Entergy

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GNRO-2015/00058

September 1, 2015

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

SUBJECT: Response to License Renewal Application (LRA) Request for Additional Information (RAI) Set 47, Question 4.2.1-2c (5) (a) i
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

REFERENCES:

1. U.S. Nuclear Regulatory Commission Letter, "Requests for Additional Information for the Review of the Grand Gulf Nuclear Station, License Renewal Application," dated August 28, 2013 (Accession No. ML13227A394)

2. Grand Gulf Nuclear Station Letter GNRO-2013/00069, "Response to Requests for Additional Information (RAI) set 47," dated September 23, 2013 (Accession No. ML13266A368)

3. Grand Gulf Nuclear Station Letter GNRO-2014/00080, "Application to Revise Grand Gulf Nuclear Station Unit 1's Current Fluence Methodology from 0 EFPY Through the End of Extended Operations to a Single Fluence Method," dated November 21, 2014.

4. Grand Gulf Nuclear Station Letter GNRO-2015/00011, "Supplement to License Amendment Request to Revise Grand Gulf Nuclear Station Unit 1's Current Fluence Methodology from 0 EFPY Through the End of Extended Operations to a Single Fluence Method," dated February 18, 2015.

5. Grand Gulf Nuclear Station Letter GNRO-2015/00021, "Follow-up Response to U.S. Nuclear Regulatory Commission Letter, Updated Fluence Methodology License Amendment Request Unacceptable with Opportunity to Supplement," dated March 30, 2015.

6. Grand Gulf Nuclear Station Letter GNRO-2015/00033, dated May 14, 2015 "Docketed Letters Regarding Fluence Calculation Methodology Concerning License Renewal Amendment Request for Additional Information Set 47, Question 4.2.1-2c, in Entergy Letter GNRO-2013/00069 dated 9/23/13"

7. U.S. Nuclear Regulatory Commission Letter, "Grand Gulf Nuclear Station, Unit 1 – Issuance of Amendment, RE: Adoption of Single Fluence Methodology (TAC No. MF5303, ML15229A218)." Amendment No. 204 to NPF-29, dated August 18, 2015.

Dear Ms. Richardson:

In this letter, Entergy Operations, Inc. (Entergy) is submitting response to reference 2, License Renewal Application (LRA) Request for Additional Information (RAI) 4.2.1-2c (5) (a), which reads as follows:

5) As an alternative to Items 1-3 above, please provide:

a) Fluence values that have been determined from Beginning of Life to End of Life Extended in accordance with a single method.

i) If the method is NRC-approved insofar as it applies to vessel fluence calculations, provide the reference to the staff-accepted methodology.

ii) If the method is not NRC-approved, provide the plant-specific calculations and documentation, and include sufficient information to enable the NRC staff to determine whether the calculation adheres to NRC Regulatory Guide (RG) 1.190, "Calculational and Dosimetry Methods for Determining Pressure Vessel Neutron Fluence," or other justification as required to establish that the fluence calculation is acceptable.

iii) Refer to Regulatory Position 3, "Reporting," for the specific documentation required to establish adherence to NRC RG 1.190.

In order to provide fluence values that have been determined in accordance with a single method, Grand Gulf Nuclear Station (GGNS) submitted a License Amendment Request (LAR) to adopt the MP Machinery and Testing, LLC (MPM) Method of calculating reactor vessel neutron fluence, per the requirements of NRC RG 1.190, in letter GNRO-2014/00080, dated November 21, 2014. The MPM Method of calculating reactor vessel neutron fluence at GGNS was NRC approved on August 18, 2015 (Reference 7). Amendment number 204 to License number NPF-29 was issued 8/18/15 and documented in ADAMS Accession No.ML15229A218.

Because the Fluence Calculation Methodology is NRC-approved, Entergy is responding with this letter to RAI 4.2.1-2c (5) (a) (i) and providing the reference to the staff-accepted methodology (i.e. MPM method) as documented in Reference 7. Attachment 1 provides the Shroud/Top Guide weld fluence results at the end of cycles 21 (28.088 Effective Full Power Years {EFPY} Exposure), after 35 EFPY exposure, and after 54 EFPY exposure. The fluence values are a result of the plant-specific calculations which adhere to NRC RG 1.190.

Please note that the quoted value for exposure at End of Cycle (EOC) 21 of 28.088 EFPY is a 'predicted' value. The last reload evaluation tabulated a 'predicted' fluence exposure for the vessel of 26.85 EFPY at EOC20, and the MPM method predicted exposure of 28.088 EFPY is therefore very reasonable. At EOC20, per the normal fuel analysis process, GGNS will update and make a new prediction for EOC21 based on the actual power history for Cycle 20.

This letter contains no new commitments. If you have any questions or require additional information, please contact Mr. James Nadeau at (601) 437-2103.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 1, 2015.

Sincerely,

KJM/ras

Attachments: 1. Fluence Values That Have Been Determined From Beginning of Life To End of Life Extended In Accordance With A Single Method

cc:

U.S. Nuclear Regulatory Commission
ATTN: Ms. Rebecca Richardson, Project Manager
Projects Branch 1, Division of License Renewal
Office of Nuclear Reactor Regulation, Mail Stop O-11 F1
Washington, DC 20555

U.S. Nuclear Regulatory Commission
ATTN: Mr. Mark Dapas, (w/2)
Regional Administrator, Region IV
1600 East Lamar Boulevard
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U. S. Nuclear Regulatory Commission
ATTN: Mr. Alan Wang, NRR/DORL (w/2)
Mail Stop OWFN 8 B1
Washington, DC 20555-0001

NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

Attachment 1 to

GNRO-2015/00058

Grand Gulf Nuclear Station

Fluence Values That Have Been Determined From Beginning of Life To End of Life Extended In Accordance With A Single Method

A
SHROUD/TOP GUIDE WELD FLUENCE RESULTS AT THE END OF CYCLE 21 (28.088 EFPY EXPOSURE)

This appendix contains calculated fast fluence values (fluence for neutrons with energy above 1 MeV) for welds in the shroud and top guide. Fluence values for each weld are given at the IR, OR, and at positions 1/4, 1/2, and 3/4 of the distance between the IR and OR for an operation time of 28.088 EFPY (the calculated end of cycle 21). Values are tabulated versus azimuthal angle for horizontal welds, and versus height above BAF for vertical welds.

Welds V7 and V8 in the top guide extend from 0 radius to the outside of the guide assembly. For these welds, fluence values are given as a function of radius for 5 axial heights.

As discussed in Section 4, scallops are cut in the outside of the shroud at angles of approximately 18, 33.5, 44.5, 59, 69, and 84.5 degrees. These scallops affect welds H5 and H6A and reduce the outside radius of the shroud at angles near these values. The extent of the region of removed material is between 1.5 and 2 degrees for weld H5 and between 2 and 3 degrees for weld H6A. Thus, the angles in the tabulated fluence data that are affected include 17.5, 32.5, 45, 60, 67.5, 70, and 85 degrees and, to a lesser extent, 35 degrees, for weld H5. For weld H6A, these same angles are affected with possibly some effect at neighboring angles. The depth of the scallops is sufficient that at weld H6A, material may be removed below the 3/4T position. The tables do not reflect any change in shroud OR and thus the fluence at the affected angles is tabulated for locations that are actually outside the shroud.

Appendix Table A- 1 Fast Fluence at Locations in the Top Guide for Weld H1 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	1.35E+19	1.22E+19	1.03E+19	8.21E+18	6.26E+18
2.5	1.35E+19	1.22E+19	1.03E+19	8.19E+18	6.25E+18
5	1.35E+19	1.22E+19	1.03E+19	8.20E+18	6.25E+18
7.5	1.35E+19	1.22E+19	1.03E+19	8.21E+18	6.26E+18
10	1.36E+19	1.23E+19	1.04E+19	8.27E+18	6.30E+18
12.5	1.37E+19	1.23E+19	1.04E+19	8.30E+18	6.32E+18
15	1.37E+19	1.24E+19	1.04E+19	8.33E+18	6.35E+18
17.5	1.38E+19	1.25E+19	1.05E+19	8.37E+18	6.38E+18
20	1.39E+19	1.26E+19	1.06E+19	8.44E+18	6.42E+18
22.5	1.40E+19	1.27E+19	1.06E+19	8.50E+18	6.48E+18
25	1.42E+19	1.28E+19	1.07E+19	8.56E+18	6.52E+18
27.5	1.43E+19	1.29E+19	1.08E+19	8.62E+18	6.56E+18
30	1.44E+19	1.30E+19	1.09E+19	8.69E+18	6.62E+18
32.5	1.46E+19	1.31E+19	1.10E+19	8.76E+18	6.66E+18
35	1.46E+19	1.32E+19	1.10E+19	8.81E+18	6.70E+18
37.5	1.47E+19	1.32E+19	1.11E+19	8.85E+18	6.74E+18
40	1.48E+19	1.33E+19	1.12E+19	8.90E+18	6.77E+18
42.5	1.48E+19	1.33E+19	1.12E+19	8.92E+18	6.78E+18
45	1.48E+19	1.34E+19	1.12E+19	8.92E+18	6.79E+18
47.5	1.48E+19	1.34E+19	1.12E+19	8.93E+18	6.79E+18
50	1.48E+19	1.33E+19	1.12E+19	8.91E+18	6.78E+18
52.5	1.47E+19	1.33E+19	1.11E+19	8.87E+18	6.75E+18
55	1.47E+19	1.32E+19	1.11E+19	8.84E+18	6.73E+18
57.5	1.46E+19	1.31E+19	1.10E+19	8.79E+18	6.68E+18
60	1.44E+19	1.30E+19	1.09E+19	8.72E+18	6.64E+18
62.5	1.43E+19	1.29E+19	1.09E+19	8.66E+18	6.60E+18
65	1.43E+19	1.29E+19	1.08E+19	8.61E+18	6.56E+18
67.5	1.41E+19	1.27E+19	1.07E+19	8.55E+18	6.51E+18
70	1.40E+19	1.26E+19	1.06E+19	8.49E+18	6.46E+18
72.5	1.39E+19	1.25E+19	1.06E+19	8.43E+18	6.42E+18
75	1.38E+19	1.25E+19	1.05E+19	8.38E+18	6.38E+18
77.5	1.37E+19	1.24E+19	1.05E+19	8.35E+18	6.36E+18
80	1.37E+19	1.24E+19	1.04E+19	8.33E+18	6.34E+18
82.5	1.36E+19	1.23E+19	1.04E+19	8.28E+18	6.31E+18
85	1.36E+19	1.23E+19	1.03E+19	8.24E+18	6.28E+18
87.5	1.36E+19	1.23E+19	1.03E+19	8.25E+18	6.29E+18
90	1.36E+19	1.23E+19	1.03E+19	8.26E+18	6.30E+18

