

## IR 0553792-02, Drywell Structural Integrity Basis from 1R21 Inspections

### Reasons for Evaluation/Scope

The purpose of this Technical Evaluation is to present current and projected (until 1R22) margin in Drywell Vessel Thicknesses and the bases to further confirm that the drywell structural integrity continues to maintain design basis requirements as established in references 1 through 3. The intent of this evaluation is to demonstrate that the Drywell Vessel thicknesses are adequate to satisfy current licensing and design bases requirements.

This Technical Evaluation was developed in accordance with CC-AA-309-101, Revision 7.

A prejob brief for this Technical Evaluation was performed by Howie Ray in accordance with HU-AA-1212 Rev 1. The risk rank of this Technical Evaluation was concluded to be a "4", since the acceptance criteria have already been established and approved through existing design analysis. Therefore a third party review is not required.

### Background

In the 1R21 Outage a series of UT thickness measurements were performed of various elevations of the Drywell Vessel in accordance with specification OC-IS -328277-004. The purpose of these UT inspections is to measure corrosion rates of the Drywell Vessel and further confirm that the vessel meets the design basis.

This is accomplished by inspecting the same locations over time.

In the mid 1980's a survey was performed of the Drywell Vessel at the Sandbed elevation (11' 3"). As a minimum at least one inspection location (also referred to as a grid) was selected in each of the 10 Drywell Bays and permanently marked. These were then selected for repeat inspection and entered into the Drywell Thickness Monitoring Program.

UT Inspection of locations with the most thinning consisted of obtaining 49 individual UT thickness readings in a 7 by 7 pattern spaced on 1 inch centers. These measurements were taken using a stainless steel template. The template was designed to ensure that the 7 by 7 grid is located in the same area with repeatability of a 1/16".

The program then performed UT inspections over time at these same locations from 1987 to 1996.

The corrosion rates were developed using a standard regression analysis and establishment of the 95% confidence intervals to capture increasing variance depending on the projection of ongoing corrosion and the number of inspections. This methodology is based on the following references:

- 1) Applied Regression Analysis, Second Edition, N.R. Draper & H. Smith, John Wiley and Sons 1981
- 2) Statistical Concept and Methods, G.K. Bhattacharyya & R.A. Johnson, John Wiley and Sons 1977,

- 3) Experimental Statistics, Mary Gobbons Natrella, John Wiley and Sons 1966 (Reprint National Bureau of Standards Handbook 91)
- 4) Fundamental Concepts in the Design of Experiments, Charles C Hicks, Saunders College Publishing, Fort Worth, 1982

Each time UT inspections are performed the distribution of the individual readings is checked to confirm the original distribution evaluation.

Inspections of the Drywell above the sandbed have been performed up to 2006. Corrosion rates have been calculated in calculation C-1302-187-E310-037 Revision 2 and ECR 05-00575.

Corrosion in the sand bed region was addressed by removing sand, water, and corrosion byproduct in the sandbed and applying a coating on the exterior of the vessel in 1992.

Comparison of UT inspections performed in 1992 and 1994 as documented in C-1302-187-5300-030 shows that the sandbed region continues to meet design basis requirements.

This Technical Evaluation will compare the 2006 UT inspection data to these earlier calculations to further confirm conclusion that the drywell vessel continues to meet design basis.

#### Detailed Evaluation

##### Methodology

C-1302-187-E310-037 Revision 2 and C-1302-187-5300-030 identify the locations which are the most critical with respect to thinning (see table 1). These are located at five different elevations 11' 3, 50' 2", 51' 10", 60' 10", and 87' 5".

These calculations developed corrosion rate projections for these critical locations. The mean of the 2006 inspection of the same critical locations plotted on the earlier projections to determine if those projections are still valid and bound the current inspection results.

##### Elevation 11' 3

Refer to the data in attachment 3 and the projection curve for location 19A in attachment 2.

Calculation C-1302-187-5300-030 identified location 19A as the most critical since it was the thinnest area in the sandbed. However the calculation concluded with 95% confidence that this location and the other sandbed region locations were not experiencing corrosion. Figure 1 provides a trend of the mean values for this location. Figure 1 also provides curves showing the calculated standard error of plus or minus 0.0034 inches for the means. The 2006 mean is also plotted on figure 1 and shows that this value is well within the standard error band.

Table 1 provides a breakdown of the mean thickness measured in 2006 and associated current margin.

#### Elevation 50' 2"

Refer to the data in attachment 3 and the projection curves for locations 5-5 and 13-23 in attachment 2.

The 2004 calculation identified locations 5-5HI and 15-23HI as the most critical since they were the thinnest at this elevation. The calculation concluded that these locations are experiencing corrosion rates of 0.0003 and 0.0004 inches per year with 95% confidence. Figure 2 and Figure 3 provide trends of the means of data collected from 1987 through 2004 for these locations taken from calculation C-1302-187-E310-037 Revision 2. The 2006 means for each location are plotted on these figures. These show that the 2006 means are consistent with and are bounded by the 2004 projections. Therefore the margins and projections from 2004 remain valid and bounding. Table 1 provides the means and margin calculated in 2004.

Table 1 provides a breakdown of the mean thickness measured in 2004 and associated current margin for these two locations.

#### Elevation 51' 10"

Refer to the data in attachment 3 and the projection curve for location 13-32 in attachment 2.

The 2004 calculation identified location 13-32 as the most critical since it was the thinnest at this elevation. However the calculation concluded with 95% confidence that the location was not experiencing corrosion. Figure 4 provides a trend of the means of data collected from 1987 through 2004 for this location taken from calculation C-1302-187-E310-037 Revision 2. The 2006 mean for this location is plotted on this figure. Figure 4 also provides curves showing the 2004 calculated standard error of  $\pm 0.0053$  inches for the data from 1987 to 2004. The 2006 mean is well within the 2004 standard error band.

This shows that the 2006 mean is consistent with and bounded by the 2004 projection, which concluded that this location is not corroding. Therefore the margin and projection from 2004 remains valid and bounding. Table 1 provides the means and margin calculated in 2004.

Table 1 provides a breakdown of the mean thickness measured in 2004 and associated current margin.

#### Elevation 60' 10"

Refer to the data in attachment 3 and the projection curve for location 5-22 in attachment 2.

The 2004 calculation identified location 5-22 as the most critical since it was the thinnest at this elevation. However the calculation concluded with 95% confidence that the location was not experiencing corrosion. Figure 5 provides a trend of the means of data collected from 1992 through 2004 for these locations taken from calculation C-1302-187-E310-037 Revision 2. The

2006 mean for this location is plotted on this figure and shows that this value has virtually not changed since 2004.

Figure 4 also provides curves showing the 2004 calculated standard error of the data from 1987 to 2004. The 2006 mean is well within the 2004 standard error band.

Table 1 provides a breakdown of the mean thickness measured in 2004 and associated current margin

Elevation 87' 5"

Refer to the data in attachment 3 and the projection curve for location 9-20 in attachment 2.

The 2004 calculation identified location 9-20 as the most critical since it was the thinnest at this elevation. The calculation concluded that this location was experiencing a corrosion rate of 0.00075 inches per year with 95% confidence. Figure 6 provides the trend of the means of data collected from 1987 through 2004 for these locations taken from calculation C-1302-187-E310-037 Revision 2. The 2006 mean for this location is plotted on this figure. This shows that the 2006 mean is consistent with and is bounded by the 2004 projection. Therefore the margin and projection from 2004 remain valid and bounding. Table 1 provides the means and margin calculated in 2004.

Table 1 in attachment 1 provides a breakdown of the mean thickness measured in 2004 and associated current margin for these two locations.

Bay 15 Grid at Elevation 71' 6"

In 1R21 Oyster Creek performed first time inspections of two 6" by 6" areas above the transition weld at elevation 71' 6". The results of the 6" by 6" area in bay 15 showed several local readings less than the inspection specification acceptance criteria (ref. 4). The intent of the criteria in the specification was to provide a low threshold for inspection results so that unexpected readings would be evaluated. As a result IR 00556049 was issued. Review of the inspection results showed that the thinnest local reading was 0.449 inches.

The inspection specification criteria were purposefully set well above the design basis criteria. The minimum required design basis local thickness for this elevation is 0.300 inches (reference 2). Therefore the as found thickness at this location meets the design basis requirements. In addition even when assuming a 1 mil per year corrosion rate, this location will continue to meet design basis until well past 2008. Comparison of this new location to an existing monitored location that has been determined to be the most critical for the plates at this elevation (location 9-20) shows that the projections for the previously monitored location are bounding (refer to attachment 3 page 11).

Bay 17 Grid at Elevation 23' 6"

In 1R21 Oyster Creek performed first time inspections of two 6" by 6" areas above the transition weld at elevation 23' 6". The results of the 6" by 6" area in bay 17 showed several local readings

less than the inspection specification acceptance criteria (ref. 4). The intent of the criteria in the specification was to provide a low threshold for the inspection results so that unexpected readings would be evaluated. As a result IR 00548459 was issued. Review of the inspection results showed that the thinnest local reading was 0.628 inches.

The inspection specification criteria were purposefully set well above the design basis criteria. The minimum required design basis local thickness for this elevation is 0.360 inches (reference 2). Therefore the as found thickness at this location meets the design basis requirements. In addition even when assuming a 1 mil per year corrosion rate, this location will continue to meet design basis until well past 2008. Comparison of this new location to an existing monitored location that has been determined to be the most critical for the plates at this elevation (location 15-23) shows that the projections for the previously monitored location are bounding (refer to attachment 3 page 14).

### Conclusions

Table 1 demonstrates that current and projected margin in critical Drywell Vessel locations based on the comparison of recently obtained 2006 UT data and previously approved calculations remain adequate to continue to satisfy design bases requirements until 1R22. Comparison of the 2006 data to previously approved calculations, demonstrates that the conclusions in the previous calculations are still bounding the current data.

### References

- 1) C-1302-187-E310-037 Revision 1
- 2) ECR 05-00575
- 3) C-1302-187-5300-030 Revision 1
- 4) Specification IS-328227-004 Rev. 13

### Attachments

- 1) Margin Table - 1 page
- 2) Review of 2006 means value to previous projections - 6 pages
- 3) Drywell UT Inspection Data - 16 pages

**Summary of Oyster Creek Drywell Corrosion Monitoring Program Controlling Locations**

Elevation/ Plate (Nominal Thickness Inches)	Location with Mean thinnest	Measur ement (inches)	When	Criteria	Margin in 2006	Percent	Measured Corrosion Rate.  Inches/ year	Preliminary Projected margin in 2029 based on 95% confidence interval around the corrosion rate	Reference
11' 3" (1.154")	19A	0.8066	10/2006	0.736	0.0706	9.6%	None	9.6%	C-1302-187- 5300-030
50' 2" (0.770")	Bay 5 Location 5-HI	0.7556	10/2004	0.541	0.2146	39.7%	0.0003	36.5%	C-1302-187- E310-037 Rev 2
50' 2" (0.770")	Bay 15 Location 23-HI	0.7573	10/2004	0.541	0.2163	40%	0.0004	36.4%	C-1302-187- E310-037 Rev 2
51' 10" (0.772")	Bay 13 Location 32 Lo	0.6872	10/2004	0.518	0.1692	32.7%	None	32.7%	C-1302-187- E310-037 Rev 2
60' 10" (0.722")	Bay 5 Location 22	0.6928	10/2004	<u>0.518</u>	0.1748	33.7%	None	33.7%	C-1302-187- E310-037 Rev 2
87' 5" (0.640")	Bay 9 location 20	0.6123	10/2004	0.452	0.1603	35.4%	0.00075	33.6%	C-1302-187- E310-037 Rev 2

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Attachment 1

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Prepared by Pete Tamburro

I have performed an independent technical review of this technical evaluation in accordance with Section 4.3 of CC-AA-309-101, Revision 7. I have confirmed the correctness of the inputs, mathematics, and outputs. I have verified the methodology and compliance with design bases criteria are appropriate. The results accomplish the stated purpose.

