	
2 to 3	0.395		0.383	
3 to 4	0.398		0.390	

Table 2. Data from the Vertical UT Scan Paths on the Primary Tank Wall, Plate #2

Distance from the Top Weld (ft)	Results from the Ultrasonic Examination of Plate #2. Vertical Scan Path No. 1		Results from the Ultrasonic Examination of Plate #2. Vertical Scan Path No. 2	
	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination
4 to 5	0.495	No crack-like indications were detected during the examination of this plate	0.493	No crack-like indications were detected during the examination of this plate
5 to 6	0.500		0.493	
6 to 7	0.510		0.495	
7 to 8	0.510		0.498	
8 to 9	0.503		0.498	
9 to 10	0.503		0.498	
10 to 11	0.508		0.493	
11 to 12	0.518		0.490	
12 to 13	0.514		0.485	
13 to 14	0.514		0.493	

Table 3. Data from the Vertical UT Scan Paths on the Primary Tank Wall, Plate #3

Distance from the Top Weld (ft)	Results from the Ultrasonic Examination of Plate #3. Vertical Scan Path No. 1		Results from the Ultrasonic Examination of Plate #3. Vertical Scan Path No. 2	
	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination
14 to 15	0.500	No crack-like indications were detected during the examination of this plate	0.490	No crack-like indications were detected during the examination of this plate
15 to 16	0.518		0.485	
16 to 17	0.510		0.490	
17 to 18	0.508		0.488	
18 to 19	0.508		0.490	
19 to 20	0.508		0.490	
20 to 21	0.503		0.490	
21 to 22	0.498		0.490	
22 to 23	0.495		0.493	
23 to 24	0.510		0.498	

Table 4. Data from the Vertical UT Scan Paths on the Primary Tank Wall, Plate #4

Distance from the Top Weld (ft)	Results from the Ultrasonic Examination of Plate #4. Vertical Scan Path No. 1		Results from the Ultrasonic Examination of Plate #4. Vertical Scan Path No. 2	
	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination	Minimum Thickness Recorded in Area Scanned (in.)	45-Degree Angle Beam Examination
24 to 25	0.735	No crack-like indications were detected during the examination of this plate	0.739	No crack-like indications were detected during the examination of this plate
25 to 26	0.748		0.739	
26 to 27	0.757		0.743	
27 to 28	0.739		0.743	
28 to 29	0.744		0.743	
29 to 30	0.748		0.734	
30 to 31	0.744		0.739	
31 to 32	0.739		0.743	

3.0 Results Recorded in the Examination of Selected Vertical and Horizontal Welds

An ultrasonic examination was performed to detect stress corrosion cracks, wall thinning and pitting in the HAZ of a selected number of welds. Since stress corrosion cracks could lie perpendicular or parallel to the weld line, two separate examinations were performed. The first examination used a pair of 45-degree opposing transducers to detect and characterize cracks that might lie perpendicular to the weld line. In the second examination a straight beam (0-degree) transducer was used to detect wall thinning and corrosion, and a 60-degree transducer was used to detect and characterize cracks that might lie parallel to the weld line. The HAZ was defined as that area that lies on the inner 3/4 T (thickness) of the plate and extending 1.0 in. from the edge of the weld bead. The following lists the welds that were examined. Because of interference between the transducer housing and the weld bead, a blind zone existed from the edge of the weld bead to 1/2 in. into the base metal.

- Vertical weld in Plate #3—10 ft of the HAZ of this plate was examined with the 0-degree, 45-degree and 60-degree transducers. No crack-like indications, wall thinning or pitting was detected in any of the examinations.

- Vertical weld in Plate #4—9 ft of the HAZ of this plate was examined with the 0-degree, 45-degree and 60-degree transducers. No crack-like indications, wall thinning or pitting was detected in any of the examinations.

- Horizontal weld between Plates #2 and #3—24 ft of the horizontal weld between Plates #2 and #3 were examined with the 0-degree, 45-degree and 60-degree transducers. No crack-like indications, wall thinning or pitting was detected in any of these examinations.

  Comment #1: The horizontal weld between Plates #3 and #4 could not be examined ultrasonically because of surface roughness, weld spatter, and other conditions on the surface of the plate in the HAZ that prevented the transducers from maintaining ultrasonic contact with the plate.

  Comment #2: The knuckle weld could not be examined ultrasonically because of the concrete spatter on the surface of the tank in the weld area that caused the transducer to lift off the surface and prevented consistent ultrasonic coupling of the acoustic energy.

4.0 Concluding Comments

The two 15-in. wide ultrasonic examinations were made on the full height of the primary tank wall of Tank 241-AY-102 to detect wall thinning, pitting and cracks. These examinations in the vertical tank wall were intended to sample the condition of the tank and to provide information that could be used to

establish the tank's integrity. The results of the examinations in the selected areas showed very little or no corrosion in the four plates that go to make up the shell of the primary tank. Further, no crack-like indications were detected in the wall of the primary tank.

The HAZ of the vertical welds in Plates #3 and #4 and the horizontal weld between Plates #2 and #3 were examined to detect stress-corrosion cracks, pitting, and wall thinning. The ultrasonic examination did not detect wall thinning in excess of 4% of the nominal wall thickness in the HAZ and found no crack-like indications from cracks that might lie in either parallel or perpendicular to the weld line. No abnormal indications were found in the heat-affected zone of the welds examined.

Based on the results of the ultrasonic examinations in the areas examined, Tank 241-AY-102 has no apparent wall thinning greater than the nominal wall thickness that might be expected from manufacturing variations and has no detectable cracks in the wall of the primary tank.

ATTACHMENT 2

241-AY-102 Double-Shell Tank Ultrasonic Examination Data Reports With Data Sheets

COGEMA-99-1017

COGEMA
ENGINEERING CORP.