Appendix Table A- 2 Fast Fluence at Locations in the Top Guide for Weld H2 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	5.96E+18	5.29E+18	4.42E+18	3.51E+18	2.58E+18
2.5	5.92E+18	5.26E+18	4.39E+18	3.49E+18	2.56E+18
5	5.81E+18	5.16E+18	4.32E+18	3.43E+18	2.52E+18
7.5	5.65E+18	5.02E+18	4.20E+18	3.34E+18	2.45E+18
10	5.52E+18	4.91E+18	4.12E+18	3.27E+18	2.41E+18
12.5	5.51E+18	4.91E+18	4.11E+18	3.27E+18	2.40E+18
15	5.66E+18	5.03E+18	4.22E+18	3.35E+18	2.46E+18
17.5	5.92E+18	5.26E+18	4.40E+18	3.50E+18	2.57E+18
20	6.26E+18	5.55E+18	4.64E+18	3.69E+18	2.71E+18
22.5	6.55E+18	5.80E+18	4.84E+18	3.85E+18	2.82E+18
25	6.65E+18	5.88E+18	4.91E+18	3.90E+18	2.86E+18
27.5	6.57E+18	5.81E+18	4.86E+18	3.86E+18	2.84E+18
30	6.51E+18	5.77E+18	4.83E+18	3.84E+18	2.82E+18
32.5	6.69E+18	5.93E+18	4.96E+18	3.95E+18	2.90E+18
35	7.25E+18	6.41E+18	5.36E+18	4.26E+18	3.13E+18
37.5	8.15E+18	7.16E+18	5.98E+18	4.75E+18	3.48E+18
40	8.94E+18	7.83E+18	6.53E+18	5.17E+18	3.79E+18
42.5	9.28E+18	8.12E+18	6.78E+18	5.38E+18	3.94E+18
45	9.36E+18	8.19E+18	6.83E+18	5.42E+18	3.97E+18
47.5	9.28E+18	8.12E+18	6.77E+18	5.38E+18	3.94E+18
50	8.96E+18	7.84E+18	6.53E+18	5.18E+18	3.80E+18
52.5	8.16E+18	7.17E+18	5.99E+18	4.75E+18	3.49E+18
55	7.27E+18	6.42E+18	5.37E+18	4.27E+18	3.14E+18
57.5	6.71E+18	5.95E+18	4.98E+18	3.96E+18	2.91E+18
60	6.53E+18	5.79E+18	4.84E+18	3.85E+18	2.83E+18
62.5	6.59E+18	5.83E+18	4.88E+18	3.88E+18	2.85E+18
65	6.67E+18	5.89E+18	4.93E+18	3.91E+18	2.87E+18
67.5	6.58E+18	5.82E+18	4.87E+18	3.86E+18	2.83E+18
70	6.30E+18	5.58E+18	4.67E+18	3.71E+18	2.72E+18
72.5	5.96E+18	5.30E+18	4.43E+18	3.52E+18	2.59E+18
75	5.70E+18	5.07E+18	4.24E+18	3.38E+18	2.48E+18
77.5	5.55E+18	4.94E+18	4.14E+18	3.29E+18	2.42E+18
80	5.55E+18	4.94E+18	4.14E+18	3.29E+18	2.42E+18
82.5	5.68E+18	5.05E+18	4.23E+18	3.36E+18	2.47E+18
85	5.85E+18	5.19E+18	4.34E+18	3.45E+18	2.53E+18
87.5	5.96E+18	5.29E+18	4.42E+18	3.51E+18	2.58E+18
90	5.99E+18	5.32E+18	4.45E+18	3.53E+18	2.59E+18

Appendix Table A- 3 Fast Fluence at Locations in the Shroud for Weld H3 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	4.45E+19	3.68E+19	2.49E+19	1.59E+19	1.05E+19
2.5	4.32E+19	3.57E+19	2.42E+19	1.55E+19	1.02E+19
5	4.05E+19	3.35E+19	2.26E+19	1.45E+19	9.58E+18
7.5	3.50E+19	2.90E+19	1.97E+19	1.27E+19	8.44E+18
10	2.99E+19	2.49E+19	1.70E+19	1.11E+19	7.43E+18
12.5	2.93E+19	2.43E+19	1.67E+19	1.08E+19	7.28E+18
15	3.26E+19	2.72E+19	1.85E+19	1.20E+19	8.05E+18
17.5	3.93E+19	3.27E+19	2.23E+19	1.43E+19	9.56E+18
20	4.91E+19	4.07E+19	2.76E+19	1.76E+19	1.17E+19
22.5	5.79E+19	4.77E+19	3.22E+19	2.05E+19	1.35E+19
25	5.94E+19	4.89E+19	3.30E+19	2.10E+19	1.38E+19
27.5	5.38E+19	4.46E+19	3.03E+19	1.95E+19	1.29E+19
30	4.90E+19	4.07E+19	2.78E+19	1.80E+19	1.21E+19
32.5	5.19E+19	4.32E+19	2.96E+19	1.92E+19	1.29E+19
35	6.73E+19	5.61E+19	3.83E+19	2.47E+19	1.65E+19
37.5	9.86E+19	8.10E+19	5.46E+19	3.46E+19	2.27E+19
40	1.29E+20	1.04E+20	6.96E+19	4.37E+19	2.84E+19
42.5	1.33E+20	1.09E+20	7.36E+19	4.66E+19	3.05E+19
45	1.36E+20	1.12E+20	7.49E+19	4.73E+19	3.10E+19
47.5	1.33E+20	1.09E+20	7.36E+19	4.66E+19	3.05E+19
50	1.30E+20	1.05E+20	7.00E+19	4.39E+19	2.85E+19
52.5	9.82E+19	8.09E+19	5.46E+19	3.47E+19	2.28E+19
55	6.72E+19	5.60E+19	3.82E+19	2.46E+19	1.65E+19
57.5	5.19E+19	4.33E+19	2.95E+19	1.92E+19	1.29E+19
60	4.90E+19	4.07E+19	2.78E+19	1.80E+19	1.21E+19
62.5	5.39E+19	4.47E+19	3.04E+19	1.95E+19	1.30E+19
65	5.95E+19	4.89E+19	3.30E+19	2.10E+19	1.38E+19
67.5	5.81E+19	4.79E+19	3.24E+19	2.06E+19	1.36E+19
70	4.94E+19	4.09E+19	2.78E+19	1.78E+19	1.18E+19
72.5	3.97E+19	3.29E+19	2.24E+19	1.45E+19	9.64E+18
75	3.29E+19	2.74E+19	1.87E+19	1.21E+19	8.11E+18
77.5	2.94E+19	2.45E+19	1.68E+19	1.09E+19	7.32E+18
80	2.99E+19	2.49E+19	1.70E+19	1.11E+19	7.44E+18
82.5	3.50E+19	2.90E+19	1.97E+19	1.27E+19	8.45E+18
85	4.08E+19	3.37E+19	2.28E+19	1.46E+19	9.64E+18
87.5	4.34E+19	3.59E+19	2.43E+19	1.56E+19	1.03E+19
90	4.47E+19	3.70E+19	2.51E+19	1.60E+19	1.06E+19

Appendix Table A- 4 Fast Fluence at Locations in the Shroud for Weld H4 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	3.07E+20	2.78E+20	2.32E+20	1.84E+20	1.34E+20
2.5	2.99E+20	2.70E+20	2.25E+20	1.78E+20	1.30E+20
5	2.79E+20	2.53E+20	2.10E+20	1.66E+20	1.22E+20
7.5	2.39E+20	2.16E+20	1.81E+20	1.43E+20	1.05E+20
10	2.00E+20	1.82E+20	1.53E+20	1.22E+20	8.95E+19
12.5	1.97E+20	1.79E+20	1.50E+20	1.20E+20	8.83E+19
15	2.26E+20	2.06E+20	1.73E+20	1.37E+20	1.01E+20
17.5	2.83E+20	2.57E+20	2.15E+20	1.71E+20	1.25E+20
20	3.71E+20	3.36E+20	2.80E+20	2.22E+20	1.62E+20
22.5	4.52E+20	4.08E+20	3.39E+20	2.67E+20	1.95E+20
25	4.68E+20	4.23E+20	3.51E+20	2.78E+20	2.03E+20
27.5	4.13E+20	3.74E+20	3.13E+20	2.49E+20	1.83E+20
30	3.67E+20	3.33E+20	2.79E+20	2.22E+20	1.63E+20
32.5	3.88E+20	3.53E+20	2.97E+20	2.36E+20	1.74E+20
35	5.26E+20	4.78E+20	4.00E+20	3.18E+20	2.33E+20
37.5	8.22E+20	7.40E+20	6.13E+20	4.83E+20	3.51E+20
40	1.12E+21	1.00E+21	8.21E+20	6.42E+20	4.63E+20
42.5	1.18E+21	1.06E+21	8.75E+20	6.89E+20	4.99E+20
45	1.22E+21	1.10E+21	9.07E+20	7.10E+20	5.14E+20
47.5	1.18E+21	1.06E+21	8.78E+20	6.91E+20	5.01E+20
50	1.13E+21	1.01E+21	8.31E+20	6.51E+20	4.70E+20
52.5	8.21E+20	7.41E+20	6.17E+20	4.87E+20	3.55E+20
55	5.25E+20	4.79E+20	4.01E+20	3.18E+20	2.33E+20
57.5	3.90E+20	3.56E+20	2.95E+20	2.35E+20	1.74E+20
60	3.68E+20	3.34E+20	2.79E+20	2.23E+20	1.64E+20
62.5	4.15E+20	3.76E+20	3.14E+20	2.49E+20	1.82E+20
65	4.69E+20	4.23E+20	3.51E+20	2.77E+20	2.02E+20
67.5	4.53E+20	4.09E+20	3.40E+20	2.68E+20	1.95E+20
70	3.73E+20	3.38E+20	2.82E+20	2.23E+20	1.63E+20
72.5	2.86E+20	2.60E+20	2.17E+20	1.73E+20	1.27E+20
75	2.29E+20	2.08E+20	1.75E+20	1.39E+20	1.03E+20
77.5	2.00E+20	1.82E+20	1.53E+20	1.22E+20	9.05E+19
80	2.02E+20	1.84E+20	1.54E+20	1.23E+20	9.07E+19
82.5	2.41E+20	2.19E+20	1.83E+20	1.45E+20	1.06E+20
85	2.83E+20	2.57E+20	2.14E+20	1.70E+20	1.24E+20
87.5	3.02E+20	2.74E+20	2.28E+20	1.81E+20	1.32E+20
90	3.10E+20	2.81E+20	2.35E+20	1.86E+20	1.36E+20

Appendix Table A- 5 Fast Fluence at Locations in the Shroud for Weld H5 vs. Azimuth[a].