Independent Review By Frank Stulb

Date: 11/06/06

**Manager Comments:**

This technical evaluation was prepared and reviewed by qualified personnel to provide a summary of the 1R21 Drywell Inspection results performed in 2006. The conclusions demonstrate that the structural integrity of the drywell shell, based on its measured thickness at representative locations, remains acceptable based on the previously approved methodologies and acceptance criteria.

Approved for Use: Ray, F.H. 11/6/2006.

Subject:  
Drywell Corrosion

Calc. No. Rev. No.  
C-1301-187-E310-LATER037

System No.  
187

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Attachment 2  
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$$F_{\text{actaul}} := \frac{\text{MSR}}{\text{MSE}}$$

$$\alpha := 0.05$$

$$F_{\text{critical}} := \text{qF}(1 - \alpha, \text{DegreeFree}_{\text{reg}}, \text{DegreeFree}_{\text{ss}})$$

$$F_{\text{ratio}} := \frac{F_{\text{actaul}}}{F_{\text{critical}}}$$

$$F_{\text{ratio}} = 1.715 \cdot 10^{-3}$$

Therefore the curve fit of the means does not have a slope and the grandmean is an accurate measure of the thickness at this location

$$i := 0.. \text{Total means} - 1$$

$$\mu_{\text{grand measured}_i} := \text{mean}(\mu_{\text{measured}})$$

$$\sigma_{\text{grand measured}} := \text{Stdev}(\mu_{\text{measured}})$$

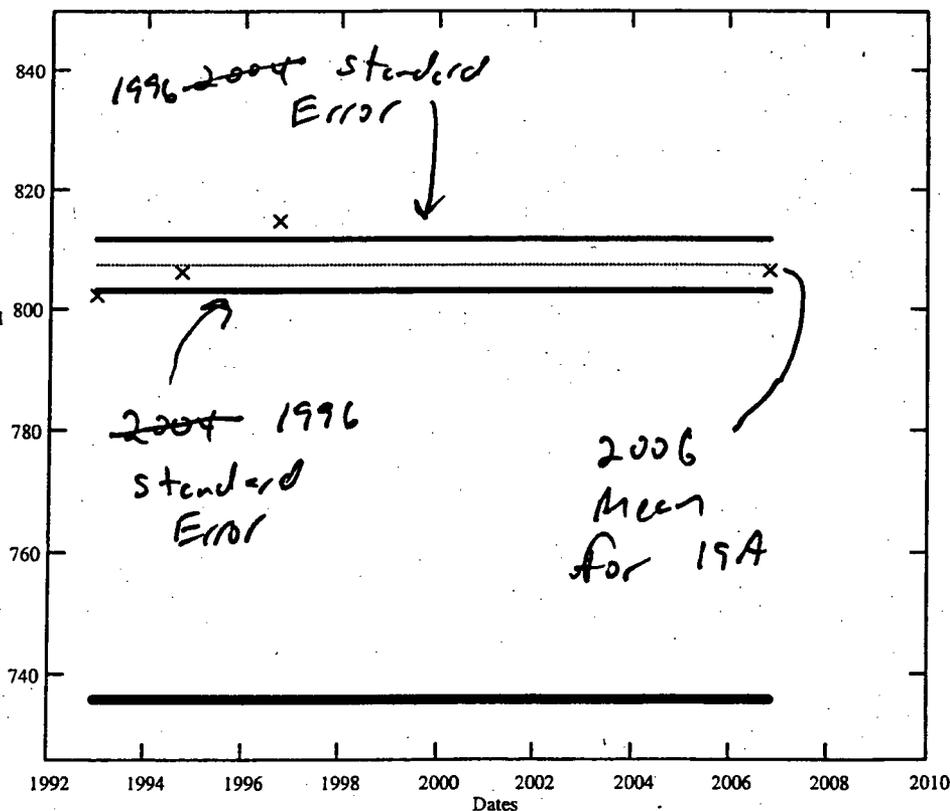
$$\text{GrandStandard error}_0 := \frac{\sigma_{\text{grand measured}}}{\sqrt{\text{Total means}}}$$

The minimum required thickness at this elevation is  $T_{\text{min\_gen SB}} := 736$  (Ref. Calc. SE-000243-002)

Plot of the grand mean and the actual means over time

Figure 1

- $\mu_{\text{measured}}$
- x x x
- $\mu_{\text{grand measured}}$
- $T_{\text{min\_gen SB}}$
- $\sigma_{\text{medown}}$
- $\sigma_{\text{meup}}$



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Drywell Corrosion

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From ↑

upper<sub>f</sub> := Thick predict<sub>f</sub> ...

$$+ qt \left( 1 - \frac{\alpha_t}{2}, \text{Total means} - 2 \right) \cdot \text{Standard error} \sqrt{1 + \frac{1}{(d+1)} + \frac{(\text{year predict}_f - \text{Thick actualmean})^2}{\text{sum}}}$$

lower<sub>f</sub> := Thick predict<sub>f</sub> ...

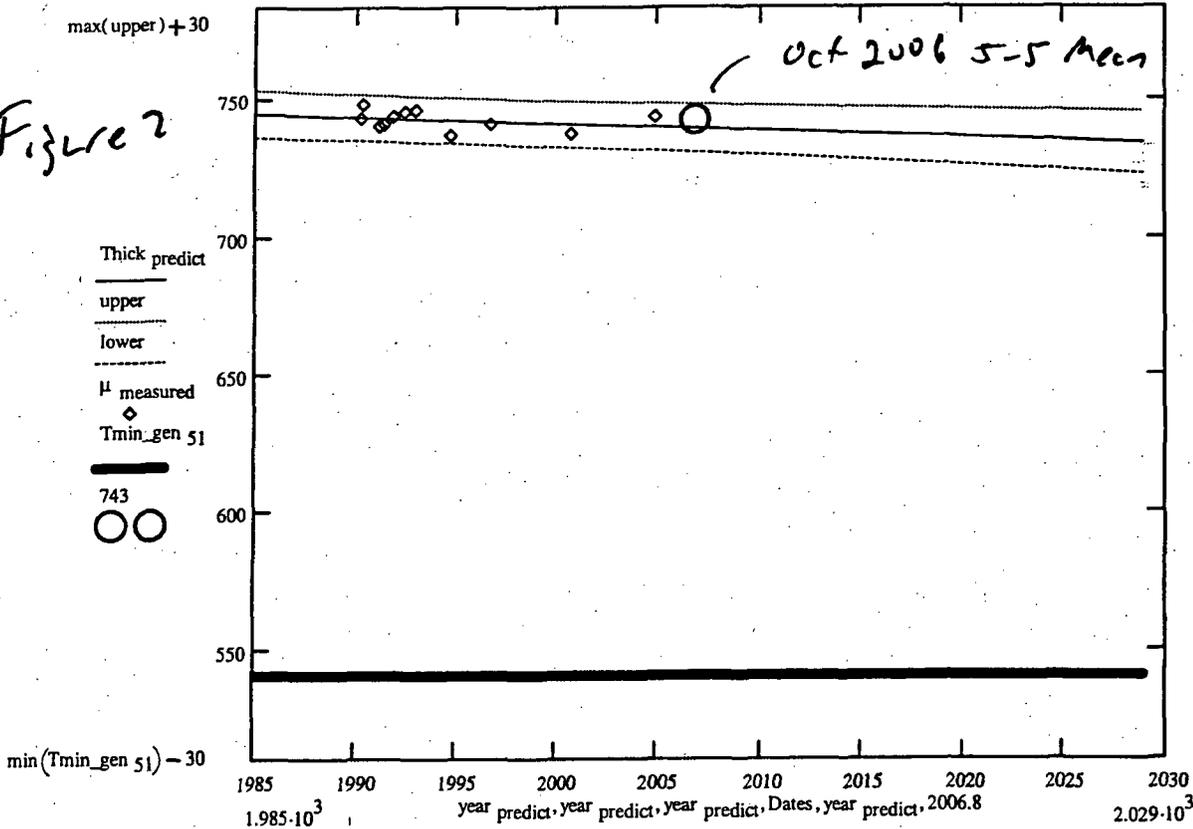
$$- \left[ qt \left( 1 - \frac{\alpha_t}{2}, \text{Total means} - 2 \right) \cdot \text{Standard error} \sqrt{1 + \frac{1}{(d+1)} + \frac{(\text{year predict}_f - \text{Thick actualmean})^2}{\text{sum}}} \right]$$

General area Tmin for this elevation in the Drywell

Tmin\_gen 51<sub>f</sub> := 541 (Ref. Calc. SE-000243-002)

m<sub>s</sub> = -0.246

Figure 2



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Attachment 2  
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Bay 15 Area 23  
 Subject:  
 Drywell Corrosion

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~~1~~  
 2

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For the thicker points

$$\text{upper}_f := \text{Thick\_highpredict}_f \dots$$

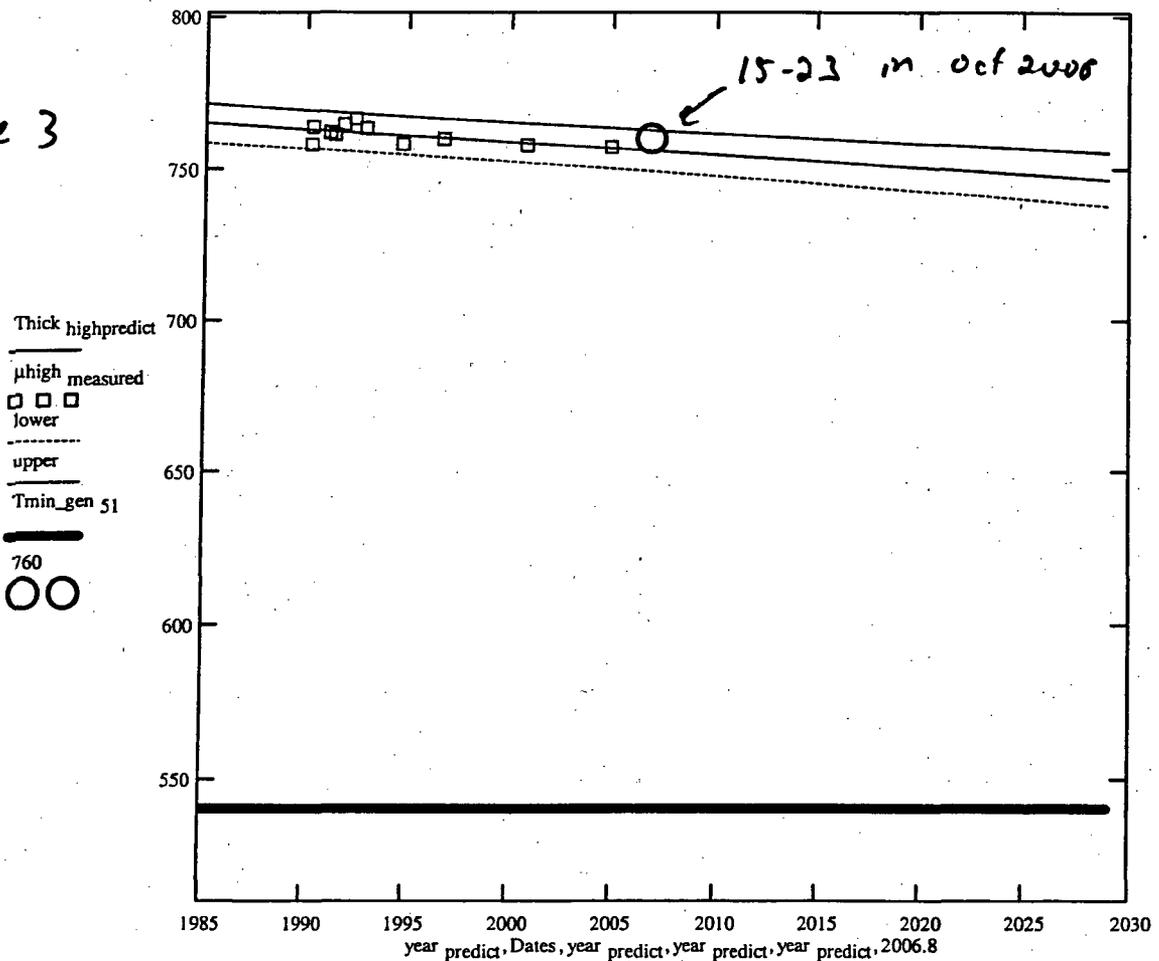
$$+ qt \left( 1 - \frac{\alpha_t}{2}, \text{Total means} - 2 \right) \cdot \text{Standard\_higherror} \sqrt{1 + \frac{1}{(d+1)} + \frac{(\text{year\_predict}_f - \text{Thick\_actualmean})^2}{\text{sum}}}$$

$$\text{lower}_f := \text{Thick\_highpredict}_f \dots$$

$$- \left[ qt \left( 1 - \frac{\alpha_t}{2}, \text{Total means} - 2 \right) \cdot \text{Standard\_higherror} \sqrt{1 + \frac{1}{(d+1)} + \frac{(\text{year\_predict}_f - \text{Thick\_actualmean})^2}{\text{sum}}} \right]$$