June 30, 1999 COGEMA-99-1017

Mr. Chris E. Jensen
Lockheed Martin Hanford Corporation
Post Office Box 1500, MSIN R1-56
Richland, Washington 99352-1505

Dear Mr. Jensen:

AY-102 DOUBLE SHELL TANK ULTRASONIC EXAMINATION DATA REPORTS

Ultrasonic examination of double shell tank (DST) AY-102 was completed on June 4,1999. The primary tank data showed no reportable indications. Primary tank wall areas ultrasonically inspected were two vertical wall scans approximately 15 inches wide by 30 feet long, and 19 feet of the vertical weld and 25 feet of horizontal welds.

The project specification required an ultrasonic inspection of the horizontal weld between the bottom transition plate and the knuckle. However due to concrete material adhered to the inspection surface examination of the weld was not possible. With LMHC concurrence the horizontal weld between plates 1 and 2 was substituted for the weld between the bottom transition plate and the knuckle.

COGEMA Engineering is pleased to provide the enclosed AY-102 DST Ultrasonic Examination Calibration Sheets and Ultrasonic Data Reports. This completes our nondestructive examination of DST AY-102. The original ultrasonic report was transferred to Mr. Jerry Posakony at PNNL for final evaluation.

If you have any questions, please feel free to contact me at (509) 376-5403.

Sincerely,

W. H. Nelson
COGEMA NDE Ultrasonic Level III

cjl

Enclosure

P.O. Box 840
Richland, Washington 99352-0840
Phone (509) 372-3572 • Fax (509) 372-3169

2/99

AUTOMATED ULTRASONIC THICKNESS CALIBRATION SHEET

CALIBRATION REPORT# N/A

LOCATION: HANFORD	SYSTEM: DST TANK AY102	CALIBRATION BLOCK: SDI PT-1 / STEP BLK.	
PROCEDURE: SDI 2.1 Rev. 3		THICKNESS: 0.75"/0.1-1.00	MATERIAL: CS/CS
UT SYSTEM: PSP-3	SERIAL #: 305	REFERENCE BLOCK: IIW	
SOFTWARE VERSION: P-Scan / T-Scan	REV.: 6.05	THICKNESS: 4" SP / 1" T	MATERIAL: CS
LINEARITY DUE DATE: 6/15/99		REFERENCE BLOCK TEMP: AMBIENT °F	PYRO SN.: N/A
SCANNER TYPE: AWS-5D	SERIAL #: 105	COUPLANT: WATER	BATCH #: N/A
SCANNER CABLE: AWS-5D		CABLE LENGTH: 400'	CABLE #: N/A
SIGNAL CABLE: RG 59		CABLE LENGTH: 400'	CABLE #: N/A

CHANNEL	TRANSDUCER MAKE	MODEL	FREQ.	SIZE	SERIAL #	GATE EVAL METHOD	ANGLE	WEDGE TYPE	IMAGE
1	KrautKramer	MSEB 5E	5	2(8x2mm)	1642	EDGE CONT	0°	STND	1
2	KrautKramer	MSEB 5E	5	2(8x2mm)	1642	PKE CONT	0°	STND	2
3	KrautKramer	MSEB 5E	5	2(8x2mm)	1637	EDGE CONT	0°	STND	3
4	KrautKramer	MSEB 5E	5	2(8x2mm)	1637	PKE CONT	0°	STND	4

	INITIAL CALIBRATION			CALIBRATION CHECKS				
DATE		5/7/99	5/11/99	5/11/99				
TIME		1430	0959	2055				
REFLECTOR		BACKWALL	BACKWALL	BACKWALL				
CH. 1	THK.1 0.30	0.301	0.305	0.305				
	THK. 2 1.00	1.000	1.000	1.000				
CH. 2	THK.1 0.3/.5	0.301	0.502	0.502				
	THK. 2 1.00	1.001	1.000	1.000				
CH. 3	THK.1 0.3	0.301	0.296	0.280				
	THK. 2 1.00	1.000	0.995	0.987				
CH. 4	THK.1 0.3/0.5	0.296	0.493	0.480				
	THK. 2 1.00	0.996	0.991	0.982				
FILE #		AY2CL201	AY2CL202	AY2CL203				
DISK #		AY2FW14	AY2FW14	AY2FW18				
EXAMINER		[illegible]	[illegible]	[illegible]				

REMARKS

Examiner: James B. Fiddler
Level III Date 5/11/99

Examiner: N/A
Level ___ Date ___

Reviewer: [illegible]
Level III Date 6-4-99
COGEMA

2/99

AUTOMATED ULTRASONIC THICKNESS CALIBRATION SHEET

CALIBRATION REPORT# N/A

LOCATION HANFORD	SYSTEM DST TANK A4102	CALIBRATION BLOCK STEP BLK.	
PROCEDURE SDI 2.1 Rev. 3		THICKNESS 0.1 - 1.00	MATERIAL CS
UT SYSTEM PSQ-3	SERIAL # 305	REFERENCE BLOCK IIW	
SOFTWARE VERSION D-Scan / T-Scan	REV. 6.05	THICKNESS 1"	MATERIAL CS
LINEARITY DUE DATE 6/15/99		REFERENCE BLOCK TEMP AMBIENT °F	PYRO SN. N/A
SCANNER TYPE AWS-5D	SERIAL # 105	COUPLANT WATER	BATCH # N/A
SCANNER CABLE AWS-5D		CABLE LENGTH 400'	CABLE # N/A
SIGNAL CABLE RG 59		CABLE LENGTH 400'	CABLE # N/A

CHANNEL	TRANSDUCER MAKE	MODEL	FREQ.	SIZE	SERIAL #	GATE EVAL METHOD	ANGLE	WEDGE TYPE	IMAGE
1	KrautKramer	MSEB 5E	5	2(8X2mm)	1642	EDGE LONT	0°	STND	1
2	KrautKramer	MSEB 5E	5	2(8X2mm)	1642	PK-E LONT	0°	STND	2
3			N						
4				A					