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	1.16E+20	1.05E+20	8.71E+19	6.88E+19	5.02E+19
2.5	1.12E+20	1.01E+20	8.42E+19	6.66E+19	4.86E+19
5	1.05E+20	9.47E+19	7.88E+19	6.22E+19	4.54E+19
7.5	9.14E+19	8.25E+19	6.87E+19	5.45E+19	3.99E+19
10	7.83E+19	7.11E+19	5.95E+19	4.74E+19	3.49E+19
12.5	7.89E+19	7.16E+19	6.00E+19	4.78E+19	3.52E+19
15	9.12E+19	8.29E+19	6.95E+19	5.53E+19	4.06E+19
17.5	1.14E+20	1.04E+20	8.65E+19	6.87E+19	5.03E+19
20	1.49E+20	1.35E+20	1.12E+20	8.86E+19	6.46E+19
22.5	1.80E+20	1.62E+20	1.34E+20	1.06E+20	7.69E+19
25	1.86E+20	1.68E+20	1.39E+20	1.10E+20	8.03E+19
27.5	1.67E+20	1.51E+20	1.26E+20	1.01E+20	7.37E+19
30	1.52E+20	1.38E+20	1.15E+20	9.15E+19	6.72E+19
32.5	1.62E+20	1.47E+20	1.23E+20	9.75E+19	7.16E+19
35	2.14E+20	1.94E+20	1.62E+20	1.28E+20	9.41E+19
37.5	3.24E+20	2.91E+20	2.41E+20	1.90E+20	1.38E+20
40	4.38E+20	3.90E+20	3.20E+20	2.50E+20	1.80E+20
42.5	4.68E+20	4.20E+20	3.47E+20	2.72E+20	1.97E+20
45	4.88E+20	4.37E+20	3.60E+20	2.81E+20	2.03E+20
47.5	4.67E+20	4.20E+20	3.47E+20	2.72E+20	1.97E+20
50	4.42E+20	3.94E+20	3.24E+20	2.53E+20	1.83E+20
52.5	3.24E+20	2.92E+20	2.43E+20	1.91E+20	1.40E+20
55	2.14E+20	1.94E+20	1.62E+20	1.29E+20	9.42E+19
57.5	1.63E+20	1.48E+20	1.23E+20	9.73E+19	7.17E+19
60	1.51E+20	1.38E+20	1.15E+20	9.13E+19	6.70E+19
62.5	1.67E+20	1.51E+20	1.26E+20	9.98E+19	7.30E+19
65	1.85E+20	1.67E+20	1.38E+20	1.09E+20	7.93E+19
67.5	1.79E+20	1.61E+20	1.34E+20	1.05E+20	7.66E+19
70	1.49E+20	1.34E+20	1.12E+20	8.86E+19	6.46E+19
72.5	1.15E+20	1.04E+20	8.68E+19	6.89E+19	5.05E+19
75	9.22E+19	8.37E+19	7.02E+19	5.58E+19	4.11E+19
77.5	8.03E+19	7.29E+19	6.11E+19	4.89E+19	3.62E+19
80	7.98E+19	7.24E+19	6.05E+19	4.83E+19	3.56E+19
82.5	9.30E+19	8.42E+19	7.03E+19	5.57E+19	4.08E+19
85	1.07E+20	9.71E+19	8.11E+19	6.41E+19	4.68E+19
87.5	1.14E+20	1.04E+20	8.61E+19	6.82E+19	4.98E+19
90	1.18E+20	1.07E+20	8.89E+19	7.04E+19	5.14E+19

[a] This table reports fluences for the full thickness shroud. These data must be interpolated at the jet pump scallops to obtain the OR fluence (see text for discussion).

Appendix Table A- 6 Fast Fluence at Locations in the Shroud for Weld H6A vs. Azimuth[a].

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	1.05E+17	9.35E+16	7.95E+16	6.55E+16	5.09E+16
2.5	1.06E+17	9.43E+16	8.00E+16	6.60E+16	5.13E+16
5	1.07E+17	9.56E+16	8.10E+16	6.67E+16	5.18E+16
7.5	1.08E+17	9.68E+16	8.21E+16	6.75E+16	5.24E+16
10	1.10E+17	9.85E+16	8.36E+16	6.87E+16	5.32E+16
12.5	1.14E+17	1.01E+17	8.60E+16	7.07E+16	5.49E+16
15	1.17E+17	1.05E+17	8.90E+16	7.32E+16	5.68E+16
17.5	1.21E+17	1.08E+17	9.20E+16	7.59E+16	5.91E+16
20	1.26E+17	1.12E+17	9.57E+16	7.90E+16	6.16E+16
22.5	1.30E+17	1.17E+17	9.94E+16	8.22E+16	6.42E+16
25	1.35E+17	1.21E+17	1.04E+17	8.58E+16	6.72E+16
27.5	1.41E+17	1.27E+17	1.08E+17	8.94E+16	7.01E+16
30	1.47E+17	1.32E+17	1.12E+17	9.27E+16	7.25E+16
32.5	1.51E+17	1.35E+17	1.16E+17	9.59E+16	7.50E+16
35	1.55E+17	1.40E+17	1.19E+17	9.89E+16	7.77E+16
37.5	1.60E+17	1.44E+17	1.23E+17	1.02E+17	8.05E+16
40	1.64E+17	1.48E+17	1.27E+17	1.06E+17	8.32E+16
42.5	1.69E+17	1.52E+17	1.30E+17	1.09E+17	8.59E+16
45	1.69E+17	1.53E+17	1.31E+17	1.10E+17	8.66E+16
47.5	1.69E+17	1.52E+17	1.31E+17	1.09E+17	8.61E+16
50	1.65E+17	1.48E+17	1.28E+17	1.06E+17	8.42E+16
52.5	1.61E+17	1.45E+17	1.24E+17	1.03E+17	8.17E+16
55	1.56E+17	1.40E+17	1.20E+17	9.93E+16	7.80E+16
57.5	1.52E+17	1.36E+17	1.16E+17	9.61E+16	7.51E+16
60	1.46E+17	1.31E+17	1.11E+17	9.22E+16	7.21E+16
62.5	1.41E+17	1.26E+17	1.07E+17	8.88E+16	6.93E+16
65	1.35E+17	1.21E+17	1.03E+17	8.54E+16	6.66E+16
67.5	1.30E+17	1.16E+17	9.93E+16	8.20E+16	6.40E+16
70	1.26E+17	1.12E+17	9.57E+16	7.91E+16	6.17E+16
72.5	1.22E+17	1.09E+17	9.25E+16	7.63E+16	5.94E+16
75	1.18E+17	1.05E+17	8.95E+16	7.38E+16	5.73E+16
77.5	1.15E+17	1.02E+17	8.70E+16	7.17E+16	5.59E+16
80	1.12E+17	9.98E+16	8.48E+16	6.97E+16	5.41E+16
82.5	1.09E+17	9.79E+16	8.31E+16	6.84E+16	5.31E+16
85	1.08E+17	9.66E+16	8.20E+16	6.77E+16	5.26E+16
87.5	1.07E+17	9.57E+16	8.12E+16	6.70E+16	5.22E+16
90	1.06E+17	9.48E+16	8.07E+16	6.65E+16	5.18E+16

[a] This table reports fluences for the full thickness shroud. These data must be interpolated at the jet pump scallops to obtain the OR fluence (see text for discussion).

Appendix Table A- 7 Fast Fluence at Locations in the Shroud for Weld H6B vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	1.91E+16	1.66E+16	1.40E+16	1.16E+16	8.97E+15
2.5	1.92E+16	1.67E+16	1.41E+16	1.17E+16	9.03E+15
5	1.95E+16	1.70E+16	1.44E+16	1.19E+16	9.19E+15
7.5	1.99E+16	1.74E+16	1.46E+16	1.21E+16	9.37E+15
10	2.02E+16	1.77E+16	1.49E+16	1.24E+16	9.56E+15
12.5	2.07E+16	1.81E+16	1.53E+16	1.27E+16	9.80E+15
15	2.12E+16	1.85E+16	1.56E+16	1.29E+16	1.00E+16
17.5	2.16E+16	1.89E+16	1.59E+16	1.32E+16	1.02E+16
20	2.21E+16	1.93E+16	1.63E+16	1.35E+16	1.05E+16
22.5	2.27E+16	1.98E+16	1.68E+16	1.39E+16	1.08E+16
25	2.35E+16	2.05E+16	1.73E+16	1.44E+16	1.12E+16
27.5	2.42E+16	2.11E+16	1.79E+16	1.49E+16	1.16E+16
30	2.50E+16	2.18E+16	1.85E+16	1.53E+16	1.19E+16
32.5	2.56E+16	2.24E+16	1.89E+16	1.57E+16	1.22E+16
35	2.61E+16	2.28E+16	1.93E+16	1.61E+16	1.25E+16
37.5	2.65E+16	2.32E+16	1.97E+16	1.64E+16	1.28E+16
40	2.69E+16	2.36E+16	2.00E+16	1.67E+16	1.30E+16
42.5	2.73E+16	2.39E+16	2.03E+16	1.69E+16	1.32E+16
45	2.73E+16	2.39E+16	2.03E+16	1.69E+16	1.32E+16
47.5	2.72E+16	2.39E+16	2.03E+16	1.69E+16	1.32E+16
50	2.69E+16	2.36E+16	2.00E+16	1.66E+16	1.30E+16
52.5	2.65E+16	2.32E+16	1.97E+16	1.64E+16	1.28E+16
55	2.62E+16	2.29E+16	1.94E+16	1.61E+16	1.25E+16
57.5	2.57E+16	2.24E+16	1.90E+16	1.58E+16	1.23E+16
60	2.50E+16	2.18E+16	1.84E+16	1.53E+16	1.19E+16
62.5	2.43E+16	2.12E+16	1.80E+16	1.49E+16	1.16E+16
65	2.36E+16	2.06E+16	1.74E+16	1.45E+16	1.12E+16
67.5	2.28E+16	1.99E+16	1.69E+16	1.40E+16	1.09E+16
70	2.21E+16	1.93E+16	1.63E+16	1.35E+16	1.05E+16
72.5	2.16E+16	1.89E+16	1.60E+16	1.32E+16	1.03E+16
75	2.12E+16	1.85E+16	1.56E+16	1.29E+16	1.00E+16
77.5	2.07E+16	1.80E+16	1.52E+16	1.26E+16	9.79E+15
80	2.03E+16	1.77E+16	1.50E+16	1.24E+16	9.59E+15
82.5	2.00E+16	1.74E+16	1.47E+16	1.22E+16	9.41E+15
85	1.96E+16	1.71E+16	1.44E+16	1.19E+16	9.24E+15
87.5	1.95E+16	1.69E+16	1.43E+16	1.18E+16	9.15E+15
90	1.93E+16	1.68E+16	1.42E+16	1.17E+16	9.09E+15

Appendix Table A- 8 Fast Fluence at Locations in the Shroud for Weld H7 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	4.51E+13	3.81E+13	3.07E+13	2.45E+13	1.87E+13
2.5	4.51E+13	3.82E+13	3.07E+13	2.46E+13	1.87E+13
5	4.54E+13	3.84E+13	3.08E+13	2.47E+13	1.89E+13
7.5	4.66E+13	3.94E+13	3.16E+13	2.51E+13	1.92E+13
10	4.63E+13	3.90E+13	3.14E+13	2.51E+13	1.92E+13
12.5	4.68E+13	3.96E+13	3.18E+13	2.55E+13	1.95E+13
15	4.74E+13	4.02E+13	3.23E+13	2.58E+13	1.97E+13
17.5	4.89E+13	4.12E+13	3.30E+13	2.62E+13	2.00E+13
20	4.97E+13	4.17E+13	3.34E+13	2.66E+13	2.03E+13
22.5	5.03E+13	4.23E+13	3.40E+13	2.71E+13	2.06E+13
25	5.13E+13	4.32E+13	3.47E+13	2.75E+13	2.10E+13
27.5	5.24E+13	4.41E+13	3.53E+13	2.81E+13	2.15E+13
30	5.30E+13	4.46E+13	3.59E+13	2.85E+13	2.18E+13
32.5	5.45E+13	4.55E+13	3.66E+13	2.90E+13	2.21E+13
35	5.50E+13	4.61E+13	3.71E+13	2.94E+13	2.25E+13
37.5	5.52E+13	4.65E+13	3.73E+13	2.98E+13	2.28E+13
40	5.53E+13	4.66E+13	3.74E+13	3.00E+13	2.29E+13
42.5	5.62E+13	4.72E+13	3.79E+13	3.02E+13	2.30E+13
45	5.59E+13	4.68E+13	3.78E+13	2.99E+13	2.29E+13
47.5	5.57E+13	4.67E+13	3.76E+13	2.99E+13	2.28E+13
50	5.55E+13	4.68E+13	3.75E+13	2.97E+13	2.27E+13
52.5	5.53E+13	4.65E+13	3.73E+13	2.97E+13	2.26E+13
55	5.49E+13	4.61E+13	3.70E+13	2.94E+13	2.24E+13
57.5	5.51E+13	4.60E+13	3.70E+13	2.92E+13	2.23E+13
60	5.37E+13	4.51E+13	3.62E+13	2.87E+13	2.20E+13
62.5	5.25E+13	4.42E+13	3.56E+13	2.84E+13	2.17E+13
65	5.14E+13	4.33E+13	3.48E+13	2.78E+13	2.13E+13
67.5	5.06E+13	4.26E+13	3.43E+13	2.73E+13	2.08E+13
70	4.98E+13	4.19E+13	3.36E+13	2.67E+13	2.04E+13
72.5	4.89E+13	4.12E+13	3.30E+13	2.64E+13	2.01E+13
75	4.81E+13	4.06E+13	3.26E+13	2.59E+13	1.97E+13
77.5	4.73E+13	4.00E+13	3.20E+13	2.56E+13	1.94E+13
80	4.69E+13	3.95E+13	3.17E+13	2.51E+13	1.92E+13
82.5	4.64E+13	3.91E+13	3.14E+13	2.50E+13	1.90E+13
85	4.58E+13	3.87E+13	3.10E+13	2.47E+13	1.89E+13
87.5	4.56E+13	3.85E+13	3.09E+13	2.47E+13	1.88E+13
90	4.55E+13	3.85E+13	3.09E+13	2.47E+13	1.88E+13