$m_{\text{highs}} = -0.418$

Figure 3



Bay 13 Area 32  
Subject:  
Drywell Corrosion

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Standard error

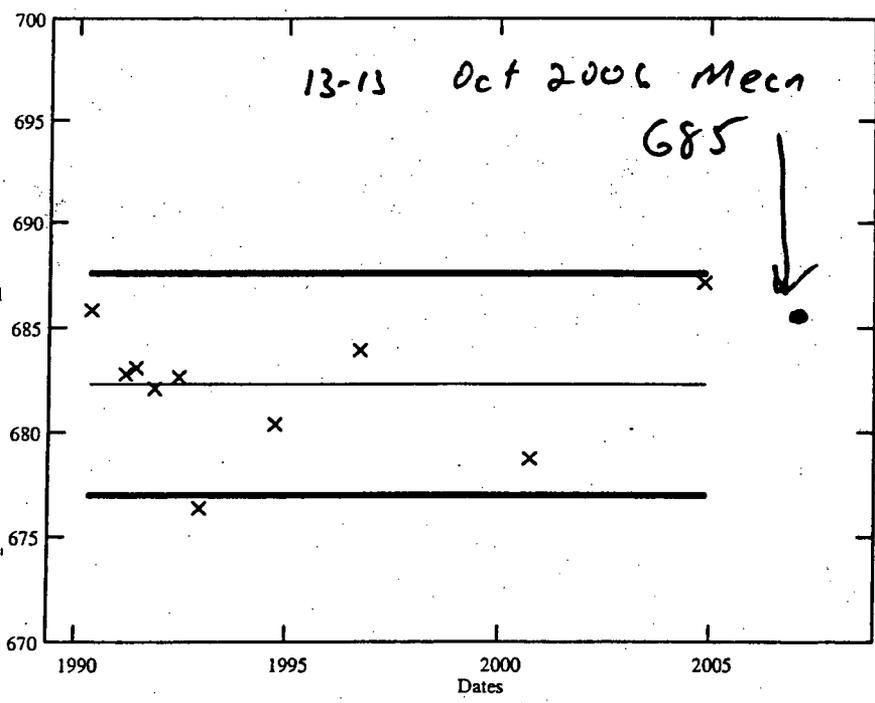
$$\frac{\text{mean}(\sigma_{\text{low measured}})}{\sqrt{\text{Total means}}} = 5.291$$

$$\sigma_{g \text{ medown}} := \mu_{\text{lowgrand measured}} - \frac{\text{mean}(\sigma_{\text{low measured}})}{\sqrt{\text{Total means}}}$$

$$\sigma_{g \text{ meup}} := \mu_{\text{lowgrand measured}} + \frac{\text{mean}(\sigma_{\text{low measured}})}{\sqrt{\text{Total means}}}$$

Figure 4

Location 13-13



Bay 1 Area 50-22  
Subject:  
Drywell Corrosion

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1/2

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Flow

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A# 2  
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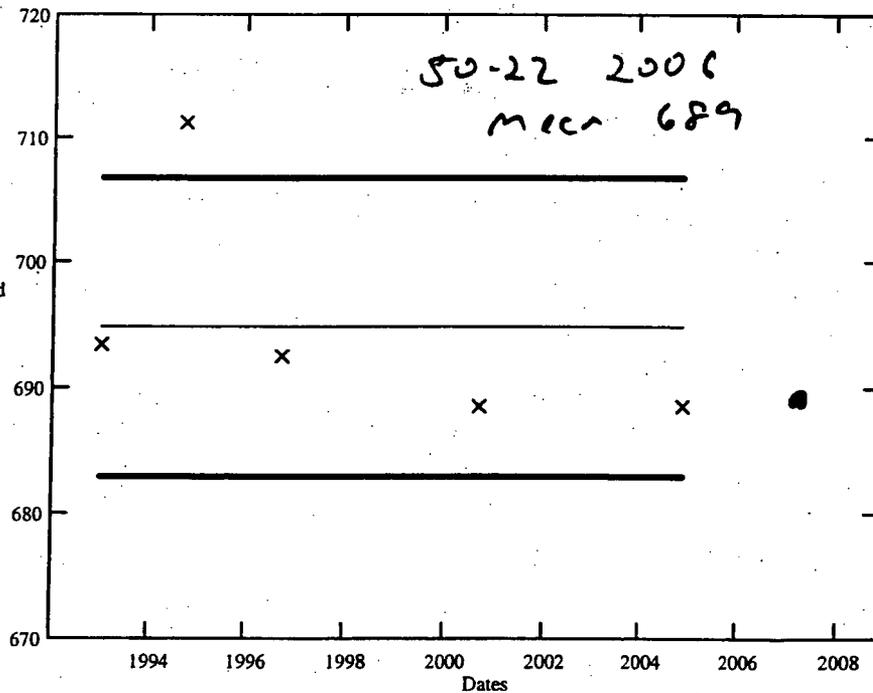
Standard error

$$\frac{\text{mean}(\sigma \text{ measured})}{\sqrt{\text{Total means}}} = 11.865$$

$$\sigma g_{\text{medown}} := \mu_{\text{grand measured}} - \frac{\text{mean}(\sigma \text{ measured})}{\sqrt{\text{Total means}}}$$

$$\sigma g_{\text{meup}} := \mu_{\text{grand measured}} + \frac{\text{mean}(\sigma \text{ measured})}{\sqrt{\text{Total means}}}$$

Figure 5



Bay 9 Area 20  
Subject:  
Drywell Corrosion

Calc. No.  
C-1301-187-E310-037

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1/2

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FROM →

The minimum required thickness at this elevation is  $T_{min\_gen\ 86} = 452$  (Ref. Calc. SE-000243-002)

Location Curve Fit Projected to Plant End Of Life

$m_s = -0.754$

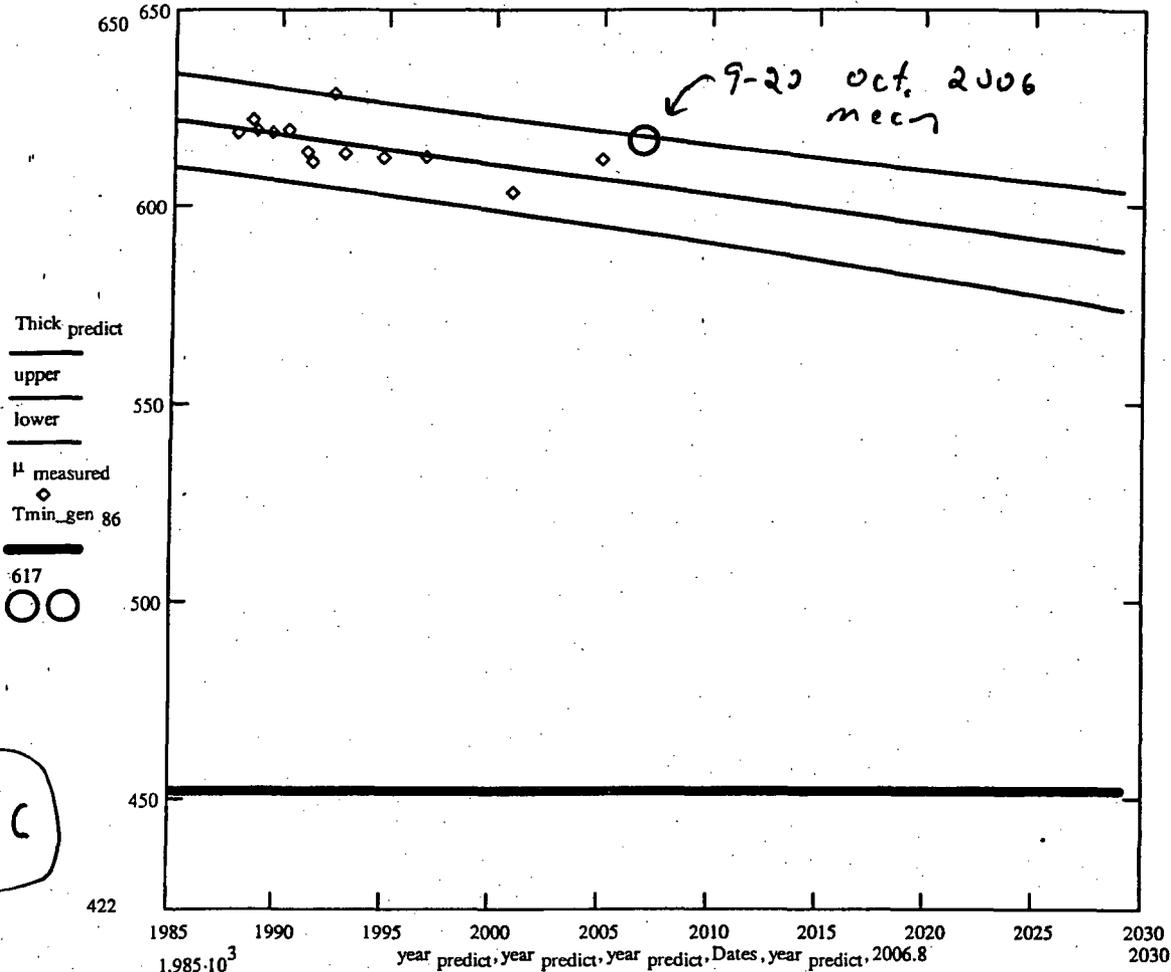


Figure C

$year_{predict_{12}} = 2.009 \cdot 10^3$

$Thick_{predict_{12}} = 604.115$

Therefore the regression model shows that even at the lower 95% confidence band this location will not corrode to below Drywell Vessel Minimum required thickness by the plant end of life.