INITIAL CALIBRATION / CALIBRATION CHECKS									
DATE		5/2/99	5/3/99	5/3/99	5/4/99	5/4/99			
TIME		1612	1010	2130	0914	2151 *			
REFLECTOR		STEP BLK	STEP BLK	STEP BLK	STEP BLK	STEP BLK			
CH. 1	THK.1 0.3	0.305	0.305	0.301	0.305	0.289			
	THK. 2 1.0	1.004	1.009	1.009	1.004	0.991			
CH. 2	THK.1 0.3	0.305	0.305	0.301	0.305	0.287		N/A	
	THK. 2 1.0	1.004	0.995	0.995	1.009	0.991			
CH. 3	THK.1	N/A	N/A	N/A	N/A	N/A			
	THK. 2								
CH. 4	THK.1								
	THK. 2								
FILE #		A42-CL01	A42CL02	A42CL03	A42CL04	A42 CL05			
DISK #		A42 PW1	A42 PW1	A42 PW3	A42 PW4	A42 PW6			
EXAMINER		JBB	JBB	JBB	JBB	JBB			

REMARKS

* Unable to meet 12hr. due to radiological issues. Cal. OK. JBB

Examiner	Examiner	Reviewer	Page
James B. Ellen	N/A	W. H. Nelson	2 of 30
Level III Date 5/4/99	Level ___ Date ___	Level III Date 6.4.99 COGEMA	

AUTOMATED ULTRASONIC P-SCAN CALIBRATION SHEET

CALIBRATION REPORT# N/A

LOCATION: Hanford	SYSTEM: DST Tank A402	CALIBRATION BLOCK: SDI PT-1	
PROCEDURE: SDI 2.1 Rev. 3		THICKNESS: 0.75	MATERIAL: CS
UT SYSTEM: PSP-3	SERIAL #: 305	REFERENCE BLOCK: IIW 4"	
SOFTWARE VERSION: P-Scan / T-scan	REV.: 6.05	THICKNESS: 4" SP	MATERIAL: CS
LINEARITY DUE DATE: 6/15/99		REFERENCE BLOCK TEMP: AMBIENT °F	PYRO SN.: N/A
SCANNER TYPE: AWS-5D	SERIAL #: 105	COUPLANT: WATER	BATCH #: N/A
SCANNER CABLE: AWS-D		CABLE LENGTH: 400'	CABLE #: N/A
SIGNAL CABLE: RG 59		CABLE LENGTH: 400'	CABLE #: N/A

CHANNEL	TRANSDUCER MAKE	MODEL	FREQ.	SIZE	SERIAL #	GATE EVAL METHOD	ANGLE NOM./ACT.	WEDGE TYPE	IMAGE
1	KrautKramer	MWB 45 4E	4	8x9mm	2423	ICODE 20	45/44	STND	1&2
2	KrautKramer	MWB45 4E	4	8x9mm	2412	ICODE 20	45/44	STND	3&4
3		N							
4					A				

	INITIAL CALIBRATION	CALIBRATION CHECKS						
DATE	5/5/99	5/5/99	5/6/99	5/6/99				
TIME	1236	2241	1007	2045				
REFLECTOR / ORRIENTATION	0.05" ID NOTCH	0.05" ID NOTCH	0.05" ID NOTCH	0.05" ID NOTCH				
CH. 1 AMPLITUDE	75dB (+1dB)	+0dB	75 +0dB	+1dB		N		
CH. 1 LOCATION	ID	ID	ID	ID				
CH. 2 AMPLITUDE	72dB (+1dB)	+2dB	74 +0dB	+1dB				
CH. 2 LOCATION	ID	ID	ID	ID				
CH. 3 AMPLITUDE								
CH. 3 LOCATION	N	N	N	N				
CH. 4 AMPLITUDE	A	A	A	A			A	
CH. 4 LOCATION								
FILE #	AY2CL4A1	AY2CL4A2	AY2CL4A3	AY2CL4A4				
DISK #	AY2 PW7	AY2 PW10	AY2 PW11	AY2 PW13				
EXAMINER	[illegible]	[illegible]	[illegible]	[illegible]				

REMARKS: N/A

Examiner	Examiner	Reviewer	Page
Level III Date 5/6/99	N/A Level ___ Date ___	Level III Date 6-4-99 COG: MA	3 of 30

AUTOMATED ULTRASONIC P-SCAN CALIBRATION SHEET

CALIBRATION REPORT# N/A

LOCATION: HANFORD	SYSTEM: DST	CALIBRATION BLOCK: SDI PT-1	
PROCEDURE: SDI 2.1 REV. 3		THICKNESS: 0.75"	MATERIAL: CS
UT SYSTEM: PSP-3	SERIAL #: 305	REFERENCE BLOCK: IIW	
SOFTWARE VERSION: P-SCAN/T-SCAN	REV.: 6.05	THICKNESS: 1", 4" SP	MATERIAL: CS
LINEARITY DUE DATE: 6-15-99		REFERENCE BLOCK TEMP: AMBIENT °F	PYRO SN.: N/A
SCANNER TYPE: AWS-5D	SERIAL #: 105	COUPLANT: WATER	BATCH #: N/A
SCANNER CABLE: AWS-5D		CABLE LENGTH: 400'	CABLE #: N/A
SIGNAL CABLE: RG-59		CABLE LENGTH: 400'	CABLE #: N/A

CHANNEL	TRANSDUCER MAKE	MODEL	FREQ.	SIZE	SERIAL #	GATE EVAL METHOD	ANGLE NOM./ACT.	WEDGE TYPE	IMAGE
1	KBA	MWB45-04	4 Mhz	8 x 9 mm	30042		45°/44°	INT.	1
2	KBA	MWB45-04	4 Mhz	8 x 9 mm	2415	N/A	45°/46°	INT.	2
3	KBA	MWB45-04	4 Mhz	8 x 9 mm	2423		45°/44°	INT.	3
4	KBA	MWB45-04	4 Mhz	8 x 9 mm	2412		45°/46°	INT.	4