Appendix Table A- 9 Fast Fluence at Locations in the Top Guide for Welds V1 and V3 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
194.73	1.86E+19	1.69E+19	1.52E+19	1.32E+19	6.26E+18
196.56	1.81E+19	1.39E+19	1.15E+19	8.93E+18	4.63E+18
198.39	1.69E+19	1.10E+19	7.86E+18	5.51E+18	3.01E+18
200.22	1.53E+19	9.32E+18	5.76E+18	3.67E+18	1.93E+18
202.05	1.39E+19	8.29E+18	4.75E+18	2.77E+18	1.35E+18
203.73	1.28E+19	7.46E+18	4.19E+18	2.33E+18	1.07E+18

Appendix Table A- 10 Fast Fluence at Locations in the Top Guide for Welds V2 and V4 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
194.73	1.87E+19	1.70E+19	1.53E+19	1.33E+19	6.31E+18
196.56	1.83E+19	1.40E+19	1.16E+19	9.00E+18	4.67E+18
198.39	1.70E+19	1.11E+19	7.91E+18	5.54E+18	3.03E+18
200.22	1.54E+19	9.39E+18	5.80E+18	3.69E+18	1.94E+18
202.05	1.40E+19	8.36E+18	4.79E+18	2.79E+18	1.36E+18
203.73	1.28E+19	7.51E+18	4.23E+18	2.34E+18	1.08E+18

Appendix Table A- 11 Fast Fluence at Locations in the Top Guide for Weld V5 and V6 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
162.19	5.96E+18	5.29E+18	4.42E+18	3.51E+18	2.58E+18
164.19	8.63E+18	7.74E+18	6.39E+18	5.00E+18	3.62E+18
166.19	1.20E+19	1.10E+19	9.13E+18	7.14E+18	5.15E+18
168.19	1.40E+19	1.28E+19	1.07E+19	8.43E+18	6.13E+18
170.19	1.64E+19	1.50E+19	1.25E+19	9.73E+18	7.03E+18
172.19	1.82E+19	1.67E+19	1.40E+19	1.10E+19	7.98E+18
174.19	1.92E+19	1.85E+19	1.59E+19	1.24E+19	8.96E+18
176.19	2.00E+19	1.95E+19	1.71E+19	1.35E+19	9.79E+18
178.19	2.02E+19	1.97E+19	1.72E+19	1.37E+19	9.97E+18
180.19	2.01E+19	1.96E+19	1.71E+19	1.35E+19	9.83E+18
182.19	1.99E+19	1.93E+19	1.68E+19	1.32E+19	9.59E+18
184.19	1.94E+19	1.89E+19	1.64E+19	1.28E+19	9.28E+18
186.19	1.88E+19	1.83E+19	1.57E+19	1.23E+19	8.90E+18
188.19	1.80E+19	1.76E+19	1.50E+19	1.17E+19	8.45E+18
190.19	1.72E+19	1.68E+19	1.43E+19	1.11E+19	7.99E+18
192.19	1.64E+19	1.60E+19	1.36E+19	1.05E+19	7.52E+18
194.73	1.40E+19	1.32E+19	1.11E+19	8.66E+18	6.26E+18

Appendix Table A- 12 Fast Fluence at Locations in the Top Guide for Welds V7 and V8 vs. Radial Location.

Location in Shroud	Height above BAF (inches)				
	157.82	158.91	160.00	161.10	162.19
Radial Location (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
0	2.30E+21	1.93E+21	1.63E+21	1.38E+21	1.15E+21
4	2.31E+21	1.94E+21	1.64E+21	1.38E+21	1.15E+21
8	2.32E+21	1.95E+21	1.65E+21	1.39E+21	1.15E+21
12	2.32E+21	1.95E+21	1.65E+21	1.39E+21	1.15E+21
16	2.32E+21	1.95E+21	1.64E+21	1.38E+21	1.15E+21
20	2.31E+21	1.94E+21	1.64E+21	1.38E+21	1.15E+21
24	2.30E+21	1.93E+21	1.63E+21	1.37E+21	1.14E+21
28	2.28E+21	1.92E+21	1.62E+21	1.36E+21	1.13E+21
32	2.25E+21	1.89E+21	1.60E+21	1.34E+21	1.11E+21
36	2.22E+21	1.87E+21	1.57E+21	1.32E+21	1.10E+21
40	2.18E+21	1.83E+21	1.54E+21	1.30E+21	1.08E+21
44	2.13E+21	1.79E+21	1.51E+21	1.27E+21	1.05E+21
48	2.08E+21	1.74E+21	1.47E+21	1.23E+21	1.02E+21
52	2.01E+21	1.69E+21	1.42E+21	1.19E+21	9.92E+20
56	1.94E+21	1.63E+21	1.37E+21	1.15E+21	9.54E+20
60	1.85E+21	1.55E+21	1.30E+21	1.09E+21	9.09E+20
64	1.75E+21	1.46E+21	1.23E+21	1.03E+21	8.58E+20
68	1.63E+21	1.36E+21	1.15E+21	9.63E+20	7.98E+20
72	1.50E+21	1.25E+21	1.05E+21	8.81E+20	7.29E+20
76	1.34E+21	1.12E+21	9.38E+20	7.88E+20	6.52E+20
80	1.15E+21	9.62E+20	8.10E+20	6.82E+20	5.66E+20
84	9.48E+20	7.92E+20	6.66E+20	5.59E+20	4.64E+20
88	7.21E+20	6.07E+20	5.14E+20	4.35E+20	3.64E+20
92	5.14E+20	4.37E+20	3.75E+20	3.20E+20	2.70E+20
96	3.16E+20	2.97E+20	2.62E+20	2.23E+20	1.81E+20
100	9.04E+19	8.39E+19	6.91E+19	5.55E+19	4.34E+19
104	3.08E+19	2.78E+19	2.27E+19	1.87E+19	1.63E+19
108	1.04E+19	9.13E+18	8.02E+18	7.39E+18	7.65E+18
112.17	1.78E+18	1.71E+18	1.75E+18	2.04E+18	2.59E+18

Appendix Table A- 13 Fast Fluence at Locations in the Top Guide for Welds V9 and V11 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
151.94	4.32E+19	3.57E+19	2.42E+19	1.55E+19	1.02E+19
153.75	3.51E+19	2.84E+19	2.05E+19	1.39E+19	8.36E+18
155.57	2.83E+19	2.31E+19	1.67E+19	1.14E+19	6.87E+18
157.38	2.42E+19	1.91E+19	1.37E+19	9.48E+18	5.93E+18
159.19	1.84E+19	1.43E+19	1.07E+19	7.81E+18	5.57E+18

Appendix Table A- 14 Fast Fluence at Locations in the Top Guide for Welds V10 and V12 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
151.94	4.34E+19	3.59E+19	2.43E+19	1.56E+19	1.03E+19
153.75	3.52E+19	2.86E+19	2.06E+19	1.40E+19	8.39E+18
155.57	2.85E+19	2.32E+19	1.68E+19	1.15E+19	6.89E+18
157.38	2.43E+19	1.92E+19	1.37E+19	9.52E+18	5.95E+18
159.19	1.85E+19	1.44E+19	1.07E+19	7.84E+18	5.59E+18

Appendix Table A- 15 Fast Fluence at Locations in the Shroud for Weld V13 and V14 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
99.19	2.79E+20	2.53E+20	2.10E+20	1.66E+20	1.22E+20
102.00	2.79E+20	2.52E+20	2.10E+20	1.66E+20	1.21E+20
105.00	2.79E+20	2.52E+20	2.10E+20	1.66E+20	1.21E+20
108.00	2.78E+20	2.51E+20	2.09E+20	1.65E+20	1.21E+20
111.00	2.76E+20	2.50E+20	2.08E+20	1.64E+20	1.20E+20
114.00	2.74E+20	2.47E+20	2.06E+20	1.63E+20	1.19E+20
117.00	2.70E+20	2.44E+20	2.03E+20	1.61E+20	1.17E+20
120.00	2.64E+20	2.39E+20	1.99E+20	1.57E+20	1.15E+20
123.00	2.56E+20	2.31E+20	1.93E+20	1.52E+20	1.11E+20
126.00	2.44E+20	2.21E+20	1.84E+20	1.45E+20	1.06E+20
129.00	2.29E+20	2.07E+20	1.72E+20	1.36E+20	9.90E+19
132.00	2.08E+20	1.88E+20	1.57E+20	1.24E+20	9.02E+19
135.00	1.84E+20	1.66E+20	1.38E+20	1.09E+20	7.94E+19
138.00	1.55E+20	1.40E+20	1.17E+20	9.22E+19	6.73E+19
141.00	1.26E+20	1.14E+20	9.47E+19	7.49E+19	5.47E+19
144.00	9.64E+19	8.72E+19	7.27E+19	5.76E+19	4.21E+19
147.00	7.02E+19	6.36E+19	5.31E+19	4.21E+19	3.09E+19
150.00	4.90E+19	4.46E+19	3.74E+19	2.99E+19	2.20E+19
151.94	3.99E+19	3.61E+19	3.05E+19	2.49E+19	1.94E+19