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Att 2  
Case 606

No Pits have been identified for this location

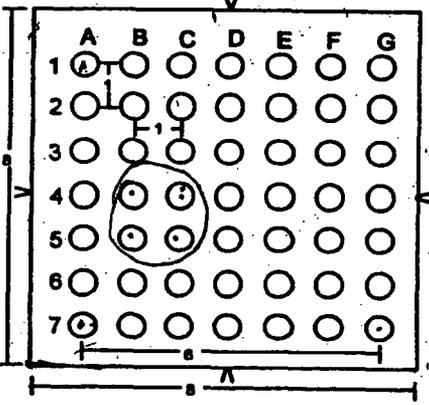
General Electric	<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek		Date:	10/18/2008
Refueling Outage - 1R21		UT Procedure:	ER-AA-335-004
Page 1 of 5		Specification:	IS-328227-004

Examiner: Matt Wilson	Level: II	Instrument Type:	Panametrics 37DL Plus
Examiner: Leslie Richter	Level: II	Instrument No:	031125409
Transducer Type: DV 506	Serial #: 072561	Size: 0.438"	Freq: 5 Mhz
Transducer Cable Type: Panametrics	Length: 5'	Couplant: Soundsafe	Batch No: 19620
Calibration Block Type: C/S Step Wedge	Block Number: CAL-STEP-088		

SYSTEM CALIBRATION			
INSTRUMENT SETTINGS	Initial Cal. Time	Calibration Checks	Final Cal. Time
Coarse Range: 2.0"	10:00	See Data	14:32
Coarse Delay: N/A	Calibrated Sweep Range = 0.300" Inches to 1.500" Inches		
Delay Calib: N/A	Thermometer: 246647	Comp. Temp: 72°	Block Temp: 81°
Range Calib: N/A	W/O Number: R2090917		
Instrument Freq: N/A	Total Crew Dose: 254 mr	Drywell Containment Vessel Thickness Examination. Internal UT Inspections.	
Gain: 67 db			
Damping: N/A			
Reject: N/A			
Filter: N/A			

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Case 1 of 4  
AH3

Template aligned to V Stamps.  
Thickness readings taken at holes located in template.



*excluded*

Location ID	9D			Bay	9	Elev.	11' 3"
	A	B	C	D	E	F	G
1	1.005	1.068	0.985	1.133	1.132	1.136	1.101
2	<del>0.896</del>	0.927	1.067	1.037	0.974	1.077	1.069
3	<del>0.751</del>	0.883	0.975	1.071	1.033	1.105	1.123
4	0.885	0.993	0.949	0.984	0.995	1.022	1.041
5	0.980	0.968	0.936	0.942	0.880	0.927	0.998
6	0.960	0.869	0.976	0.987	0.967	0.965	0.949
7	0.968	0.967	0.963	1.004	0.947	0.892	0.943

Calibration Check: 10:15	
Tscr.	AVG.
.628	0.988

Location ID	11A			Bay	11	Elev.	11' 3"
	A	B	C	D	E	F	G
1	0.905	0.832	0.829	0.803	0.830	0.812	0.737
2	0.797	0.825	0.834	0.822	0.858	0.783	0.795
3	0.720	0.766	0.858	0.731	0.762	<del>0.669</del>	0.764
4	0.739	<del>1.047</del>	<del>1.057</del>	0.806	0.761	0.821	0.849
5	0.843	<del>1.090</del>	<del>1.104</del>	0.879	0.879	0.854	0.817
6	0.741	0.897	0.818	0.890	0.907	0.833	0.826
7	0.875	0.869	0.923	0.886	0.871	0.810	0.842

COMMENTS:  
Core Plug located at C04, C05, B04, B05.  
*excluded*

Calibration Check: 10:32	
Tscr.	AVG.
.628	0.846

*Simple ARITHMETIC Avg.*

COMMENTS: File Specific Comments located to right of readings.  
Location ID 11C: The following template holes were painted onto the plate using the template. The readings were then taken with the template removed. This was done due to the Drywell Vent Attachment weld obstructing the template. Row 1 A through G, Row 2 A through C, Row 7 C through D.

*EXERON L III M/M/AL 10-20-06*

General Electric	<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek		Date:	10/18/2008
Refueling Outage - 1R21		UT Procedure:	ER-AA-335-004
Page 2 of 5		Grid Procedure:	IS-328227-004

Location ID	11C			Bay	11	Elev.	11' 3"	Calibration Check: 10:46	
	A	B	C	D	E	F	G		
1	OBST.	0.771	0.803	0.912	0.767	0.858	0.886	<b>COMMENTS:</b> A01 obstructed due to D.W Vent attachment weld. B01 reading taken adjacent to D.W. attachment weld. See Comments above.	
2	1.056	1.046	0.984	1.094	1.036	1.118	1.029		
3	1.073	1.113	1.002	0.935	0.942	0.888	0.853		
4	0.837	0.836	0.790	0.874	0.834	0.846	0.838		
5	0.850	0.825	0.869	0.889	0.833	0.866	0.875		
6	0.856	0.840	0.864	0.829	0.872	0.876	0.844		
7	0.861	0.877	0.879	0.885	0.880	0.849	0.876		
								Tscr.	AVG.
								.628	0.898

Location ID	13A			Bay	13	Elev.	11' 3"	Calibration Check: 11:02	
	A	B	C	D	E	F	G		
1	0.887	0.833	0.887	0.908	1.046	0.951	0.922	553792-02 1050 2 AH 3	
2	0.823	0.883	0.774	0.826	0.897	0.870	0.783		
3	0.760	0.913	0.798	0.823	0.746	0.759	0.768		
4	0.845	0.895	0.875	0.848	0.788	0.799	0.852		
5	0.880	0.811	0.861	0.869	0.798	0.846	0.840		
6	0.816	0.813	0.869	0.924	0.824	0.785	0.870		
7	0.801	0.834	0.763	0.838	0.895	0.885	0.863		
								Tscr.	AVG.
								.628	0.846

Location ID	13D			Bay	13	Elev.	11' 3"	Calibration Check: 11:16	
	A	B	C	D	E	F	G		
1	1.114	1.117	1.132	1.083	1.068	1.106	1.119		
2	0.950	1.041	0.999	1.061	1.007	1.117	1.100		
3	0.986	0.950	0.837	0.833	0.949	1.088	1.085		
4	1.005	0.977	0.878	0.851	0.911	0.958	0.997		
5	0.960	0.907	0.874	0.874	0.915	0.916	0.905		
6	0.944	0.947	0.897	0.887	0.920	0.865	0.892		
7	0.996	0.939	0.929	0.958	0.944	0.832	0.821		
								Tscr.	AVG.
								.628	0.968

Location ID	16D			Bay	16	Elev.	11' 3"	Calibration Check: 11:30	
	A	B	C	D	E	F	G		
1	1.133	1.133	1.133	1.141	1.145	1.145	1.144		
2	1.094	1.109	1.087	1.142	1.129	1.119	1.131		
3	1.040	1.026	1.043	1.081	1.095	1.085	1.096		
4	0.978	0.948	0.975	1.029	1.030	1.096	1.068		
5	0.976	0.969	0.977	1.069	1.013	1.067	1.041		
6	0.930	0.979	1.031	1.037	1.017	1.059	1.051		
7	0.922	0.972	0.996	1.031	1.005	1.033	1.052		
								Tscr.	AVG.
								.628	1.054

Location ID	17A			Bay	17	Elev.	11' 3"	Calibration Check: 11:43	
	A	B	C	D	E	F	G		
1	1.110	1.149	1.154	1.138	1.130	1.170	1.169		
2	1.121	1.159	1.114	1.144	1.134	1.148	1.123		
3	1.068	1.073	1.111	1.114	1.094	1.083	1.053		
4	0.976	0.991	0.980	1.030	1.046	0.994	0.950		
5	0.962	0.926	0.909	0.950	0.869	0.938	0.967		
6	0.903	0.956	0.891	0.835	0.802	0.950	0.963		
7	0.954	0.972	0.877	0.890	0.875	0.891	0.945		
								Tscr.	AVG.
								.628	1.015

7/21/10-20-06

Examined by <u>Matt Wilson</u>	Level <u>II</u>	Date <u>10/18/2008</u>
Examined by <u>Leslie Richter</u>	Level <u>II</u>	Date <u>10/18/2008</u>
Reviewed by: <u>Lee Stone</u>	Level <u>II</u>	Date <u>10/18/2008</u>

General Electric	<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek		Date:	10/18/2006
Refueling Outage - 1R21		UT Procedure:	ER-AA-335-004
Page 3 of 5		Specification:	IS-328227-004

Location ID	17D			Bay	17	Elev.	11' 3"	Calibration Check: 11:59	
	A	B	C	D	E	F	G		
1	0.849	0.828	0.861	0.894	0.930	0.888	0.702	<b>COMMENTS:</b> Core Plug located at A03, A04 and B03, B04. <i>Excluded</i>	
2	0.806	0.802	0.717	0.806	0.736	0.758	0.648		
3	<del>0.998</del>	<del>0.823</del>	0.752	0.733	<del>0.822</del>	0.730	<del>0.667</del>		
4	<del>1.072</del>	<del>1.073</del>	0.742	0.812	0.812	0.803	0.791		
5	0.814	0.841	0.850	0.816	0.852	0.856	0.869		
6	0.792	0.829	0.888	0.846	0.888	0.855	0.800		
7	0.824	0.897	0.837	0.887	0.891	0.935	0.886		
								Tscr. .628	AVG. 0.833

Location ID	17/19			Bay	17	Elev.	11' 3"	Calibration Check: 12:12	
	A	B	C	D	E	F	G		
1	0.969	0.962	0.945	0.931	0.965	0.960	0.928	553792-02 psc 3 AH3	
2	0.972	0.977	0.959	0.991	0.967	0.955	0.937		
3	0.968	0.974	1.004	0.987	0.982	0.996	0.924		
4	1.022	0.959	0.963	0.974	0.993	0.985	0.952		
5	0.960	0.962	0.951	0.950	0.943	0.982	0.901		
6	1.001	0.994	0.952	0.929	0.917	0.962	1.001		
7	0.995	1.019	1.012	0.995	1.009	0.946	1.000		
								Tscr. .628	AVG. 0.969

Location ID	19A			Bay	19	Elev.	11' 3"	Calibration Check: 12:26	
	A	B	C	D	E	F	G		
1	<del>0.692</del>	0.788	0.743	0.648	<del>0.699</del>	0.702	0.735	<b>COMMENTS:</b> Core Plug located at D04, D05, and C04, C05. <i>Excluded</i>	
2	0.807	0.774	0.845	0.736	0.747	0.724	0.773		
3	0.813	0.812	<del>0.892</del>	<del>0.885</del>	0.861	0.792	0.806		
4	0.916	0.883	<del>0.805</del>	<del>1.179</del>	0.808	0.777	0.766		
5	0.873	0.904	<del>0.842</del>	<del>1.150</del>	0.801	0.752	0.878		
6	0.844	0.768	0.834	0.858	0.851	0.834	0.867		
7	0.865	0.803	0.793	0.844	0.878	0.817	0.808		
								Tscr. .628	AVG. 0.822

Location ID	19B			Bay	19	Elev.	11' 3"	Calibration Check: 12:39	
	A	B	C	D	E	F	G		
1	0.865	0.862	0.872	0.932	0.947	0.992	0.802		
2	0.842	0.883	0.780	0.840	0.915	0.778	0.866		
3	0.861	0.906	0.838	0.898	0.974	0.930	0.834		
4	0.869	0.883	0.807	0.801	0.766	0.834	0.774		
5	0.811	0.770	0.785	0.788	0.799	0.731	0.778		
6	0.828	0.787	0.885	0.891	0.934	0.834	0.738		
7	0.872	0.822	0.904	0.828	0.843	0.875	0.871		
								Tscr. .628	AVG. 0.847

Location ID	19C			Bay	19	Elev.	11' 3"	Calibration Check: 12:53	
	A	B	C	D	E	F	G		
1	0.809	0.768	0.862	1.059	0.968	0.961	0.920	<b>COMMENTS:</b> Core Plug located at F03, F04, G03, G04. F03 obstructed due to surface condition. A01-A07 taken on Vertical Weld.	
2	<del>0.679</del>	0.745	0.695	0.814	<del>0.765</del>	<del>0.865</del>	0.845		
3	0.816	0.775	0.870	0.871	0.863	<del>0.863</del>	0.896		
4	0.791	<del>0.660</del>	0.715	0.793	1.151	<del>1.164</del>	0.918		
5	0.851	0.781	0.733	0.762	<del>0.862</del>	<del>0.787</del>	0.796		
6	0.866	0.830	0.880	0.757	0.867	0.760	0.753		
7	0.801	0.794	0.852	0.841	0.901	0.906	0.840		
								Tscr. .628	AVG. 0.839