		INITIAL CALIBRATION	CALIBRATION CHECKS					
DATE		5-15-99	5-15-99					
TIME		09:53	14:13					
REFLECTOR / ORRIENTATION		.050" ID NOTCH	.050" ID NOTCH					
CH. 1	AMPLITUDE	81 dB	81 dB					
	LOCATION	ID	ID					
CH. 2	AMPLITUDE PS: 80 76 dB		79 dB			N/A		
	LOCATION	ID	ID					
CH. 3	AMPLITUDE	78 dB	80					
	LOCATION	ID	ID					
CH. 4	AMPLITUDE	81 dB	80 dB					
	LOCATION	ID	ID					
FILE #		AY2CL4C1	AY2CL4C2					
DISK #		P45C-1	P45C-4					
EXAMINER		R. SWAIN	R. SWAIN					

REMARKS

N/A

Examiner	Examiner	Reviewer	Page
Ronald V. Swain	N/A	W. D. Meeker	4 of 30
Level II Date 5-15-99	Level ___ Date ___	Level III Date 6.4.99 COGEMA	

2/99

AUTOMATED ULTRASONIC P-SCAN CALIBRATION SHEET

CALIBRATION REPORT# N/A

LOCATION: HANFORD	SYSTEM: DST	CALIBRATION BLOCK: SDI PT-1	
PROCEDURE: SDI 2.1 REV. 3		THICKNESS: 0.75"	MATERIAL: CS
UT SYSTEM: PSP-3	SERIAL #: 305	REFERENCE BLOCK: ITW	
SOFTWARE VERSION: P-SCAN / T-SCAN	REV.: 6.05	THICKNESS: 1", 4" S.P.	MATERIAL: CS
LINEARITY DUE DATE: 6-15-99		REFERENCE BLOCK TEMP: AMBIENT °F	PYRO SN: N/A
SCANNER TYPE: AWS-5D	SERIAL #: 105	COUPLANT: WATER	BATCH #: N/A
SCANNER CABLE: AWS-5D		CABLE LENGTH: 400'	CABLE #: N/A
SIGNAL CABLE: RG-59		CABLE LENGTH: 400'	CABLE #: N/A

CHANNEL	TRANSDUCER MAKE	MODEL	FREQ.	SIZE	SERIAL #	GATE EVAL METHOD	ANGLE NOM./ACT.	WEDGE TYPE	IMAGE
1	KBA	MWB60-4E	4 Mhz	8X9mm	1855	N	60°/59°	INT.	1 & 2
2	KBA	MWB60-4E	4 Mhz	8X9mm	1854	A	60°/59°	INT.	3 & 4
3				N					
4				A					

		INITIAL CALIBRATION	CALIBRATION CHECKS						
DATE		5-14-99	5-14-99						
TIME		0930	17:16						
REFLECTOR / ORRIENTATION		0.050" ID NOTCH	0.050" ID NOTCH						
CH. 1	AMPLITUDE	64 dB	64 dB						
	LOCATION	ID	ID			N			
CH. 2	AMPLITUDE	66 dB	66 dB			A			
	LOCATION	ID	ID						
CH. 3	AMPLITUDE								
	LOCATION	N							
CH. 4	AMPLITUDE		A						
	LOCATION								
FILE #		AY2CL6A1	AY2CL6A2			N			
DISK #		P60A-1	P60A-5						
EXAMINER		R. SWAIN	R SWAIN			A			

REMARKS

N/A

Examiner	Examiner	Reviewer	Page
Ronald V. Swain	N	W D Nelson	5 of 30
Level II Date 5-14-99	Level ___ Date ___	Level III Date 6-4-99	
	A	COGEMA	

2/99

AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION: HANFORD	SYSTEM: DST TANK AY102	EXAM START: 1045	EXAM END: 1130	JOB #: N/A
COMPONENT ID: PRIMARY WALL TOP TRANSITION PLATE 0°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.375"
CONFIGURATION: TOP TRANSITION PLATE SCAN 1.0°	TO	CALIBRATED RANGE: 0.3-1.0		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 36.6"	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER ____		CONDITION: Fair
FILE NAME/ITEM#: AY2PWT10	DATA DISK#	TRANSDUCER: ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE ____		
X_o REF. POINT (Lo): 1" below Haunch Weld toe	Y_o REF. POINT (Wo): ~ ℄ of 24" Riser	SCAN WIDTH: 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.418	.398	NO	
2					.416	.398	NO	
3					.412	.395	NO	
4					.413	.398	NO	
SUMMARY MERGED RESULTS								

REMARKS

Examiner: James B. Elder — Level III — Date 5/11/99

Analyst: James B. Elder — Level III — Date 5/13/99

Reviewer: W.D. Nelson — Level III — Date 6-4-99 — COGEMA

2/99

AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION: HANFORD	SYSTEM: DST AY102	EXAM START: 1150	EXAM END: 1411	JOB #: N/A
COMPONENT ID: AY102 PRIMARY WALL PLATE 1 SCAN 1 0°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 1/2"
CONFIGURATION: TOP TRANS. PLATE	TO: PLATE 1	CALIBRATED RANGE: 0.3 - 1.0 "		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 114 1/2"	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): +2.03 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER ____		CONDITION: fair
FILE NAME/ITEM#: AY2R0110	DATA DISK#	TRANSDUCER: ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE ____		
Xo REF. POINT (Lo): -1" from toe of weld	Yo REF. POINT (Wo): -7" cw of Riser & (24")	SCAN WIDTH: 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.535	.495	NO	
2					.533	.500	NO	
3					.531	.510	NO	
4					.533	.510	NO	
5					.538	.503	NO	
6					.538	.503	NO	
7					.536	.508	NO	
8					.537	.518	NO	
9					.535	.514	NO	
10					.532	.514	NO	
SUMMARY MERGED RESULTS								