Appendix Table A- 16 Fast Fluence at Locations in the Shroud for Weld V15 and V16 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
9.42	1.05E+20	9.47E+19	7.88E+19	6.22E+19	4.54E+19
12.00	1.19E+20	1.08E+20	8.95E+19	7.08E+19	5.17E+19
15.00	1.33E+20	1.20E+20	1.00E+20	7.93E+19	5.79E+19
18.00	1.44E+20	1.30E+20	1.09E+20	8.59E+19	6.28E+19
21.00	1.53E+20	1.39E+20	1.16E+20	9.14E+19	6.69E+19
24.00	1.61E+20	1.46E+20	1.21E+20	9.60E+19	7.02E+19
27.00	1.68E+20	1.52E+20	1.27E+20	1.00E+20	7.33E+19
30.00	1.74E+20	1.58E+20	1.32E+20	1.04E+20	7.62E+19
33.00	1.81E+20	1.64E+20	1.36E+20	1.08E+20	7.90E+19
36.00	1.87E+20	1.70E+20	1.41E+20	1.12E+20	8.18E+19
39.00	1.94E+20	1.75E+20	1.46E+20	1.16E+20	8.46E+19
42.00	2.00E+20	1.81E+20	1.51E+20	1.19E+20	8.73E+19
45.00	2.06E+20	1.86E+20	1.55E+20	1.23E+20	8.99E+19
48.00	2.12E+20	1.92E+20	1.60E+20	1.26E+20	9.25E+19
51.00	2.18E+20	1.97E+20	1.64E+20	1.30E+20	9.50E+19
54.00	2.23E+20	2.02E+20	1.68E+20	1.33E+20	9.75E+19
57.00	2.29E+20	2.07E+20	1.73E+20	1.37E+20	9.99E+19
60.00	2.35E+20	2.12E+20	1.77E+20	1.40E+20	1.02E+20
63.00	2.40E+20	2.17E+20	1.81E+20	1.43E+20	1.05E+20
66.00	2.45E+20	2.22E+20	1.85E+20	1.46E+20	1.07E+20
69.00	2.51E+20	2.27E+20	1.89E+20	1.49E+20	1.09E+20
72.00	2.55E+20	2.31E+20	1.93E+20	1.52E+20	1.11E+20
75.00	2.60E+20	2.35E+20	1.96E+20	1.55E+20	1.13E+20
78.00	2.65E+20	2.39E+20	1.99E+20	1.58E+20	1.15E+20
81.00	2.68E+20	2.43E+20	2.02E+20	1.60E+20	1.17E+20
84.00	2.72E+20	2.46E+20	2.05E+20	1.62E+20	1.18E+20
87.00	2.75E+20	2.48E+20	2.07E+20	1.64E+20	1.20E+20
90.00	2.77E+20	2.50E+20	2.08E+20	1.65E+20	1.20E+20
93.00	2.78E+20	2.51E+20	2.09E+20	1.66E+20	1.21E+20
96.00	2.79E+20	2.52E+20	2.10E+20	1.66E+20	1.21E+20
99.19	2.79E+20	2.53E+20	2.10E+20	1.66E+20	1.22E+20

Appendix Table A- 17 Fast Fluence at Locations in the Shroud for Welds V17 and V18 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
-24.93	1.07E+17	9.56E+16	8.10E+16	6.67E+16	5.18E+16
-23.31	1.46E+17	1.36E+17	1.17E+17	9.70E+16	7.58E+16
-21.31	2.40E+17	2.23E+17	1.91E+17	1.59E+17	1.25E+17
-19.31	3.99E+17	3.71E+17	3.20E+17	2.66E+17	2.10E+17
-17.31	6.75E+17	6.28E+17	5.46E+17	4.57E+17	3.60E+17
-15.31	1.16E+18	1.09E+18	9.58E+17	8.09E+17	6.35E+17
-13.31	2.08E+18	1.98E+18	1.75E+18	1.47E+18	1.15E+18
-11.31	3.88E+18	3.74E+18	3.29E+18	2.73E+18	2.10E+18
-9.31	7.48E+18	6.87E+18	5.82E+18	4.71E+18	3.55E+18
-7.31	1.10E+19	1.03E+19	8.77E+18	7.10E+18	5.34E+18
-5.31	1.62E+19	1.51E+19	1.29E+19	1.04E+19	7.81E+18
-3.31	2.33E+19	2.18E+19	1.85E+19	1.49E+19	1.12E+19
-1.31	3.37E+19	3.13E+19	2.65E+19	2.13E+19	1.58E+19
0.69	4.51E+19	4.18E+19	3.52E+19	2.82E+19	2.09E+19
2.69	5.86E+19	5.41E+19	4.55E+19	3.64E+19	2.69E+19
4.69	7.37E+19	6.79E+19	5.70E+19	4.55E+19	3.35E+19
6.69	8.68E+19	8.00E+19	6.71E+19	5.35E+19	3.95E+19
8.69	1.01E+20	9.27E+19	7.77E+19	6.20E+19	4.56E+19
9.42	1.06E+20	9.75E+19	8.18E+19	6.51E+19	4.80E+19

Appendix Table A- 18 Fast Fluence at Locations in the Shroud for Welds V19 and V21 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
-33.87	3.30E+16	2.17E+16	1.55E+16	9.28E+15	4.99E+15
-31.87	5.67E+16	3.93E+16	2.63E+16	1.69E+16	8.90E+15
-29.87	9.02E+16	6.42E+16	4.34E+16	2.78E+16	1.47E+16
-27.87	1.43E+17	1.05E+17	7.07E+16	4.53E+16	2.41E+16
-25.87	2.27E+17	1.71E+17	1.11E+17	7.35E+16	3.92E+16
-24.93	2.77E+17	2.12E+17	1.34E+17	9.13E+16	4.90E+16

Appendix Table A- 19 Fast Fluence at Locations in the Shroud for Welds V20 and V22 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
-33.87	3.32E+16	2.19E+16	1.56E+16	9.35E+15	5.04E+15
-31.87	5.72E+16	3.97E+16	2.65E+16	1.70E+16	8.99E+15
-29.87	9.12E+16	6.51E+16	4.39E+16	2.81E+16	1.49E+16
-27.87	1.45E+17	1.06E+17	7.15E+16	4.58E+16	2.45E+16
-25.87	2.31E+17	1.73E+17	1.13E+17	7.45E+16	3.98E+16
-24.93	2.82E+17	2.16E+17	1.36E+17	9.26E+16	4.98E+16

Appendix Table A- 20 Fast Fluence at Locations in the Shroud for Welds V23 and V24 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at EOC 21 (28.088 EFPY) n/cm^2				
-65.81	4.54E+13	3.84E+13	3.08E+13	2.47E+13	1.89E+13
-63.87	6.53E+13	5.48E+13	4.45E+13	3.49E+13	2.58E+13
-61.87	9.69E+13	8.21E+13	6.59E+13	5.20E+13	3.81E+13
-59.87	1.42E+14	1.20E+14	9.67E+13	7.63E+13	5.56E+13
-57.87	2.07E+14	1.77E+14	1.42E+14	1.11E+14	8.12E+13
-55.87	3.08E+14	2.60E+14	2.09E+14	1.64E+14	1.19E+14
-53.87	4.54E+14	3.88E+14	3.09E+14	2.42E+14	1.76E+14
-51.87	6.75E+14	5.72E+14	4.57E+14	3.57E+14	2.59E+14
-49.87	9.93E+14	8.41E+14	6.71E+14	5.23E+14	3.79E+14
-47.87	1.46E+15	1.23E+15	9.79E+14	7.63E+14	5.52E+14
-45.87	2.10E+15	1.78E+15	1.43E+15	1.11E+15	8.00E+14
-43.87	3.14E+15	2.67E+15	2.13E+15	1.65E+15	1.18E+15
-41.87	4.58E+15	3.90E+15	3.11E+15	2.39E+15	1.71E+15
-39.87	6.61E+15	5.70E+15	4.50E+15	3.44E+15	2.44E+15
-37.87	9.72E+15	8.20E+15	6.44E+15	4.94E+15	3.50E+15
-35.87	1.32E+16	1.12E+16	9.03E+15	7.21E+15	5.17E+15
-33.87	1.95E+16	1.70E+16	1.44E+16	1.19E+16	9.19E+15

B
SHROUD/TOP GUIDE WELD FLUENCE RESULTS AFTER 35 EFPY EXPOSURE

This appendix contains calculated fast fluence values (fluence for neutrons with energy above 1 MeV) for welds in the shroud and top guide. Fluence values for each weld are given at the IR, OR, and at positions 1/4, 1/2, and 3/4 of the distance between the IR and OR for an exposure of 35 EFPY (6.912 EFPY beyond the calculated end of cycle 21). Values are tabulated versus azimuthal angle for horizontal welds, and versus height above BAF for vertical welds.

Welds V7 and V8 in the top guide extend from 0 radius to the outside of the guide assembly. For these welds, fluence values are given as a function of radius for 5 axial heights.

As discussed in Section 4, scallops are cut in the outside of the shroud at angles of approximately 18, 33.5, 44.5, 59, 69, and 84.5 degrees. These scallops affect welds H5 and H6A and reduce the outside radius of the shroud at angles near these values. The extent of the region of removed material is between 1.5 and 2 degrees for weld H5 and between 2 and 3 degrees for weld H6A. Thus, the angles in the tabulated fluence data that are affected include 17.5, 32.5, 45, 60, 67.5, 70, and 85 degrees and, to a lesser extent, 35 degrees, for weld H5. For weld H6A, these same angles are affected with possibly some effect at neighboring angles. The depth of the scallops is sufficient that at weld H6A, material may be removed below the 3/4T position. The tables do not reflect any change in shroud OR and thus the fluence at the affected angles is tabulated for locations that are actually outside the shroud.

Appendix Table B- 1 Fast Fluence at Locations in the Top Guide for Weld H1 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	2.03E+19	1.83E+19	1.54E+19	1.23E+19	9.40E+18
2.5	2.03E+19	1.83E+19	1.54E+19	1.23E+19	9.38E+18
5	2.03E+19	1.83E+19	1.54E+19	1.23E+19	9.38E+18
7.5	2.03E+19	1.83E+19	1.54E+19	1.23E+19	9.39E+18
10	2.04E+19	1.85E+19	1.55E+19	1.24E+19	9.46E+18
12.5	2.05E+19	1.85E+19	1.56E+19	1.25E+19	9.49E+18
15	2.06E+19	1.86E+19	1.57E+19	1.25E+19	9.53E+18
17.5	2.07E+19	1.87E+19	1.57E+19	1.26E+19	9.57E+18
20	2.09E+19	1.89E+19	1.59E+19	1.27E+19	9.64E+18
22.5	2.11E+19	1.90E+19	1.60E+19	1.28E+19	9.72E+18
25	2.13E+19	1.92E+19	1.61E+19	1.28E+19	9.78E+18
27.5	2.14E+19	1.93E+19	1.62E+19	1.29E+19	9.84E+18
30	2.16E+19	1.95E+19	1.63E+19	1.30E+19	9.92E+18
32.5	2.18E+19	1.96E+19	1.65E+19	1.31E+19	9.98E+18
35	2.19E+19	1.97E+19	1.65E+19	1.32E+19	1.00E+19
37.5	2.20E+19	1.98E+19	1.66E+19	1.32E+19	1.01E+19
40	2.22E+19	1.99E+19	1.67E+19	1.33E+19	1.01E+19
42.5	2.22E+19	2.00E+19	1.67E+19	1.33E+19	1.01E+19
45	2.22E+19	2.00E+19	1.67E+19	1.34E+19	1.02E+19
47.5	2.22E+19	2.00E+19	1.68E+19	1.34E+19	1.02E+19
50	2.22E+19	1.99E+19	1.67E+19	1.33E+19	1.01E+19
52.5	2.21E+19	1.98E+19	1.66E+19	1.33E+19	1.01E+19
55	2.19E+19	1.98E+19	1.66E+19	1.32E+19	1.01E+19
57.5	2.19E+19	1.97E+19	1.65E+19	1.31E+19	1.00E+19
60	2.16E+19	1.95E+19	1.64E+19	1.31E+19	9.94E+18
62.5	2.15E+19	1.94E+19	1.63E+19	1.30E+19	9.88E+18
65	2.14E+19	1.92E+19	1.62E+19	1.29E+19	9.82E+18
67.5	2.12E+19	1.91E+19	1.60E+19	1.28E+19	9.75E+18
70	2.10E+19	1.89E+19	1.59E+19	1.27E+19	9.68E+18
72.5	2.08E+19	1.88E+19	1.58E+19	1.26E+19	9.62E+18
75	2.07E+19	1.87E+19	1.57E+19	1.26E+19	9.57E+18
77.5	2.06E+19	1.86E+19	1.57E+19	1.25E+19	9.53E+18
80	2.05E+19	1.86E+19	1.56E+19	1.25E+19	9.51E+18
82.5	2.04E+19	1.85E+19	1.55E+19	1.24E+19	9.45E+18
85	2.03E+19	1.84E+19	1.55E+19	1.24E+19	9.41E+18
87.5	2.04E+19	1.84E+19	1.55E+19	1.24E+19	9.43E+18
90	2.04E+19	1.84E+19	1.55E+19	1.24E+19	9.44E+18