Examined by Matt Wilson *Matt Wilson* Level II Date 10/18/2006  
 Examined by Leslie Richter *Leslie Richter* Level II Date 10/18/2006  
 Reviewed by: Lee Stone *Lee Stone* Level II Date 10/18/2006

*MM 10-20-06*

General Electric	<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek		Date:	10/18/2006
Refueling Outage - 1R21		UT Procedure:	ER-AA-335-004
Page 4 of 5		Specification:	IS-328227-004

Location ID	1D			Bay	1	Elev.	11' 3"	Calibration Check: 13:05
	A	B	C	D	E	F	G	
1	0.881	1.156	1.104	1.124	1.134	1.093	1.122	

Tscr.	AVG.
.628	1.088

*excluded*

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 page 4  
 AHJ

Location ID	3D			Bay	3	Elev.	11' 3"	Calibration Check: 13:14
	A	B	C	D	E	F	G	
1	1.199	1.189	1.187	1.173	1.156	1.187	1.166	

Tscr.	AVG.
.628	1.180

Location ID	5D			Bay		Elev.	11' 3"	Calibration Check: 13:23
	A	B	C	D	E	F	G	
1	1.174	1.191	1.186	1.187	1.187	1.184	1.184	

Tscr.	AVG.
.628	1.185

Location ID	7D			Bay	7	Elev.	11' 3"	Calibration Check: 13:31
	A	B	C	D	E	F	G	
1	1.144	1.147	1.147	1.138	1.102	1.135	1.116	

Tscr.	AVG.
.628	1.133

Location ID	9A			Bay	9	Elev.	11' 3"	Calibration Check: 13:40
	A	B	C	D	E	F	G	
1	1.158	1.159	1.162	1.159	1.159	1.153	1.130	

Tscr.	AVG.
.628	1.154

Examined by Matt Wilson  
 Examined by Leslie Richter  
 Reviewed by: Lee Stone

*Matt Wilson*  
*Leslie Richter*  
*Lee Stone*

Level II Date 10/18/2006  
 Level II Date 10/18/2006  
 Level II Date 10/18/2006

*MM 10-20-06*

General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek			Date:	10/18/2006
Refueling Outage -	1R21		UT Procedure:	ER-AA-335-004
Page 5 of	5		Specification:	IS-328227-004

Location ID	13C			Bay	13	Elev.	11' 3"	Calibration Check: 13:48
	A	B	C	D	E	F	G	
1	1.146	1.148	1.148	1.149	1.144	1.128	1.134	
							Tscr.	AVG.
							.628	1.142

Location ID	15A			Bay	15	Elev.		Calibration Check: 14:00
	A	B	C	D	E	F	G	
1	1.180	1.129	1.136	1.129	1.146	1.077	1.049	
							Tscr.	AVG.
							.628	1.121

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 page 5  
 A#)

Examined by Matt Wilson *Matt Wilson* Level II Date 10/18/2006  
 Examined by Leslie Richter *Leslie Richter* Level II Date 10/18/2006  
 Reviewed by: Lee Stone *Lee Stone* Level II Date 10/18/2006

*MW 10-20-06*

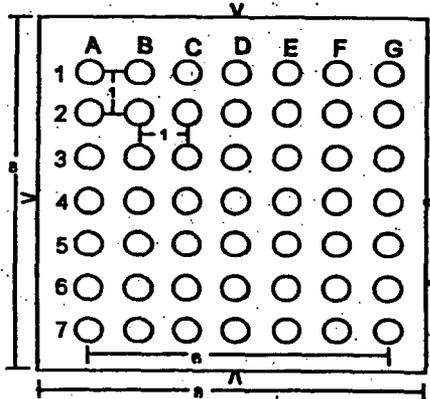
1R21LR-02B Pg 1 of 1

General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek			Date:	10/23/2006
Refueling Outage -	1R21		UT Procedure:	ER-AA-335-004
Page 1 of	1		Specification:	IS-328227-004

Examiner:	Graham McNabb	Level:	II	Instrument Type:	Panametrics 37DL Plus				
Examiner:	N/A	Level:	N/A	Instrument No:	031124309				
Transducer Type:	DV 506	Serial #:	012202	Size:	0.438"	Freq:	5 Mhz	Angle:	0°
Transducer Cable Type:	Panametrics	Length:	5'	Couplant:	Soundsafe	Batch No:	19620		
Calibration Block Type:	C/S Step Wedge	Block Number:	CAL-STEP-139						

SYSTEM CALIBRATION								
INSTRUMENT SETTINGS		Initial Cal. Time	Calibration Checks			Final Cal. Time		
Coarse Range:	5.0"	1:00	See Data	See Data	2:20			
Coarse Delay:	N/A	Calibrated Sweep Range = 0.500" Inches to 1.000" Inches						
Delay Calib:	N/A	Thermometer:	246672	Comp. Temp:	86°	Block Temp:	72°	
Range Calib:	N/A	W/O Number:	R2091258					
Instrument Freq.	N/A	Total Crew Dose	Drywell Containment Vessel Thickness Examination, Internal UT inspections.					
Gain:	55 db	48.0 mr						
Damping:	N/A							
Reject:	N/A							
Filter:	N/A							

Template aligned to V Stamps.  
Thickness readings taken at holes located in template.



Location ID	86-20			Bay	9	Elev.	87' 5"	Calibration Check: 14:30	
	A	B	C	D	E	F	G	Tscr.	AVG.
1	0.621	0.625	0.628	0.606	0.620	0.606	0.633		
2	0.611	0.619	0.623	0.607	0.634	0.599	0.641		
3	0.605	0.603	0.588	0.623	0.630	0.621	0.622		
4	0.614	0.604	0.615	0.586	0.620	0.630	0.623		
5	0.623	0.599	0.640	0.639	0.617	0.632	0.602		
6	0.602	0.631	0.611	0.624	0.619	0.628	0.638	0.545	0.617
7	0.593	0.596	0.596	0.585	0.629	0.636	0.620		

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page 6  
AH 3

COMMENTS: Upper Elevation Inspection Location 9/20 (86-20)

*Handwritten signature* 10-24-06

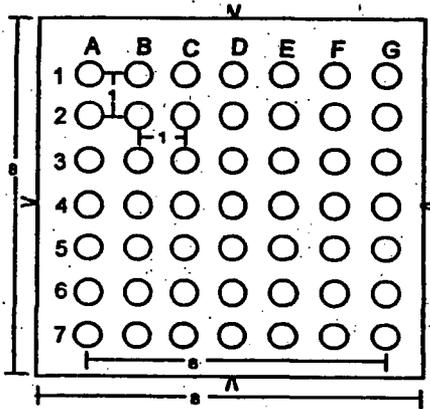
General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	NA
Oyster Creek			Date:	10/23/2006
Refueling Outage -	1R21		UT Procedure:	ER-AA-335-004
Page 1 of	2		Specification:	IS-328227-004

Examiner: Leslie Richter	Level: II	Instrument Type: Panametrics 37DL Plus
Examiner: Matt Wilson	Level: II	Instrument No: 031120708
Transducer Type: DV 506	Serial #: 012202	Size: 0.438" Freq: 5 Mhz Angle: 0°
Transducer Cable Type: Panametrics	Length: 5'	Couplant: Soundsafe Batch No: 19620
Calibration Block Type: C/S Step Wedge	Block Number: CAL-STEP-123	

**SYSTEM CALIBRATION**

INSTRUMENT SETTINGS		Initial Cal. Time	Calibration Checks		Final Cal. Time
Coarse Range:	2.0"	14:12	See Data	See Data	15:19
Coarse Delay:	N/A	Calibrated Sweep Range = 0.300" Inches to 1.000" Inches			
Delay Calib:	N/A	Thermometer: 246497	Comp. Temp: 86°	Block Temp: 72°	
Range Calib:	N/A	W/O Number: R2091258			
Instrument Freq:	N/A	Total Crew Dose	<b>Drywell Containment Vessel Thickness Examination. Internal UT Inspections.</b>		
Gain:	62 db	61 mR			
Damping:	N/A				
Reject:	N/A				
Filter:	N/A				

Template aligned to V Stamps.  
Thickness readings taken at holes located in template.



Location ID	86-28 (13/28)			Bay	13	Elev.	87' 5"
	A	B	C	D	E	F	G
1	0.605	0.610	0.646	0.642	0.648	0.644	0.616
2	0.634	0.642	0.649	0.650	0.624	0.639	0.622
3	0.636	0.643	0.649	0.610	0.647	0.653	0.654
4	0.607	0.637	0.636	0.563	0.601	0.653	0.653
5	0.632	0.624	0.639	0.626	0.649	0.656	0.658
6	0.597	0.640	0.639	0.656	0.652	0.640	0.654
7	0.636	0.633	0.630	0.658	0.652	0.640	0.648

Calibration Check: 14:25	
Tscr.	AVG.
0.545	0.636

Location ID	86-31 (15/31)			Bay	15	Elev.	87' 5"
	A	B	C	D	E	F	G
1	0.631	0.644	0.628	0.638	0.607	0.621	0.636
2	0.655	0.642	0.640	0.631	0.647	0.638	0.634
3	0.634	0.652	0.643	0.632	0.645	0.618	0.636
4	0.643	0.653	0.600	0.628	0.615	0.628	0.633
5	0.655	0.642	0.659	0.618	0.630	0.563	0.633
6	0.645	0.627	0.622	0.605	0.623	0.606	0.618
7	0.653	0.646	0.613	0.640	0.622	0.620	0.642

Calibration Check: 14:31	
Tscr.	AVG.
0.545	0.631

553792-02  
 case 7  
 ATT

**COMMENTS:**  
Readings found below the minimum acceptance criteria, see page 2 (50 - 22).

*mm'alt* LIT  
10-24-06

General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek			Date:	10/18/2006
Refueling Outage -	1R21		UT Procedure:	ER-AA-335-004
Page 2 of	2		Grid Procedure:	IS-328227-004

Location ID	50-22			Bay	1	Elev.	60'	Calibration Check: 15:05	
	A	B	C	D	E	F	G		
1	0.685	0.711	0.679	0.682	0.681	0.668	0.707		
2	0.715	0.703	0.703	0.703	0.716	0.722	0.658		
3	0.725	0.696	0.706	0.723	0.720	0.709	0.723		
4	0.697	0.661	0.675	0.720	0.726	0.712	0.623		
5	0.672	0.646	0.689	0.687	0.690	0.668	0.695		
6	0.665	0.652	0.675	0.700	0.667	0.636	0.650	Tscr.	AVG.
7	0.681	0.739	0.725	0.699	0.676	0.559	0.729	.625	0.689

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 page 8  
 AH 3

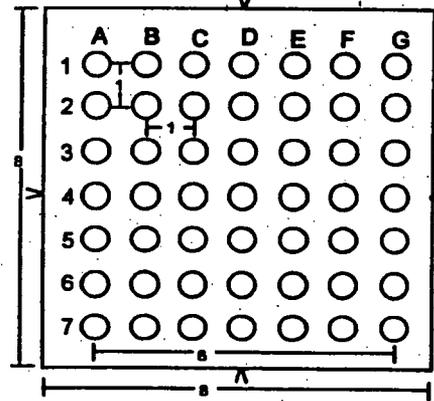
*William L III*  
10-24-06

Examined by <u>Leslie Richter</u>	<u>Level II</u>	Date <u>10/23/2006</u>
Examined by <u>Matt Wilson</u>	<u>Level II</u>	Date <u>10/23/2006</u>
Reviewed by: <u>Lee Stone</u>	<u>Level II</u>	Date <u>10/23/2006</u>