REMARKS

N/A

Examiner James B Ellen Level III Date 5/3/99

Analyst James B Ellen Level III Date 5/12/99

Reviewer W H Nelson Level III Date 6-4-99 COGEMA

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION Hanford	SYSTEM DST TANK AY102	EXAM START 1445	EXAM END 1700	JOB # N/A
COMPONENT ID PRIMARY WALL, PLATE 2, SCAN 1 0°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 1/2"
CONFIGURATION	TO PLATE 2	CALIBRATED RANGE 0.3-1.0		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 115"	SCAN LENGTH/PART 12	REF. LEVEL CORRECTION (TRANS. CORR) 20 3 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION fair
FILE NAME/ITEM# A42PW210	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
X_o REF. POINT (L_o) 1" from toe of weld	Y_o REF. POINT (W_o) -7" cw from 24" riser ℄	SCAN WIDTH 15		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.535	.500	NO	
2					.526	.518	NO	
3					.535	.510	NO	
4					.537	.508	NO	
5					.537	.508	NO	
6					.534	.508	NO	
7					.533	.503	NO	
8					.534	.498	NO	
9					.536	.495	NO	
10					.540	.510	NO	
SUMMARY MERGED RESULTS								

REMARKS

N/A

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION HANFORD	SYSTEM DST TANK AY102	EXAM START 1850	EXAM END 2050	JOB # N/A
COMPONENT ID PRIMARY WALL PLATE 3, SCAN 1, 0°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.75"
CONFIGURATION	TO PLATE 3	CALIBRATED RANGE 0.3" - 1.0"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 93"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 3 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# A/2PW310	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
X_o REF. POINT (Lo) ~1" below weld toe	Y_o REF. POINT (Wo) -7" cw of 24" riser &	SCAN WIDTH 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.774	.735	NO	
2					.779	.748	NO	
3					.779	.757	NO	
4					.773	.739	NO	
5					.778	.744	NO	
6					.783	.748	NO	
7					.773	.744	NO	
8					773	.739	NO	
SUMMARY MERGED RESULTS								

REMARKS

N/A - Laminations detected throughout plate.

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION HANFORD	SYSTEM DST TANK AY102	EXAM START 1200	EXAM END 1251	JOB # N/A
COMPONENT ID PRIMARY WALL TOP TRANSITION PLATE SCAN 2, 0°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.375"
CONFIGURATION TOP TRANSITION PLATE, SCAN 2, 0° TO		CALIBRATED RANGE 0.3-1.0"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 36.2"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION fair
FILE NAME/ITEM# AY2PWT20	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
X_o REF. POINT (L_o) 1" BELOW HAUNCH WELD	Y_o REF. POINT (W_o) 19" CW from PLATE 1 WELD.	SCAN WIDTH 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					0.413	0.405	NO	
2		N/A			0.408	0.395	NO	N/A
3			N/A		0.404	0.383	NO	
4					0.405	0.398	NO	
				N/A				
						N/A		
SUMMARY MERGED RESULTS								

REMARKS

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION Hanford	SYSTEM DST TANK AY102	EXAM START 1210	EXAM END 1510	JOB # N/A
COMPONENT ID Primary Wall Plate 1, Scan 2		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 1/2"
CONFIGURATION	TO Plate 1 0°	CALIBRATED RANGE 0.3 – 1.0"		TEMP Ambient °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 113.8"	SCAN LENGTH/PART 12	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# AY2PW120	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
X_o REF. POINT (L_o) 14 below Weld	Y_o REF. POINT (W_o) ~12" ccw from 24" riser &	SCAN WIDTH 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.509	.493	NO	
2					.501	.493	NO	
3					.508	.485	NO	
4					.509	.498	NO	
5					.511	.498	NO	
6					.512	.498	NO	
7					.513	.493	NO	
8					.509	.490	NO	
9					.507	.485	NO	
10					.510	.493	NO	
SUMMARY MERGED RESULTS								

REMARKS

Examiner James B. Eller Level III Date 5/4/99
Analyst James B. Eller Level III Date 5/12/99
Reviewer W. H. Nelson Level III Date 6.4.99 COGEMA
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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION: HANFORD 200E	SYSTEM: DST TANK AY102	EXAM START: 1600	EXAM END: 1729	JOB #: N/A
COMPONENT ID: AY102 PRIMARY WALL PLATE 2 SCAN 2 0°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.5"
CONFIGURATION	TO: PLATE 2	CALIBRATED RANGE: 0.3" - 1.00"		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 115	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER ____		CONDITION: fair
FILE NAME/ITEM#: AY2 PW220	DATA DISK#	TRANSDUCER: ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE ____		
Xo REF. POINT (Lo): ~1" from toe of weld	Yo REF. POINT (Wo): ~12" from riser & (28" cw from W8)	SCAN WIDTH: 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.500	0.490	NO	
2					.500	.485	NO	
3					.505	.490	NO	
4					.510	.488	NO	
5					.513	.490	NO	
6					.508	.490	NO	
7					.505	.490	NO	
8					.508	.490	NO	
9					.513	.493	NO	
10					.510	.498	NO	
SUMMARY MERGED RESULTS								

REMARKS
N/A

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION Hanford	SYSTEM DST TANK AY102	EXAM START 1900	EXAM END 2100	JOB # N/A
COMPONENT ID PRIMARY WALL PLATE 3, SCAN 2 0°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.75"
CONFIGURATION	TO PLATE 3	CALIBRATED RANGE 0.3 - 1.0"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 94.8	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# AY2PW320	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
X_0 REF. POINT (L_0) 1" from weld toe	Y_0 REF. POINT (W_0) 12" ccw of 24" Riser ℄	SCAN WIDTH 15"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					.748	.739	NO	
2					.748	.739	NO	
3		N/A			.752	.743	NO	N/A
4					.756	.743	NO	
5			N/A		.756	.743	NO	
6					.761	.734	NO	N/A
7					.761	.739	NO	
8					.769	.743	NO	
			N/A					
				N/A				
SUMMARY MERGED RESULTS								

REMARKS

N/A - Laminations detected throughout plate

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION Hanford	SYSTEM DST TANK A4102	EXAM START 1210	EXAM END 1330	JOB # N/A
COMPONENT ID PRIMARY WALL TOP TRANS. PLATE SCAN 2, 45°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 3/8"
CONFIGURATION TO TOP TRANS. PLATE SCAN 2-45°		CALIBRATED RANGE 0-2.56"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 36"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION FAIR
FILE NAME/ITEM# A42PWT24	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (Lo) 1" FROM HAUNCH WELD	Y_o REF. POINT (Wo) 15" ccw of 24" Riser ℄	SCAN WIDTH 15"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45	N/A	
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			N/A