Appendix Table B- 2 Fast Fluence at Locations in the Top Guide for Weld H2 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	8.95E+18	7.94E+18	6.64E+18	5.28E+18	3.87E+18
2.5	8.90E+18	7.90E+18	6.60E+18	5.25E+18	3.85E+18
5	8.73E+18	7.75E+18	6.48E+18	5.15E+18	3.78E+18
7.5	8.47E+18	7.54E+18	6.31E+18	5.01E+18	3.68E+18
10	8.28E+18	7.37E+18	6.18E+18	4.91E+18	3.61E+18
12.5	8.27E+18	7.37E+18	6.17E+18	4.91E+18	3.61E+18
15	8.49E+18	7.55E+18	6.33E+18	5.03E+18	3.70E+18
17.5	8.89E+18	7.90E+18	6.61E+18	5.26E+18	3.86E+18
20	9.41E+18	8.34E+18	6.97E+18	5.54E+18	4.06E+18
22.5	9.86E+18	8.71E+18	7.28E+18	5.78E+18	4.24E+18
25	9.99E+18	8.83E+18	7.38E+18	5.86E+18	4.30E+18
27.5	9.86E+18	8.73E+18	7.30E+18	5.80E+18	4.26E+18
30	9.76E+18	8.65E+18	7.24E+18	5.76E+18	4.23E+18
32.5	1.00E+19	8.88E+18	7.44E+18	5.92E+18	4.35E+18
35	1.09E+19	9.60E+18	8.03E+18	6.38E+18	4.69E+18
37.5	1.22E+19	1.07E+19	8.96E+18	7.11E+18	5.22E+18
40	1.34E+19	1.17E+19	9.79E+18	7.76E+18	5.69E+18
42.5	1.39E+19	1.22E+19	1.02E+19	8.07E+18	5.92E+18
45	1.41E+19	1.23E+19	1.03E+19	8.14E+18	5.97E+18
47.5	1.39E+19	1.22E+19	1.02E+19	8.07E+18	5.92E+18
50	1.34E+19	1.18E+19	9.80E+18	7.77E+18	5.70E+18
52.5	1.22E+19	1.08E+19	8.97E+18	7.12E+18	5.23E+18
55	1.09E+19	9.61E+18	8.04E+18	6.39E+18	4.70E+18
57.5	1.00E+19	8.90E+18	7.45E+18	5.93E+18	4.36E+18
60	9.78E+18	8.67E+18	7.26E+18	5.77E+18	4.24E+18
62.5	9.88E+18	8.74E+18	7.32E+18	5.81E+18	4.27E+18
65	1.00E+19	8.85E+18	7.40E+18	5.87E+18	4.31E+18
67.5	9.89E+18	8.75E+18	7.31E+18	5.80E+18	4.26E+18
70	9.46E+18	8.38E+18	7.01E+18	5.57E+18	4.09E+18
72.5	8.95E+18	7.95E+18	6.65E+18	5.29E+18	3.88E+18
75	8.54E+18	7.60E+18	6.37E+18	5.06E+18	3.72E+18
77.5	8.32E+18	7.41E+18	6.20E+18	4.93E+18	3.63E+18
80	8.31E+18	7.41E+18	6.20E+18	4.93E+18	3.62E+18
82.5	8.51E+18	7.57E+18	6.34E+18	5.04E+18	3.70E+18
85	8.77E+18	7.79E+18	6.51E+18	5.18E+18	3.80E+18
87.5	8.94E+18	7.93E+18	6.64E+18	5.27E+18	3.87E+18
90	9.00E+18	7.98E+18	6.68E+18	5.30E+18	3.89E+18

Appendix Table B- 3 Fast Fluence at Locations in the Shroud for Weld H3 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	6.65E+19	5.50E+19	3.73E+19	2.38E+19	1.57E+19
2.5	6.47E+19	5.35E+19	3.62E+19	2.31E+19	1.53E+19
5	6.07E+19	5.01E+19	3.39E+19	2.16E+19	1.43E+19
7.5	5.23E+19	4.32E+19	2.93E+19	1.88E+19	1.25E+19
10	4.44E+19	3.70E+19	2.53E+19	1.64E+19	1.10E+19
12.5	4.34E+19	3.61E+19	2.47E+19	1.60E+19	1.08E+19
15	4.85E+19	4.04E+19	2.75E+19	1.78E+19	1.19E+19
17.5	5.88E+19	4.89E+19	3.33E+19	2.14E+19	1.43E+19
20	7.37E+19	6.11E+19	4.14E+19	2.64E+19	1.75E+19
22.5	8.73E+19	7.18E+19	4.85E+19	3.08E+19	2.03E+19
25	8.96E+19	7.36E+19	4.97E+19	3.16E+19	2.08E+19
27.5	8.06E+19	6.69E+19	4.55E+19	2.92E+19	1.94E+19
30	7.31E+19	6.07E+19	4.14E+19	2.68E+19	1.79E+19
32.5	7.71E+19	6.42E+19	4.40E+19	2.85E+19	1.92E+19
35	1.00E+20	8.36E+19	5.70E+19	3.68E+19	2.46E+19
37.5	1.48E+20	1.21E+20	8.17E+19	5.18E+19	3.40E+19
40	1.94E+20	1.57E+20	1.05E+20	6.57E+19	4.26E+19
42.5	2.01E+20	1.65E+20	1.11E+20	7.02E+19	4.59E+19
45	2.06E+20	1.68E+20	1.13E+20	7.13E+19	4.67E+19
47.5	2.00E+20	1.65E+20	1.11E+20	7.02E+19	4.59E+19
50	1.96E+20	1.58E+20	1.05E+20	6.59E+19	4.28E+19
52.5	1.47E+20	1.21E+20	8.18E+19	5.19E+19	3.41E+19
55	1.00E+20	8.35E+19	5.69E+19	3.67E+19	2.45E+19
57.5	7.72E+19	6.45E+19	4.39E+19	2.85E+19	1.92E+19
60	7.31E+19	6.08E+19	4.15E+19	2.68E+19	1.79E+19
62.5	8.09E+19	6.70E+19	4.56E+19	2.92E+19	1.94E+19
65	8.96E+19	7.36E+19	4.97E+19	3.16E+19	2.08E+19
67.5	8.76E+19	7.21E+19	4.88E+19	3.10E+19	2.04E+19
70	7.43E+19	6.15E+19	4.17E+19	2.67E+19	1.76E+19
72.5	5.93E+19	4.93E+19	3.36E+19	2.16E+19	1.44E+19
75	4.90E+19	4.07E+19	2.78E+19	1.80E+19	1.20E+19
77.5	4.37E+19	3.64E+19	2.49E+19	1.61E+19	1.08E+19
80	4.45E+19	3.71E+19	2.53E+19	1.64E+19	1.10E+19
82.5	5.22E+19	4.33E+19	2.94E+19	1.89E+19	1.26E+19
85	6.12E+19	5.05E+19	3.42E+19	2.18E+19	1.44E+19
87.5	6.51E+19	5.38E+19	3.65E+19	2.33E+19	1.54E+19
90	6.69E+19	5.54E+19	3.75E+19	2.40E+19	1.58E+19

Appendix Table B- 4 Fast Fluence at Locations in the Shroud for Weld H4 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	4.17E+20	3.78E+20	3.15E+20	2.50E+20	1.82E+20
2.5	4.06E+20	3.68E+20	3.06E+20	2.42E+20	1.77E+20
5	3.80E+20	3.44E+20	2.86E+20	2.26E+20	1.65E+20
7.5	3.24E+20	2.93E+20	2.45E+20	1.94E+20	1.42E+20
10	2.69E+20	2.45E+20	2.06E+20	1.64E+20	1.21E+20
12.5	2.64E+20	2.40E+20	2.02E+20	1.61E+20	1.19E+20
15	3.04E+20	2.76E+20	2.32E+20	1.84E+20	1.36E+20
17.5	3.81E+20	3.47E+20	2.90E+20	2.31E+20	1.69E+20
20	5.02E+20	4.55E+20	3.79E+20	3.00E+20	2.19E+20
22.5	6.16E+20	5.55E+20	4.61E+20	3.64E+20	2.65E+20
25	6.39E+20	5.76E+20	4.79E+20	3.79E+20	2.76E+20
27.5	5.61E+20	5.09E+20	4.25E+20	3.38E+20	2.48E+20
30	4.96E+20	4.51E+20	3.77E+20	3.00E+20	2.21E+20
32.5	5.24E+20	4.77E+20	4.00E+20	3.18E+20	2.34E+20
35	7.12E+20	6.48E+20	5.41E+20	4.30E+20	3.16E+20
37.5	1.12E+21	1.01E+21	8.36E+20	6.59E+20	4.78E+20
40	1.54E+21	1.37E+21	1.12E+21	8.78E+20	6.33E+20
42.5	1.61E+21	1.45E+21	1.20E+21	9.42E+20	6.82E+20
45	1.68E+21	1.50E+21	1.24E+21	9.71E+20	7.02E+20
47.5	1.61E+21	1.45E+21	1.20E+21	9.45E+20	6.85E+20
50	1.56E+21	1.39E+21	1.14E+21	8.92E+20	6.44E+20
52.5	1.12E+21	1.01E+21	8.42E+20	6.65E+20	4.85E+20
55	7.13E+20	6.50E+20	5.44E+20	4.32E+20	3.17E+20
57.5	5.28E+20	4.82E+20	4.00E+20	3.18E+20	2.36E+20
60	4.99E+20	4.54E+20	3.79E+20	3.02E+20	2.22E+20
62.5	5.66E+20	5.13E+20	4.29E+20	3.40E+20	2.49E+20
65	6.41E+20	5.78E+20	4.80E+20	3.79E+20	2.76E+20
67.5	6.19E+20	5.58E+20	4.64E+20	3.67E+20	2.67E+20
70	5.07E+20	4.60E+20	3.84E+20	3.04E+20	2.22E+20
72.5	3.88E+20	3.52E+20	2.94E+20	2.34E+20	1.72E+20
75	3.09E+20	2.81E+20	2.36E+20	1.88E+20	1.38E+20
77.5	2.70E+20	2.45E+20	2.06E+20	1.65E+20	1.22E+20
80	2.74E+20	2.49E+20	2.09E+20	1.67E+20	1.23E+20
82.5	3.29E+20	2.98E+20	2.49E+20	1.98E+20	1.45E+20
85	3.88E+20	3.52E+20	2.94E+20	2.33E+20	1.70E+20
87.5	4.14E+20	3.75E+20	3.13E+20	2.48E+20	1.81E+20
90	4.25E+20	3.85E+20	3.22E+20	2.55E+20	1.86E+20

Appendix Table B- 5 Fast Fluence at Locations in the Shroud for Weld H5 vs. Azimuth[a].