General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A					
Oyster Creek			Date:	10/18/2006					
Refueling Outage -	1R21		UT Procedure:	ER-AA-335-004					
Page 1 of	2		Specification:	IS-328227-004					
Examiner:	Lee Stone <i>du</i>	Level:	II	Instrument Type:	Panametrics 37DL Plus				
Examiner:	N/A	Level:	N/A	Instrument No:	031125009				
Transducer Type:	DV 506	Serial #:	072362	Size:	0.438"	Freq:	5 Mhz	Angle:	0°
Transducer Cable Type:	Panametrics	Length:	5'	Couplant:	Soundsafe	Batch No:	19620		
Calibration Block Type:	C/S Step Wedge	Block Number:	CAL-STEP-123						

**SYSTEM CALIBRATION**

INSTRUMENT SETTINGS		Initial Cal. Time	Calibration Checks		Final Cal. Time		
Coarse Range:	2.0"	14:30	See Data	See Data	17:50		
Coarse Delay:	N/A	Calibrated Sweep Range = 0.300"		Inches to 1.500" Inches			
Delay Calib:	N/A	Thermometer:	246534	Comp. Temp:	72°	Block Temp:	79°
Range Calib:	N/A	W/O Number:	R2091258				
Instrument Freq.	N/A	Total Crew Dose	<b>Drywell Containment Vessel Thickness Examination. Internal UT Inspections.</b>				
Gain:	58 db	20.2 mR					
Damping:	N/A	<div data-bbox="515 743 984 907" data-label="Text" style="border: 1px solid black; padding: 5px; margin: 10px auto; width: fit-content;">                     Template aligned to V Stamps.                       Thickness readings taken at holes located in template.                 </div>					
Reject:	N/A						
Filter:	N/A						



Location ID	51-5			Bay	5	Elev.	50' 2"
	A	B	C	D	E	F	G
1	0.739	0.655	0.734	0.765	0.768	0.769	0.716
2	0.762	0.747	0.758	0.748	0.774	0.772	0.716
3	0.769	0.755	0.650	0.678	0.756	0.759	0.758
4	0.739	0.761	0.690	0.660	0.704	0.768	0.772
5	0.693	0.755	0.707	0.767	0.750	0.770	0.750
6	0.758	0.751	0.725	0.715	0.729	0.767	0.724
7	0.758	0.763	0.764	0.732	0.772	0.761	0.766

Calibration Check: 14:30	
Tscr.	AVG.
0.620	0.741

Location ID	51-D1			Bay	5	Elev.	50' 2"
	A	B	C	D	E	F	G
1	0.753	0.726	0.762	0.737	0.749	0.760	0.746
2	0.745	0.683	0.750	0.739	0.755	0.718	0.737
3	0.756	0.754	0.755	0.743	0.742	0.743	0.745
4	0.754	0.741	0.737	0.692	1.160	OBST.	0.739
5	0.757	0.758	0.756	0.745	0.734	1.160	0.736
6	0.767	0.748	0.743	0.732	0.730	0.739	0.726
7	0.748	0.747	0.748	0.751	0.742	0.745	0.749

<b>COMMENTS:</b>	
F4 obstructed by Core Plug hole. E4 and F5 readings taken on Core Plug.	
Calibration Check: 14:54	
Tscr.	AVG.
0.620	0.760

COMMENTS: File Specific Comments located to right of readings.

5-53792-07  
 P. 5: 9  
 AHJ

*Examined by: M. Mathis 10-20-06*

General Electric	<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	N/A
Oyster Creek		Date:	10/18/2006
Refueling Outage - 1R21		UT Procedure:	ER-AA-335-004
Page 2 of 2		Grid Procedure:	IS-328227-004

Location ID	51-13			Bay	13	Elev.	50' 2"	Calibration Check: 15:32	
	A	B	C	D	E	F	G		
1	0.702	0.649	0.771	0.751	0.765	0.774	0.777		
2	0.697	0.627	0.768	0.753	0.741	0.763	0.772		
3	0.649	0.667	0.766	0.730	0.743	0.768	0.765		
4	0.699	0.701	0.758	0.699	0.771	0.768	0.769		
5	0.629	0.758	0.689	0.763	0.768	0.772	0.763		
6	0.730	0.720	0.687	0.776	0.766	0.762	0.771	Tscr.	AVG.
7	0.772	0.771	0.739	0.774	0.764	0.733	0.769	.620	0.740

Location ID	52-13			Bay	13	Elev.	51' 10"	Calibration Check: 15:52	
	A	B	C	D	E	F	G		
1	0.713	0.712	0.716	0.712	0.698	0.709	0.705		
2	0.712	0.711	0.691	0.696	0.714	0.670	0.702		
3	0.717	0.667	0.713	0.684	0.712	0.623	0.672		
4	0.719	0.613	0.714	0.617	0.713	0.712	0.562		
5	0.717	0.700	0.718	0.716	0.717	0.716	0.679		
6	0.711	0.712	0.720	0.719	0.716	0.719	0.681	Tscr.	AVG.
7	0.718	0.713	0.720	0.720	0.717	0.717	0.713	.675	0.699

Location ID	51-16			Bay	15	Elev.	50' 2"	Calibration Check: 16:16	
	A	B	C	D	E	F	G		
1	0.735	0.740	0.750	0.758	0.765	0.761	0.762		
2	0.767	0.742	0.756	0.764	0.738	0.718	0.750		
3	0.732	0.760	0.729	0.764	0.742	0.740	0.757		
4	0.769	0.758	0.754	0.745	0.638	0.763	0.764		
5	0.753	0.736	0.769	0.759	0.672	0.745	0.741		
6	0.765	0.768	0.727	0.762	0.717	0.702	0.769	Tscr.	AVG.
7	0.758	0.766	0.734	0.767	0.702	0.737	0.760	.620	0.745

553792-02  
 page 10  
 AH )

10-20-06

Examined by <u>Lee Stone</u> <i>du S</i>	Level <u>II</u>	Date <u>10/18/2006</u>
Examined by <u>N/A</u>	Level <u>N/A</u>	Date <u>N/A</u>
Reviewed by: <u>Kimberly Wert</u> <i>Kimberly Wert</i>	Level <u>II</u>	Date <u>10/18/2006</u>

Bay 9 Area 20  
Subject: Drywell Corrosion

Calc. No. C-1301-187-E310-037

Rev. No. 1

System No. 187

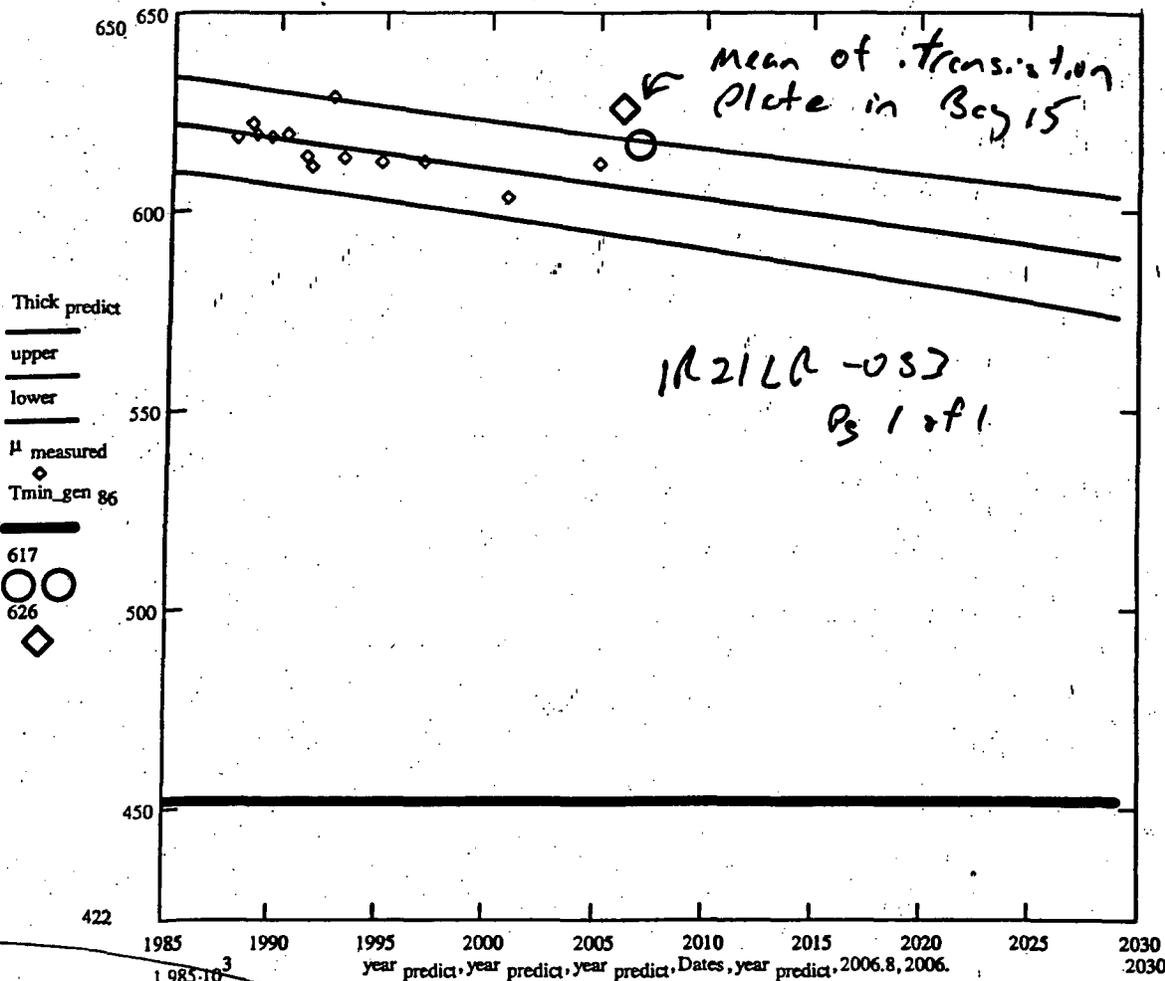
Sheet No. A7-23 of 23

The minimum required thickness at this elevation is  $T_{min\_gen\ 86_f} := 452$  (Ref. Calc. SE-000243-002)

624  
452  
---  
172

Location Curve Fit Projected to Plant End Of Life

$m_s = -0.754$



553792-02  
Page 11  
Att 3

$year\ predict_{12} = 2.009 \cdot 10^3$

$Thick\ predict_{12} = 604.115$

Therefore the regression model shows that even at the lower 95% confidence band this location will not corrode to below Drywell Vessel Minimum required thickness by the plant end of life.