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications										

REMARKS

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James B Eller	James B Eller	W H Nelson	14 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: HANFORD	SYSTEM: DST TANK A4102	EXAM START: 1330	EXAM END: 1630	JOB #: N/A
COMPONENT ID: PRIMARY WALL PLATE 1 SCAN 2, 45°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.5"
CONFIGURATION: PLATE 1, SCAN 2	TO	CALIBRATED RANGE: 0-TO 2.56"		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 115"	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER		CONDITION: FAIR
FILE NAME/ITEM#: A42PW124	DATA DISK#	TRANSDUCER: ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE Y5		
X_o REF. POINT (L_o): 1" from toe of weld	Y_o REF. POINT (W_o): ~12"CCW of 24° Riser &	SCAN WIDTH: 15"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45	N	
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			A

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications										

REMARKS
N/A

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James B Fuller	James B Fuller	W D Nelson	15 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: HANFORD	SYSTEM: DST TANK A4102	EXAM START: 1630	EXAM END: 1840	JOB #: N/A
COMPONENT ID: PRIMARY WALL PLATE 2, SCAN 2 45°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.5"
CONFIGURATION: TO PLATE 2, SCAN 2		CALIBRATED RANGE: 0 TO 2.56"		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 115.2"	SCAN LENGTH/PART: 12	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☐ CS OTHER		CONDITION
FILE NAME/ITEM#: A42PW224	DATA DISK#	TRANSDUCER: ☐ DUAL ☐ SGL ☐ 0DEG ☐ ANGLE		
X_o REF. POINT (L_o): 1" from weld	Y_o REF. POINT (W_o): ~12" CCW of 24" Riser ℄	SCAN WIDTH		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45	N/A	A
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications										

REMARKS
N/A

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: HANFORD	SYSTEM: DST TANK AY102	EXAM START: 1845	EXAM END: 2021	JOB #: N/A
COMPONENT ID: PRIMARY WALL PLATE 3, SCAN 2, 45°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.75
CONFIGURATION: PLATE 3, SCAN 2	TO	CALIBRATED RANGE: 0-2.56"		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 96"	SCAN LENGTH/PART: 12	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER		CONDITION: fair
FILE NAME/ITEM#: A42PW324	DATA DISK#	TRANSDUCER: ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (Lo): 1½" from to	Y_o REF. POINT (W_o): ~12" ccw of riser &	SCAN WIDTH: 15"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45		
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications.										

REMARKS
N/A

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: HANFORD	SYSTEM: DST TANK A4102	EXAM START: 1410	EXAM END: 1430	JOB #: N/A
COMPONENT ID: PRIMARY WALL, TOP TRANS. PLATE, SCAN 1, 45°	EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED			NOM. THICKNESS: 3/8"
CONFIGURATION: TOP TRANSITION PLATE SCAN 1	TO	CALIBRATED RANGE: 0-2.56"		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 36"	SCAN LENGTH/PART: 12	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER		CONDITION: fair
FILE NAME/ITEM#: A42PWT14	DATA DISK#	TRANSDUCER: ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (Lo): 1" from Hanuch WELD	Y_o REF. POINT (W_o): ~2 & 24" Riser	SCAN WIDTH		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45		
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications										

REMARKS

N/A

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James B Ellis	James B Ellis	W H Nelson	18 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION HANFORD	SYSTEM DST TANK AY 102	EXAM START 1515	EXAM END 1715	JOB # NA
COMPONENT ID PRIMARY WALL, PLATE 1, SCAN 6, 45°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.5"
CONFIGURATION TO PLATE 1		CALIBRATED RANGE 0.256" SP		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 115 ½"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION fair
FILE NAME/ITEM# AY2PW 114	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL. ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (L_o) 1" from weld toe	Y_o REF. POINT (W_o) ~ 7" CW of 24" Riser ℄	SCAN WIDTH 15"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45°		
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No	Crack like	Indications.								

REMARKS
N/A

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: HANFORD	SYSTEM: DST TANK A4102	EXAM START: 1815	EXAM END: 2015	JOB #: N/A
COMPONENT ID: PRIMARY WALL PLATE 2 SCAN 1, 45°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.5"
CONFIGURATION	TO: PLATE 2	CALIBRATED RANGE: 0-2.56" SP		TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 15.2"	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER		CONDITION: Fair
FILE NAME/ITEM#: A42PW214	DATA DISK#	TRANSDUCER: ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (Lo): 1" from weld toe	Y_o REF. POINT (Wo): ~7" CW of 24" Riser ℄	SCAN WIDTH: 15"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45°	N	
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			A

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications.										

REMARKS
N/A

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: Hanford	SYSTEM: DST TANK AY102	EXAM START: 2030	EXAM END: 2206	JOB #: N/A
COMPONENT ID: PRIMARY WALL, PLATE 3, Scan 1, 45°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.75"
CONFIGURATION: TO PLATE 3		CALIBRATED RANGE: 0-2.56" SP		TEMP: Ambient °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 93"	SCAN LENGTH/PART: 12	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER ____		CONDITION: Fair
FILE NAME/ITEM#: A42PW314	DATA DISK#	TRANSDUCER: ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (Lo): 1½" from weld toe (@taper)	Y_o REF. POINT (Wo): 7" CW of 24" Riser ℄	SCAN WIDTH: 15"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45		
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications										