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	1.69E+20	1.53E+20	1.27E+20	1.00E+20	7.32E+19
2.5	1.63E+20	1.48E+20	1.23E+20	9.69E+19	7.07E+19
5	1.52E+20	1.37E+20	1.14E+20	9.00E+19	6.57E+19
7.5	1.31E+20	1.18E+20	9.85E+19	7.81E+19	5.71E+19
10	1.11E+20	1.01E+20	8.42E+19	6.70E+19	4.93E+19
12.5	1.10E+20	1.00E+20	8.39E+19	6.68E+19	4.92E+19
15	1.27E+20	1.15E+20	9.66E+19	7.69E+19	5.64E+19
17.5	1.58E+20	1.44E+20	1.20E+20	9.55E+19	6.99E+19
20	2.08E+20	1.88E+20	1.56E+20	1.24E+20	9.02E+19
22.5	2.53E+20	2.27E+20	1.88E+20	1.48E+20	1.08E+20
25	2.62E+20	2.36E+20	1.96E+20	1.55E+20	1.13E+20
27.5	2.35E+20	2.13E+20	1.78E+20	1.41E+20	1.04E+20
30	2.12E+20	1.93E+20	1.61E+20	1.28E+20	9.41E+19
32.5	2.26E+20	2.05E+20	1.72E+20	1.36E+20	1.00E+20
35	3.01E+20	2.73E+20	2.28E+20	1.81E+20	1.32E+20
37.5	4.61E+20	4.14E+20	3.42E+20	2.69E+20	1.95E+20
40	6.25E+20	5.57E+20	4.57E+20	3.57E+20	2.57E+20
42.5	6.65E+20	5.97E+20	4.93E+20	3.87E+20	2.80E+20
45	6.90E+20	6.19E+20	5.09E+20	3.98E+20	2.88E+20
47.5	6.65E+20	5.97E+20	4.94E+20	3.88E+20	2.80E+20
50	6.33E+20	5.64E+20	4.63E+20	3.62E+20	2.61E+20
52.5	4.62E+20	4.16E+20	3.46E+20	2.72E+20	1.99E+20
55	3.01E+20	2.74E+20	2.29E+20	1.81E+20	1.33E+20
57.5	2.27E+20	2.07E+20	1.71E+20	1.36E+20	1.00E+20
60	2.12E+20	1.92E+20	1.60E+20	1.27E+20	9.35E+19
62.5	2.34E+20	2.12E+20	1.77E+20	1.40E+20	1.02E+20
65	2.60E+20	2.34E+20	1.94E+20	1.53E+20	1.11E+20
67.5	2.50E+20	2.25E+20	1.87E+20	1.47E+20	1.07E+20
70	2.07E+20	1.87E+20	1.56E+20	1.24E+20	9.01E+19
72.5	1.60E+20	1.45E+20	1.21E+20	9.60E+19	7.03E+19
75	1.29E+20	1.17E+20	9.78E+19	7.78E+19	5.73E+19
77.5	1.13E+20	1.02E+20	8.56E+19	6.85E+19	5.07E+19
80	1.13E+20	1.02E+20	8.57E+19	6.84E+19	5.03E+19
82.5	1.33E+20	1.20E+20	1.01E+20	7.96E+19	5.83E+19
85	1.55E+20	1.40E+20	1.17E+20	9.25E+19	6.75E+19
87.5	1.66E+20	1.50E+20	1.25E+20	9.88E+19	7.22E+19
90	1.71E+20	1.55E+20	1.29E+20	1.02E+20	7.45E+19

[a] This table reports fluences for the full thickness shroud. These data must be interpolated at the jet pump scallops to obtain the OR fluence (see text for discussion).

Appendix Table B- 6 Fast Fluence at Locations in the Shroud for Weld H6A vs. Azimuth[a].

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	1.60E+17	1.43E+17	1.21E+17	1.00E+17	7.79E+16
2.5	1.61E+17	1.44E+17	1.22E+17	1.01E+17	7.84E+16
5	1.63E+17	1.46E+17	1.24E+17	1.02E+17	7.90E+16
7.5	1.65E+17	1.47E+17	1.25E+17	1.03E+17	7.97E+16
10	1.67E+17	1.49E+17	1.27E+17	1.04E+17	8.07E+16
12.5	1.72E+17	1.53E+17	1.30E+17	1.07E+17	8.30E+16
15	1.77E+17	1.58E+17	1.34E+17	1.10E+17	8.57E+16
17.5	1.82E+17	1.63E+17	1.38E+17	1.14E+17	8.90E+16
20	1.88E+17	1.69E+17	1.44E+17	1.19E+17	9.27E+16
22.5	1.95E+17	1.75E+17	1.49E+17	1.23E+17	9.64E+16
25	2.03E+17	1.82E+17	1.55E+17	1.29E+17	1.01E+17
27.5	2.11E+17	1.89E+17	1.62E+17	1.34E+17	1.05E+17
30	2.20E+17	1.97E+17	1.68E+17	1.39E+17	1.09E+17
32.5	2.27E+17	2.03E+17	1.73E+17	1.44E+17	1.13E+17
35	2.32E+17	2.09E+17	1.79E+17	1.48E+17	1.17E+17
37.5	2.40E+17	2.16E+17	1.85E+17	1.53E+17	1.21E+17
40	2.47E+17	2.22E+17	1.91E+17	1.59E+17	1.25E+17
42.5	2.54E+17	2.29E+17	1.97E+17	1.64E+17	1.30E+17
45	2.55E+17	2.31E+17	1.98E+17	1.66E+17	1.31E+17
47.5	2.54E+17	2.29E+17	1.97E+17	1.65E+17	1.30E+17
50	2.48E+17	2.23E+17	1.92E+17	1.60E+17	1.27E+17
52.5	2.41E+17	2.17E+17	1.87E+17	1.56E+17	1.23E+17
55	2.34E+17	2.10E+17	1.80E+17	1.49E+17	1.17E+17
57.5	2.28E+17	2.04E+17	1.74E+17	1.44E+17	1.13E+17
60	2.19E+17	1.96E+17	1.67E+17	1.38E+17	1.08E+17
62.5	2.11E+17	1.88E+17	1.61E+17	1.33E+17	1.04E+17
65	2.02E+17	1.81E+17	1.55E+17	1.28E+17	9.99E+16
67.5	1.95E+17	1.74E+17	1.49E+17	1.23E+17	9.62E+16
70	1.88E+17	1.69E+17	1.44E+17	1.19E+17	9.27E+16
72.5	1.83E+17	1.64E+17	1.39E+17	1.15E+17	8.95E+16
75	1.78E+17	1.59E+17	1.35E+17	1.11E+17	8.66E+16
77.5	1.74E+17	1.55E+17	1.32E+17	1.09E+17	8.47E+16
80	1.69E+17	1.51E+17	1.29E+17	1.06E+17	8.21E+16
82.5	1.66E+17	1.49E+17	1.26E+17	1.04E+17	8.08E+16
85	1.64E+17	1.47E+17	1.25E+17	1.03E+17	8.01E+16
87.5	1.63E+17	1.46E+17	1.24E+17	1.02E+17	7.96E+16
90	1.62E+17	1.44E+17	1.23E+17	1.01E+17	7.89E+16

[a] This table reports fluences for the full thickness shroud. These data must be interpolated at the jet pump scallops to obtain the OR fluence (see text for discussion).

Appendix Table B- 7 Fast Fluence at Locations in the Shroud for Weld H6B vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	2.83E+16	2.47E+16	2.09E+16	1.73E+16	1.34E+16
2.5	2.86E+16	2.49E+16	2.10E+16	1.74E+16	1.35E+16
5	2.90E+16	2.53E+16	2.14E+16	1.77E+16	1.37E+16
7.5	2.96E+16	2.58E+16	2.18E+16	1.80E+16	1.40E+16
10	3.00E+16	2.62E+16	2.21E+16	1.84E+16	1.42E+16
12.5	3.07E+16	2.68E+16	2.26E+16	1.88E+16	1.46E+16
15	3.13E+16	2.73E+16	2.31E+16	1.92E+16	1.49E+16
17.5	3.19E+16	2.78E+16	2.35E+16	1.95E+16	1.51E+16
20	3.25E+16	2.85E+16	2.41E+16	2.00E+16	1.55E+16
22.5	3.35E+16	2.92E+16	2.48E+16	2.05E+16	1.59E+16
25	3.45E+16	3.02E+16	2.55E+16	2.12E+16	1.65E+16
27.5	3.57E+16	3.11E+16	2.64E+16	2.19E+16	1.70E+16
30	3.68E+16	3.21E+16	2.72E+16	2.26E+16	1.76E+16
32.5	3.76E+16	3.29E+16	2.79E+16	2.31E+16	1.80E+16
35	3.84E+16	3.36E+16	2.84E+16	2.37E+16	1.84E+16
37.5	3.90E+16	3.41E+16	2.90E+16	2.42E+16	1.88E+16
40	3.97E+16	3.48E+16	2.96E+16	2.47E+16	1.92E+16
42.5	4.04E+16	3.54E+16	3.00E+16	2.50E+16	1.95E+16
45	4.04E+16	3.53E+16	3.00E+16	2.50E+16	1.96E+16
47.5	4.03E+16	3.54E+16	3.00E+16	2.50E+16	1.95E+16
50	3.98E+16	3.49E+16	2.96E+16	2.47E+16	1.92E+16
52.5	3.92E+16	3.43E+16	2.91E+16	2.43E+16	1.89E+16
55	3.86E+16	3.38E+16	2.86E+16	2.38E+16	1.85E+16
57.5	3.78E+16	3.31E+16	2.80E+16	2.33E+16	1.81E+16
60	3.67E+16	3.21E+16	2.71E+16	2.25E+16	1.75E+16
62.5	3.57E+16	3.12E+16	2.64E+16	2.20E+16	1.71E+16
65	3.47E+16	3.03E+16	2.57E+16	2.13E+16	1.65E+16
67.5	3.36E+16	2.94E+16	2.49E+16	2.06E+16	1.60E+16
70	3.26E+16	2.85E+16	2.41E+16	2.00E+16	1.55E+16
72.5	3.19E+16	2.79E+16	2.36E+16	1.95E+16	1.52E+16
75	3.13E+16	2.74E+16	2.31E+16	1.91E+16	1.49E+16
77.5	3.07E+16	2.68E+16	2.26E+16	1.88E+16	1.46E+16
80	3.02E+16	2.64E+16	2.23E+16	1.84E+16	1.43E+16
82.5	2.97E+16	2.59E+16	2.19E+16	1.81E+16	1.40E+16
85	2.92E+16	2.55E+16	2.15E+16	1.77E+16	1.38E+16
87.5	2.90E+16	2.52E+16	2.13E+16	1.76E+16	1.36E+16
90	2.87E+16	2.50E+16	2.11E+16	1.75E+16	1.35E+16