No Pits have been identified for this location

449  
2

IR21LR-033 Pg 1 of 1

General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:		
Oyster Creek			Date: 10/26/2006		
Refueling Outage - 1R21			UT Procedure: ER-AA-335-004		
Page 1 of 1			Specification: IS-328227-004		
Examiner: Jeremy Tuttle <i>Jeremy Tuttle</i>		Level: II	Instrument Type: Panametrics 37DL Plus		
Examiner: N/A		Level: N/A	Instrument No: 031124309		
Transducer Type: D7908		Serial #: 338302	Size: 0.200"	Freq: 7.5 Mhz	Angle: 0°
Transducer Cable Type: Panametrics		Length: 5'	Couplant: Soundsafe	Batch No: 19620	
Calibration Block Type: C/S Step Wedge		Block Number: CAL-STEP-123			

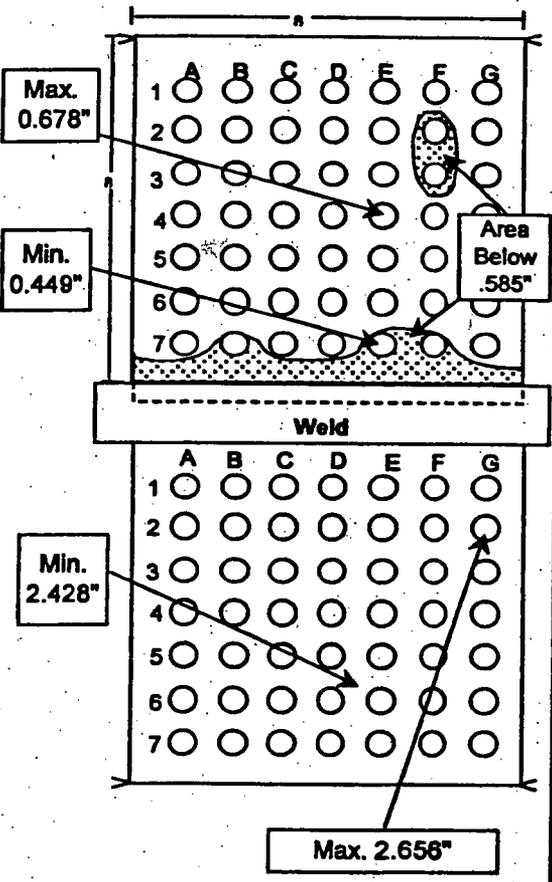
SYSTEM CALIBRATION					
INSTRUMENT SETTINGS		Initial Cal. Time	Calibration Checks		Final Cal. Time
Coarse Range:	2.0" - 5.0"	3:10	See Data	See Data	4:25
Coarse Delay:	N/A	Calibrated Sweep Range = 0.500"		Inches to 4.000"	Inches
Delay Calib:	N/A	Thermometer: 246518	Comp. Temp: 62°	Block Temp: 64°	
Range Calib:	N/A	W/O Number: R2091258			
Instrument Freq:	N/A	Total Crew Dose	Drywell Containment Vessel Thickness Examination.		
Gain:	60-65 db	40.0 mr	Internal UT Inspections.		
Damping:	N/A	71' 6" Weld Scan			
Reject:	N/A				
Filter:	N/A				

Location ID	71-15 weldup			Bay	15	Elev.	71' 6"
	A	B	C	D	E	F	G
1	0.634	0.667	0.660	0.667	0.637	0.578	0.590
2	0.638	0.612	0.620	0.638	0.616	0.538	0.627
3	0.625	0.660	0.609	0.664	0.624	0.514	0.631
4	0.615	0.659	0.649	0.643	0.678	0.661	0.659
5	0.638	0.637	0.647	0.665	0.665	0.665	0.672
6	0.612	0.639	0.645	0.628	0.593	0.633	0.628
7	0.662	0.549	0.618	0.604	0.449	0.547	0.611

Calibration Check: 03:36	
Tscr.	0.685
Avg.	0.624

Location ID	71-15 welddn			Bay	15	Elev.	71' 6"
	A	B	C	D	E	F	G
1	2.527	2.575	2.518	2.499	2.560	2.620	2.648
2	2.536	2.529	2.471	2.597	2.565	2.633	2.656
3	2.534	2.513	2.485	2.485	2.466	2.562	2.527
4	2.509	2.451	2.492	2.514	2.490	2.549	2.528
5	2.549	2.508	2.536	2.518	2.481	2.530	2.526
6	2.512	2.513	2.547	2.511	2.548	2.523	2.489
7	2.601	2.530	2.536	2.533	2.515	2.455	2.483

Calibration Check: 03:50	
Tscr.	2.550
Avg.	2.530



PCJL 553752-07  
A11

**COMMENTS:**  
 Forty nine (49) readings were taken using the 8"x 8" template to determine the average reading.  
 A 100% scan within the 8"x 8" area to determine the minimum and the maximum thickness.  
 A scan of the uppermost 1" of horizontal weld was performed, the minimum reading on the weld was 0.700" the maximum reading on the weld was 0.893". Unable to obtain readings on the lower part of weld due to rough and non-parallel surfaces.  
 Inspection area centered 13" right of vertical seam weld between plate 71-1 and plate 71-2, looking outward. Reference drawing 2E-187-29-001 R0.

*Maxwell L III* 10-27-06

Reviewed by: Lee Stone <i>du</i>	Level: II	Date: 10/26/2006
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General Electric	<b>Ultrasonic Thickness Measurement Data Sheet</b>	File Name:	
Oyster Creek		Date:	10/26/2006
Refueling Outage - 1R21		UT Procedure:	ER-AA-335-004
Page 1 of 1		Specification:	IS-328227-004

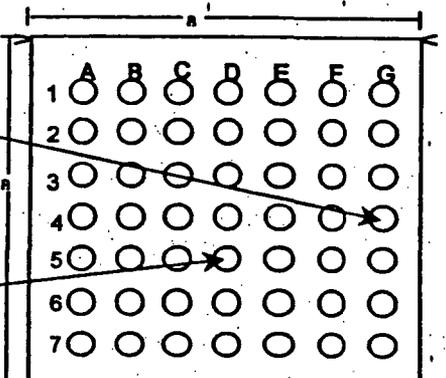
Examiner: Jeremy Tuttle <i>Jeremy Tuttle</i>	Level: II	Instrument Type: Panametrics 37DL Plus
Examiner: N/A	Level: N/A	Instrument No: 031124309
Transducer Type: D7908	Serial #: 338302	Size: 0.200" Freq: 7.5 Mhz Angle: 0°
Transducer Cable Type: Panametrics Length: 5'	Couplant: Soundsafe	Batch No: 19620
Calibration Block Type: C/S Step Wedge	Block Number: CAL-STEP-123	

SYSTEM CALIBRATION			
INSTRUMENT SETTINGS	Initial Cal. Time	Calibration Checks	Final Cal. Time
Coarse Range: 2.0" - 5.0"	5:01	See data See data	5:48
Coarse Delay: N/A	Calibrated Sweep Range = 0.500" Inches to 4.000" Inches		
Delay Calib: N/A	Thermometer: 246518	Comp. Temp: 62°	Block Temp: 64°
Range Calib: N/A	W/O Number: R2091258		
Instrument Freq: N/A	Total Crew Dose: 40.0 mR	Drywell Containment Vessel Thickness Examination. Internal UT Inspections.	
Gain: 60-65 db	71' 6" Weld Scan		
Damping: N/A			
Reject: N/A			
Filter: N/A			

Location ID	71-19 weldup			Bay	19	Elev.	71' 6"
	A	B	C	D	E	F	G
1	0.624	0.621	0.632	0.638	0.601	0.621	0.639
2	0.641	0.645	0.620	0.635	0.591	0.628	0.613
3	0.633	0.634	0.635	0.631	0.643	0.606	0.641
4	0.617	0.639	0.644	0.617	0.605	0.629	0.554
5	0.635	0.644	0.645	0.656	0.653	0.628	0.690
6	0.644	0.612	0.629	0.642	0.626	0.598	0.622
7	0.648	0.622	0.610	0.624	0.612	0.636	0.603

Min. 0.554"

Max. 0.656"



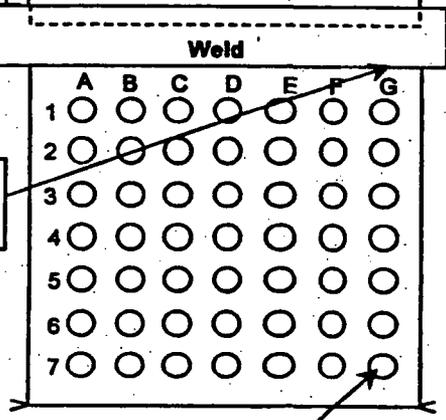
Page 12 553792-02  
RH 3

Calibration Check: 05:27	
Tscr.	0.588
Avg.	0.626

Location ID	71-19 welddn			Bay	19	Elev.	71' 6"
	A	B	C	D	E	F	G
1	2.634	2.644	2.658	2.655	2.639	2.642	2.659
2	2.644	2.646	2.637	2.670	2.654	2.651	2.654
3	2.636	2.622	2.643	2.659	2.642	2.628	2.660
4	2.634	2.636	2.630	2.648	2.662	2.646	2.628
5	2.629	2.639	2.649	2.658	2.657	2.651	2.696
6	2.660	2.633	2.642	2.644	2.654	2.642	2.686
7	2.640	2.650	2.664	2.639	2.650	2.657	2.671

Min. 2.599"

Max. 2.671"



Calibration Check: 05:25	
Tscr.	2.550
Avg.	2.648

**COMMENTS:**

Forty nine (49) readings were taken using the 8"x 8" template to determine the average reading. A 100% scan within the 8"x 8" area to determine the minimum and the maximum thickness. A scan of the uppermost 1" of horizontal weld was performed, the minimum reading on the weld was 0.717" the maximum reading on the weld was 0.911". Unable to obtain readings on the lower part of weld due to rough and non-parallel surfaces. Inspection area centered 4" left of vertical seam weld between plate 71-2 and plate 71-3, looking outward. Reference Drawing 2E-187-29-001 R0.

*M.M. Abil L III 10-27-06*

Bay 15 Area 23  
 Subject:  
 Drywell Corrosion

Calc. No.  
 C-1301-187-E310-037

Rev. No.  
 1

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 187

Sheet No.  
 A4- 27 of 32

For the overall mean

$$\text{upper}_f := \text{Thick}_{\text{predict}_f} +$$

$$+ qt \left( 1 - \frac{\alpha_t}{2}, \text{Total means} - 2 \right) \cdot \text{Standard error} \cdot \sqrt{1 + \frac{1}{(d+1)} + \frac{(\text{year}_{\text{predict}_f} - \text{Thick}_{\text{actualmean}})^2}{\text{sum}}}$$

$$\text{lower}_f := \text{Thick}_{\text{predict}_f} -$$

$$- \left[ qt \left( 1 - \frac{\alpha_t}{2}, \text{Total means} - 2 \right) \cdot \text{Standard error} \cdot \sqrt{1 + \frac{1}{(d+1)} + \frac{(\text{year}_{\text{predict}_f} - \text{Thick}_{\text{actualmean}})^2}{\text{sum}}} \right]$$

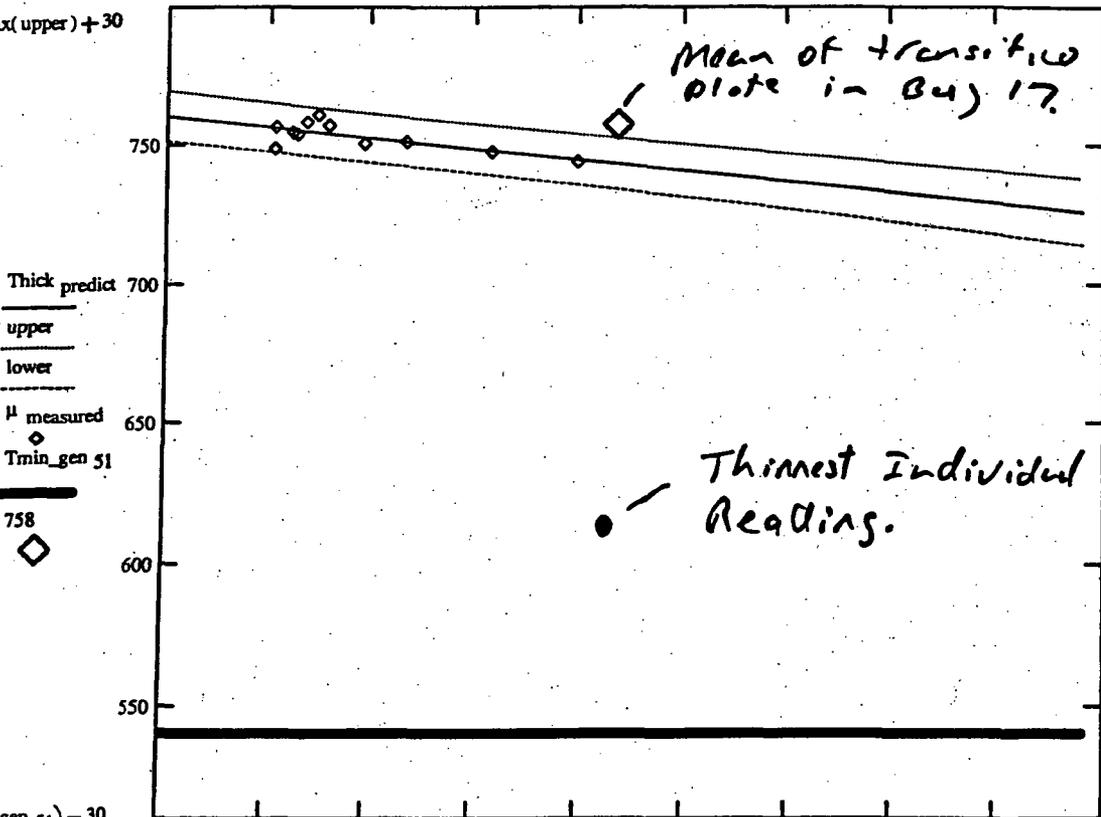
General area Tmin for this elevation in the Drywell

$$\text{Tmin}_{\text{gen } 51_f} := 541 \quad (\text{Ref. Calc. SE-000243-002})$$