REMARKS
N/A

Examiner	Analyst	Reviewer	Page
James B Elder	James B Elder	W D Nelson	21 of 30
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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION HANFORD	SYSTEM DST TANK AY102	EXAM START 1800	EXAM END 1900	JOB # N/A
COMPONENT ID PRIMARY WALL VERT WELD 3 0°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.75"
CONFIGURATION PLATE 3 TO PLATE 3		CALIBRATED RANGE 0.3" - 1.00"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 104.5"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# AY2PVW30	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
X_o REF. POINT (Lo) -1" down from Plate 2-3 weld	Y_o REF. POINT (Wo) Weld ℄	SCAN WIDTH 6"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					0.767	0.730	NO	
2					0.767	0.745	NO	
3					0.774	0.756	NO	
4		N			0.774	0.756	NO	N
5					0.778	0.745	NO	
6			A		0.774	0.748	NO	A
7					0.774	0.722	NO	
8					0.778	0.741	NO	
9					0.778	0.752	NO	
				N				
						A		
SUMMARY MERGED RESULTS								

REMARKS

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James B Ellen	James B Ellen	W D Nelson	22 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION HANFORD	SYSTEM DST- TANK AY102	EXAM START 1530	EXAM END 1616	JOB # N/A
COMPONENT ID PRIMARY WALL VERT WELD 3, 60°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.75"
CONFIGURATION PLATE 3	TO PLATE 3.	CALIBRATED RANGE 0-3.57"		TEMP °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 102"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION
FILE NAME/ITEM# AY2VW36A	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 60		
X_o REF. POINT (L_o)	Y_o REF. POINT (W_o) E of weld	SCAN WIDTH 5"		

SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1 45 DEGREE SHEAR		N	
2 60 DEGREE SHEAR	60°		
3 AATT			A
4 DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications										

REMARKS
Intermittent noise from surface roughness and/or probe(s) rocking up at toe of weld. Also weld geometry indications

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Donald V. Swain	James B Eller	W D Nelson	23 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION HANFORD	SYSTEM DST TANK A4102	EXAM START 1300	EXAM END 1330	JOB # N/A
COMPONENT ID PRIMARY WALL Vert. Weld 3 45°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.75"
CONFIGURATION PLATE 3 TO PLATE 3		CALIBRATED RANGE 0-2.56"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 102"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# A42VW34C	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45		
X_o REF. POINT (L_o)	Y_o REF. POINT (W_o) ℄ of weld	SCAN WIDTH 5"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45	N/A	
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications.										

REMARKS

Examiner Ronald V. Swain Level II Date 6-4-99

Analyst James B. Elder Level III Date 5/23/99

Reviewer W H Nelson Level III Date 6-4-99

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION: Hanford	SYSTEM: DST TANK AY102	EXAM START: 1900	EXAM END: 2010	JOB #: N/A
COMPONENT ID: PRIMARY WALL, VERT WELD 2 . 0°		EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS: 0.5"
CONFIGURATION: PLATE 2 TO PLATE 2		CALIBRATED RANGE: 0.3-1.0"		TEMP: °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 114.7"	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER ____		CONDITION: fair
FILE NAME/ITEM#: AY2PVW20	DATA DISK#	TRANSDUCER: ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE ____		
X_o REF. POINT (L_o): 1" below PLATE 1-2 WELD	Y_o REF. POINT (W_o): WELD ℄	SCAN WIDTH: 6"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
1					0.520	0.493	NO	
2					0.515	0.485	NO	
3					0.510	0.485	NO	
4					0.508	0.485	NO	
5					0.515	0.485	NO	
6					0.515	0.488	NO	
7					0.515	0.490	NO	
8					0.515	0.493	NO	
9					0.518	0.465	NO	
10					0.523	0.493	NO	
SUMMARY MERGED RESULTS								

REMARKS

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION: HANFORD	SYSTEM: DST TANK A4102	EXAM START: 1420	EXAM END: 1515	JOB #: N/A
COMPONENT ID: PRIMARY WALL VERT WELD 2, 60°	EXAMINATION SURFACE: ☒ OD ☐ ID ☐ PAINTED			NOM. THICKNESS: 0.5"
CONFIGURATION: PLATE 2 TO PLATE 2.	CALIBRATED RANGE: ~~0-3.5"~~ 0-3.51"			TEMP: AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED: 114"	SCAN LENGTH/PART: 12"	REF. LEVEL CORRECTION (TRANS. CORR): 0 DB		
PROCEDURE: SDI 2.1	REV: 3	MATERIAL TYPE: ☐ SS ☒ CS OTHER ____		CONDITION: fair
FILE NAME/ITEM#: A42VW26A	DATA DISK#	TRANSDUCER: ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 60		
X_o REF. POINT (L_o)	Y_o REF. POINT (W_o): ℄ of weld.	SCAN WIDTH		

SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1 45 DEGREE SHEAR			
2 60 DEGREE SHEAR	60		
3 AATT			
4 DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications.										

REMARKS
Intermittent noise from rough surface and/or probe(s) rocking up at toe of weld. Also had weld geometry indications.

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Donald V. Swain	James B. Elder	W. D. Nelson	25 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION HANFORD	SYSTEM DST TANK AY102	EXAM START 1200	EXAM END 1245	JOB # N/A
COMPONENT ID PRIMARY WALL VERT WELD 2. 45°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.5
CONFIGURATION PLATE 2 TO PLATE 2.		CALIBRATED RANGE 0-2.5		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 113.28	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# AY2VW24C	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45°		
X_o REF. POINT (L_o)	Y_o REF. POINT (W_o) ℄ of weld	SCAN WIDTH 5"		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45		
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Cracklike Indications.										

REMARKS

Examiner Ronald V. Swain Level II Date 6-4-99

Analyst James B. Ellis Level III Date 5/23/99

Reviewer W. H. Nelson Level III Date 6-4-99 COGEMA

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AUTOMATED ULTRASONIC THICKNESS DATA REPORT

REPORT# N/A
REF. CAL. # N/A

LOCATION HANFORD	SYSTEM DST TANK A4102	EXAM START 1410	EXAM END 1630	JOB # N/A
COMPONENT ID PRIMARY WALL PLATE HORZ WELD 3, 0°		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.5"
CONFIGURATION PLATE 1 TO PLATE 2. HORZ Weld 3.		CALIBRATED RANGE 0.3 - 1.0"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 293" (24'4")	SCAN LENGTH/PART	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION Fair
FILE NAME/ITEM# A42PHW30	DATA DISK#	TRANSDUCER ☒ DUAL ☐ SGL ☒ 0DEG ☐ ANGLE		
Xo REF. POINT (Lo) 33" cw from Plate1 Vert. (~112½')	Yo REF. POINT (Wo) Weld ℄	SCAN WIDTH 6"		

PART # / INDICATION	L START	L STOP	W START	W STOP	AVE. THK.	MIN. THK, R. LIG.	AREA REPORTABLE	COMMENTS
A42PHW30 .1					.508	.493	NO	
" .2					.508	.490	NO	
" .3					.508	.490	NO	
" .4					.520	.498	NO	
" .5					.520	.498	NO	
" .6					.518	.498	NO	
" .7					.525	.500	NO	
" .8					.525	.500	NO	
" .9					.515	.485	NO	
" .10					.515	.498	NO	
" .11					.523	.498	NO	
" .12					.523	.500	NO	
" .13					.515	.493	NO	
" .14					.523	.500	NO	
" .15					.525	.508	NO	
" .16					.520	.508	NO	
" .17					.518	.498	NO	
" .18					.520	.500	NO	
" .19					.523	.505	NO	
" .20					.523	.500	NO	
A42PHW30 .21					.523	.505	NO	
SUMMARY MERGED RESULTS				* .22 .23 .24 .25	.515 .515 .518 .520	.498 .500 .500 .505	NO NO NO NO	

REMARKS

* Scan to 293" (24+ feet) to include weld repairs in examination area.
Repairs at 258-266" and 281-291"
Plate 1 vert. weld at 34" (~112½'), Plate 2 Vert. weld at 270" (132' mark)

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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION HANFORD	SYSTEM DST TANK AY102	EXAM START 1015	EXAM END 1301	JOB # N/A
COMPONENT ID PRIMARY WALL HORZ. WELD 3, 60° AX.		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS 0.5"
CONFIGURATION PLATE 1 TO PLATE 2		CALIBRATED RANGE 0-2.58"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 288"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION fair
FILE NAME/ITEM# AY2HW36A	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 60°		
X_o REF. POINT (L_o)	Y_o REF. POINT (W_o) ℄ of weld	SCAN WIDTH 5"		

SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1 45 DEGREE SHEAR			
2 60 DEGREE SHEAR	60°		
3 AATT			
4 DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Crack like Indications.										

REMARKS

Intermittent noise from surface roughness and/or probe(s) rocking up at toe of weld. Also weld geometry indications. RR

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Ronald V. Swain	James B. Eller	COGEMA	29 of 30
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ULTRASONIC P-SCAN DATA REPORT

REPORT # N/A

LOCATION HANFORD	SYSTEM DST TANK AY102	EXAM START 1000	EXAM END 1130	JOB # N/A
COMPONENT ID PRIMARY WALL HORZ. WELD 3, 45° CIRC.		EXAMINATION SURFACE ☒ OD ☐ ID ☐ PAINTED		NOM. THICKNESS .05"
CONFIGURATION PLATE 1 TO PLATE 2		CALIBRATED RANGE 0-2.56"		TEMP AMBIENT °F
CIRCUMFERENCE/TOTAL LENGTH EXAMINED 240"	SCAN LENGTH/PART 12"	REF. LEVEL CORRECTION (TRANS. CORR) 0 DB		
PROCEDURE SDI 2.1	REV 3	MATERIAL TYPE ☐ SS ☒ CS OTHER		CONDITION fair
FILE NAME/ITEM# AY2 HW34C	DATA DISK#	TRANSDUCER ☐ DUAL ☒ SGL ☐ 0DEG ☒ ANGLE 45°		
X_o REF. POINT (L_o)	Y_o REF. POINT (W_o) 0@ ℄ of weld	SCAN WIDTH		

	SIZING METHOD	ANGLE	REFERENCE CAL. SHEET	SET-UP
1	45 DEGREE SHEAR	45°		
2	60 DEGREE SHEAR			
3	AATT			
4	DUAL 0 DEGREE			

INDICATION INFORMATION

IND	METHOD	WELD SIDE	DEPTH R. LIG.	MAX AMP	L1	LENGTH	L2	W1	WIDTH	W2	INDICATION TYPE
	No Cracklike Indications.										

REMARKS

Examiner Ronald V. Swain Level II Date 5/15/99

Analyst James B. Fuller Level III Date 5/23/99

Reviewer W.D. Nelson Level III Date 6-4-99 COGEMA

DISTRIBUTION SHEET

To	From	Page 1 of 1
Distribution	Tank Systems Integrity Engr'g	Date 7/21/99
Project Title/Work Order: Final Results of Double-Shell Tank 241-AY-102 Ultrasonic Inspection		EDT No. 623398
		ECN No.

Name	MSIN	Text With All Attach.	Text Only	Attach./ Appendix Only	EDT/ECN Only
R. P. Anantatmula	R1-30	x			
D. L. Becker	R3-73	x			
B. G. Erlandson	R1-51				x
E. A. Fredenburg	R1-56	x			
H. R. Hopkins, III	R2-58	x			
C. E. Jensen	R1-56	x			
L. J. Julyk	R1-56	x			
P. C. Miller	R1-51	x			
E. A. Nelson	L6-38	x			
M. A. Payne	R2-58				x
D. C. Pfluger	R1-56	x			
R. S. Popielarczyk	R2-58				x
R. W. Powell	R3-75	x			
W. J. Powell	G1-54	x			
D. S. Rewinkel	S7-40	x			
S. H. Rifaey	R1-56	x			
W. E. Ross	R2-50	x			
D. B. Smet	R1-56	x			
T. B. Veneziano	S7-40	x			
K. A. White	S5-13	x			
D. G. Baide	S5-05	x			
M. L. Dexter	R1-51	x			
E. E. Mayer	R2-50				x
A. F. Pardini	K5-26	x			
G. J. Posakony	K5-26	x			