*IR 212R-029 Ps 1 of 1*

$$m_s = -0.777$$

max(upper) + 30



*553752  
 -07  
 case 14  
 A-H 3*

min(Tmin\_gen 51) - 30

1985 1990 1995 2000 2005 2010 2015 2020 2025 2030  
 year predict, year predict, year predict, Dates, year predict, 2006.8 2.029 · 10<sup>3</sup>

General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>		File Name:	N/A
Oyster Creek				Date:	10/23/2008
Refueling Outage -	1R21			UT Procedure:	ER-AA-335-004
Page 1 of	21			Specification:	IS-328227-004
Examiner:	Jeremy Tuttle	Level:	II	Instrument Type:	Panametrics 37DL Plus
Examiner:	N/A	Level:	N/A	Instrument No:	031120708
Transducer Type:	D7908	Serial #:	338302	Size:	0.200"
		Size:	0.200"	Freq:	7.5 Mhz
		Angle:	0°		
Transducer Cable Type:	Panametrics	Length:	5'	Couplant:	Soundsafe
		Batch No:	19620		
Calibration Block Type:	C/S Step Wedge	Block Number:	CAL-STEP-108		

**SYSTEM CALIBRATION**

INSTRUMENT SETTINGS		Initial Cal. Time	Calibration Checks		Final Cal. Time
Coarse Range:	2.0" - 5.0"	22:10	See Data	See Data	23:24
Coarse Delay:	N/A	Calibrated Sweep Range = 0.500"		Inches to 1.500"	Inches
Delay Calib:	N/A	Thermometer:	246518	Comp. Temp:	52°
Range Calib:	N/A	W/O Number:	R2091258	Block Temp:	56°
Instrument Freq:	N/A	Total Crew Dose	Drywell Containment Vessel Thickness Examination. Internal UT inspections.		
Gain:	60-70 db	22.0 mR			
Damping:	N/A	23' 6" Weld Scan			
Reject:	N/A				
Filter:	N/A				

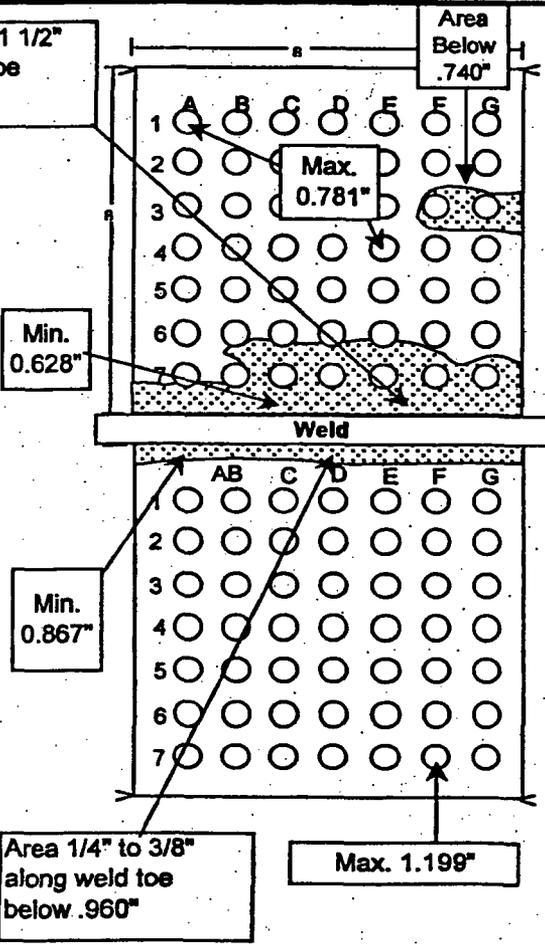
Location ID	23-17 weldup			Bay	17	Elev.	23' 6"
	A	B	C	D	E	F	G
1	0.781	0.773	0.770	0.760	0.767	0.760	0.770
2	0.765	0.769	0.765	0.762	0.761	0.758	0.760
3	0.761	0.759	0.774	0.777	0.765	0.716	0.707
4	0.776	0.758	0.773	0.764	0.781	0.777	0.760
5	0.763	0.764	0.775	0.774	0.776	0.771	0.762
6	0.771	0.763	0.761	0.774	0.772	0.762	0.758
7	0.763	0.745	0.652	0.742	0.683	0.745	0.673

Case 15 553792-02  
AH)

Calibration Check: 22:53	
Tscr.	0.740
Avg.	0.758

Location ID	23-17 weldn			Bay	17	Elev.	23' 6"
	A	B	C	D	E	F	G
1	1.157	1.169	1.141	1.154	1.168	1.162	1.147
2	1.176	1.170	1.161	1.152	1.156	1.171	1.160
3	1.175	1.183	1.170	1.166	1.165	1.162	1.176
4	1.172	1.189	1.188	1.188	1.190	1.171	1.151
5	1.190	1.195	1.185	1.192	1.192	1.195	1.189
6	1.195	1.176	1.188	1.190	1.184	1.193	1.180
7	1.177	1.175	1.180	1.181	1.183	1.199	1.192

Calibration Check: 22:48	
Tscr.	0.960
Avg.	1.176



**COMMENTS:**  
 Forty nine (49) readings were taken using the 8"x 8" template to determine the average reading. 100% scan of the weld and 100% scan within the 8"x 8" area to determine the minimum and the maximum thickness. Minimum reading on weld was 0.689", Maximum reading on weld was 0.918".

Inspection area centered 55" left of vertical seam weld between plate 23-19 and plate 23-20, looking outward. Reference drawing 2E-187-29-001 R0.

Reviewed by:	Lee Stone <i>du Stone</i>	Level:	II	Date:	10/23/2008
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30 Nov 10-25-06  
1R21R-029 B 1 of 1

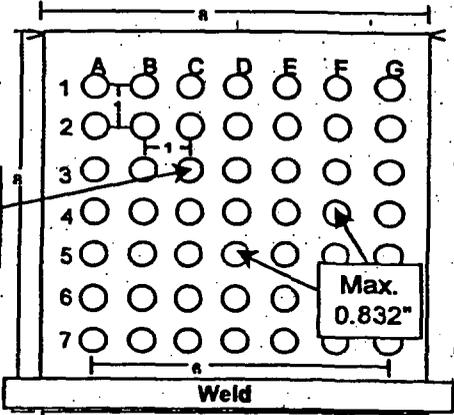
General Electric		<b>Ultrasonic Thickness Measurement Data Sheet</b>		File Name:	N/A
Oyster Creek				Date:	10/24/2006
Refueling Outage -	1R21			UT Procedure:	ER-AA-335-004
Page 1 of	21			Specification:	IS-328227-004
Examiner:	Jeremy Tuttle	Level:	II	Instrument Type:	Panametrics 37DL Plus
Examiner:	N/A	Level:	N/A	Instrument No.:	031120708
Transducer Type:	D7908	Serial #:	338302	Size:	0.200"
Transducer Cable Type:	Panametrics	Length:	5'	Freq:	7.5 Mhz
Calibration Block Type:	C/S Step Wedge	Block Number:	CAL-STEP-108	Angle:	0°
		Couplant:	Soundsafe	Batch No.:	19620

**SYSTEM CALIBRATION**

INSTRUMENT SETTINGS		Initial Cal. Time	Calibration Checks		Final Cal. Time
Coarse Range:	2.0" - 5.0"	2:28	See Data	See Data	3:27
Coarse Delay:	N/A	Calibrated Sweep Range = 0.500"		Inches to 1.500"	Inches
Delay Calib:	N/A	Thermometer:	246518	Comp. Temp.:	52°
Range Calib:	N/A	W/O Number:	R2091258	Block Temp.:	56°
Instrument Freq.:	N/A	Total Crew Dose	Drywell Containment Vessel Thickness Examination. Internal UT inspections.		
Gain:	60 db	9.0 mr			
Damping:	N/A	23' 6" Weld Scan			
Reject:	N/A				
Filter:	N/A				

Location ID	23-15 weldup			Bay	15	Elev.	23' 6"
	A	B	C	D	E	F	G
1	0.792	0.773	0.757	0.728	0.827	0.759	0.813
2	0.796	0.765	0.770	0.765	0.827	0.738	0.831
3	0.745	0.728	0.655	0.787	0.827	0.826	0.823
4	0.798	0.795	0.786	0.810	0.826	0.832	0.829
5	0.799	0.790	0.789	0.832	0.825	0.822	0.830
6	0.799	0.798	0.792	0.825	0.813	0.799	0.811
7	0.791	0.794	0.797	0.828	0.808	0.803	0.805

Min. 0.655"



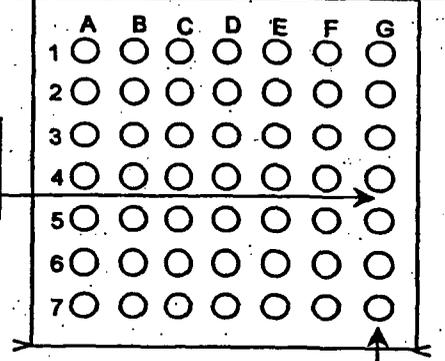
Max. 0.832"

PCSC 16011553797-02  
A H J

Calibration Check: 03:04	
Tscr.	0.740
Avg.	0.795

Location ID	23-15 welddn			Bay	15	Elev.	23' 6"
	A	B	C	D	E	F	G
1	1.154	1.153	1.149	1.154	1.156	1.187	1.147
2	1.156	1.160	1.165	1.154	1.150	1.165	1.161
3	1.154	1.160	1.158	1.154	1.157	1.153	1.171
4	1.157	1.161	1.149	1.160	1.149	1.158	1.165
5	1.167	1.155	1.145	1.170	1.157	1.160	1.150
6	1.175	1.157	1.158	1.167	1.157	1.156	1.164
7	1.175	1.177	1.177	1.168	1.154	1.167	1.186

Min. 1.141"



Max. 1.186"

Calibration Check: 03:08	
Tscr.	0.960
Avg.	1.160

**COMMENTS:**

Forty nine (49) readings were taken using the 8"x 8" template to determine the average reading. 100% scan of the weld and 100% scan within the 8"x 8" area to determine the minimum and the maximum thickness. Minimum reading on weld was 0.865", Maximum reading on weld was 1.029"

Inspection area centered 15" left of vertical seam weld between plate 23-18 and plate 23-19, looking outward. Reference drawing 2E-187-29-001 R0.

*Michael L. IT 10-25-06*

Reviewed by: Lee Stone	<i>Lee Stone</i>	Level	II	Date	10/24/2006
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