Appendix Table B- 8 Fast Fluence at Locations in the Shroud for Weld H7 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	6.59E+13	5.56E+13	4.47E+13	3.56E+13	2.72E+13
2.5	6.57E+13	5.57E+13	4.47E+13	3.58E+13	2.73E+13
5	6.61E+13	5.59E+13	4.48E+13	3.60E+13	2.74E+13
7.5	6.79E+13	5.73E+13	4.59E+13	3.65E+13	2.79E+13
10	6.74E+13	5.67E+13	4.56E+13	3.65E+13	2.79E+13
12.5	6.81E+13	5.74E+13	4.62E+13	3.70E+13	2.83E+13
15	6.89E+13	5.83E+13	4.68E+13	3.73E+13	2.86E+13
17.5	7.08E+13	5.96E+13	4.78E+13	3.80E+13	2.90E+13
20	7.20E+13	6.06E+13	4.84E+13	3.86E+13	2.94E+13
22.5	7.29E+13	6.14E+13	4.94E+13	3.92E+13	2.99E+13
25	7.43E+13	6.25E+13	5.02E+13	3.99E+13	3.05E+13
27.5	7.58E+13	6.39E+13	5.11E+13	4.07E+13	3.11E+13
30	7.69E+13	6.47E+13	5.20E+13	4.13E+13	3.16E+13
32.5	7.89E+13	6.59E+13	5.29E+13	4.20E+13	3.20E+13
35	7.99E+13	6.67E+13	5.37E+13	4.26E+13	3.26E+13
37.5	8.03E+13	6.74E+13	5.42E+13	4.32E+13	3.30E+13
40	8.05E+13	6.77E+13	5.44E+13	4.36E+13	3.32E+13
42.5	8.18E+13	6.87E+13	5.50E+13	4.38E+13	3.35E+13
45	8.11E+13	6.80E+13	5.48E+13	4.34E+13	3.32E+13
47.5	8.09E+13	6.79E+13	5.46E+13	4.35E+13	3.32E+13
50	8.06E+13	6.79E+13	5.45E+13	4.32E+13	3.30E+13
52.5	8.04E+13	6.76E+13	5.42E+13	4.31E+13	3.29E+13
55	7.98E+13	6.71E+13	5.37E+13	4.27E+13	3.26E+13
57.5	8.02E+13	6.68E+13	5.37E+13	4.24E+13	3.24E+13
60	7.80E+13	6.53E+13	5.26E+13	4.17E+13	3.19E+13
62.5	7.65E+13	6.43E+13	5.17E+13	4.13E+13	3.15E+13
65	7.46E+13	6.30E+13	5.06E+13	4.04E+13	3.09E+13
67.5	7.35E+13	6.19E+13	4.98E+13	3.96E+13	3.03E+13
70	7.24E+13	6.07E+13	4.87E+13	3.88E+13	2.96E+13
72.5	7.10E+13	5.98E+13	4.79E+13	3.83E+13	2.91E+13
75	6.99E+13	5.90E+13	4.73E+13	3.76E+13	2.87E+13
77.5	6.87E+13	5.81E+13	4.66E+13	3.71E+13	2.82E+13
80	6.82E+13	5.74E+13	4.60E+13	3.65E+13	2.78E+13
82.5	6.74E+13	5.69E+13	4.56E+13	3.63E+13	2.76E+13
85	6.65E+13	5.63E+13	4.51E+13	3.59E+13	2.74E+13
87.5	6.63E+13	5.60E+13	4.49E+13	3.60E+13	2.74E+13
90	6.63E+13	5.60E+13	4.49E+13	3.58E+13	2.73E+13

Appendix Table B- 9 Fast Fluence at Locations in the Top Guide for Welds V1 and V3 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
194.73	2.79E+19	2.54E+19	2.28E+19	1.98E+19	9.39E+18
196.56	2.72E+19	2.09E+19	1.72E+19	1.34E+19	6.95E+18
198.39	2.53E+19	1.66E+19	1.18E+19	8.27E+18	4.52E+18
200.22	2.29E+19	1.40E+19	8.63E+18	5.50E+18	2.89E+18
202.05	2.08E+19	1.24E+19	7.12E+18	4.15E+18	2.03E+18
203.73	1.91E+19	1.12E+19	6.28E+18	3.48E+18	1.60E+18

Appendix Table B- 10 Fast Fluence at Locations in the Top Guide for Welds V2 and V4 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
194.73	2.80E+19	2.55E+19	2.30E+19	1.99E+19	9.45E+18
196.56	2.74E+19	2.10E+19	1.73E+19	1.35E+19	7.00E+18
198.39	2.55E+19	1.66E+19	1.18E+19	8.31E+18	4.55E+18
200.22	2.30E+19	1.40E+19	8.68E+18	5.53E+18	2.91E+18
202.05	2.09E+19	1.25E+19	7.16E+18	4.18E+18	2.04E+18
203.73	1.92E+19	1.12E+19	6.31E+18	3.50E+18	1.62E+18

Appendix Table B- 11 Fast Fluence at Locations in the Top Guide for Weld V5 and V6 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
162.19	8.95E+18	7.94E+18	6.64E+18	5.28E+18	3.87E+18
164.19	1.30E+19	1.16E+19	9.60E+18	7.51E+18	5.43E+18
166.19	1.81E+19	1.65E+19	1.37E+19	1.07E+19	7.75E+18
168.19	2.10E+19	1.93E+19	1.61E+19	1.27E+19	9.21E+18
170.19	2.46E+19	2.26E+19	1.87E+19	1.46E+19	1.06E+19
172.19	2.74E+19	2.52E+19	2.11E+19	1.65E+19	1.20E+19
174.19	2.89E+19	2.78E+19	2.39E+19	1.87E+19	1.35E+19
176.19	3.00E+19	2.93E+19	2.58E+19	2.03E+19	1.47E+19
178.19	3.05E+19	2.96E+19	2.59E+19	2.05E+19	1.50E+19
180.19	3.03E+19	2.94E+19	2.57E+19	2.03E+19	1.48E+19
182.19	2.99E+19	2.90E+19	2.52E+19	1.98E+19	1.44E+19
184.19	2.92E+19	2.84E+19	2.46E+19	1.92E+19	1.39E+19
186.19	2.83E+19	2.75E+19	2.36E+19	1.84E+19	1.34E+19
188.19	2.71E+19	2.64E+19	2.26E+19	1.76E+19	1.27E+19
190.19	2.59E+19	2.52E+19	2.15E+19	1.66E+19	1.20E+19
192.19	2.46E+19	2.40E+19	2.04E+19	1.57E+19	1.13E+19
194.73	2.10E+19	1.97E+19	1.67E+19	1.30E+19	9.40E+18

Appendix Table B- 12 Fast Fluence at Locations in the Top Guide for Welds V7 and V8 vs. Radial Location.

Location in Shroud	Height above BAF (inches)				
	157.82	158.91	160.00	161.10	162.19
Radial Location (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
0	3.32E+21	2.81E+21	2.38E+21	2.01E+21	1.68E+21
4	3.34E+21	2.82E+21	2.39E+21	2.02E+21	1.68E+21
8	3.36E+21	2.84E+21	2.40E+21	2.02E+21	1.69E+21
12	3.36E+21	2.84E+21	2.40E+21	2.03E+21	1.69E+21
16	3.36E+21	2.84E+21	2.40E+21	2.02E+21	1.68E+21
20	3.35E+21	2.83E+21	2.40E+21	2.02E+21	1.68E+21
24	3.34E+21	2.82E+21	2.39E+21	2.01E+21	1.67E+21
28	3.32E+21	2.80E+21	2.37E+21	1.99E+21	1.66E+21
32	3.28E+21	2.77E+21	2.34E+21	1.97E+21	1.64E+21
36	3.23E+21	2.73E+21	2.31E+21	1.94E+21	1.61E+21
40	3.18E+21	2.68E+21	2.27E+21	1.90E+21	1.58E+21
44	3.11E+21	2.62E+21	2.22E+21	1.86E+21	1.55E+21
48	3.03E+21	2.55E+21	2.16E+21	1.81E+21	1.51E+21
52	2.93E+21	2.47E+21	2.09E+21	1.75E+21	1.46E+21
56	2.82E+21	2.38E+21	2.00E+21	1.69E+21	1.40E+21
60	2.69E+21	2.27E+21	1.91E+21	1.61E+21	1.34E+21
64	2.54E+21	2.14E+21	1.80E+21	1.52E+21	1.26E+21
68	2.37E+21	2.00E+21	1.68E+21	1.41E+21	1.18E+21
72	2.19E+21	1.83E+21	1.54E+21	1.29E+21	1.07E+21
76	1.95E+21	1.64E+21	1.38E+21	1.16E+21	9.63E+20
80	1.68E+21	1.41E+21	1.19E+21	1.01E+21	8.37E+20
84	1.39E+21	1.17E+21	9.84E+20	8.27E+20	6.88E+20
88	1.06E+21	9.01E+20	7.65E+20	6.49E+20	5.43E+20
92	7.65E+20	6.54E+20	5.62E+20	4.82E+20	4.07E+20
96	4.77E+20	4.49E+20	3.95E+20	3.36E+20	2.73E+20
100	1.36E+20	1.26E+20	1.04E+20	8.37E+19	6.54E+19
104	4.62E+19	4.18E+19	3.41E+19	2.81E+19	2.45E+19
108	1.56E+19	1.37E+19	1.21E+19	1.11E+19	1.15E+19
112.17	2.66E+18	2.57E+18	2.62E+18	3.06E+18	3.89E+18

Appendix Table B- 13 Fast Fluence at Locations in the Top Guide for Welds V9 and V11 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
151.94	6.47E+19	5.35E+19	3.62E+19	2.31E+19	1.53E+19
153.75	5.26E+19	4.25E+19	3.06E+19	2.09E+19	1.25E+19
155.57	4.25E+19	3.46E+19	2.51E+19	1.72E+19	1.03E+19
157.38	3.63E+19	2.86E+19	2.06E+19	1.42E+19	8.89E+18
159.19	2.77E+19	2.15E+19	1.61E+19	1.17E+19	8.36E+18

Appendix Table B- 14 Fast Fluence at Locations in the Top Guide for Welds V10 and V12 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
151.94	6.51E+19	5.38E+19	3.65E+19	2.33E+19	1.54E+19
153.75	5.29E+19	4.29E+19	3.08E+19	2.10E+19	1.26E+19
155.57	4.27E+19	3.48E+19	2.52E+19	1.72E+19	1.03E+19
157.38	3.65E+19	2.88E+19	2.06E+19	1.43E+19	8.93E+18
159.19	2.78E+19	2.16E+19	1.62E+19	1.18E+19	8.39E+18

Appendix Table B- 15 Fast Fluence at Locations in the Shroud for Weld V13 and V14 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
99.19	3.80E+20	3.44E+20	2.86E+20	2.26E+20	1.65E+20
102.00	3.81E+20	3.44E+20	2.87E+20	2.27E+20	1.65E+20
105.00	3.80E+20	3.44E+20	2.86E+20	2.26E+20	1.65E+20
108.00	3.79E+20	3.43E+20	2.86E+20	2.26E+20	1.65E+20
111.00	3.78E+20	3.42E+20	2.84E+20	2.25E+20	1.64E+20
114.00	3.75E+20	3.39E+20	2.82E+20	2.23E+20	1.63E+20
117.00	3.71E+20	3.36E+20	2.79E+20	2.21E+20	1.61E+20
120.00	3.65E+20	3.29E+20	2.74E+20	2.17E+20	1.58E+20
123.00	3.55E+20	3.20E+20	2.67E+20	2.11E+20	1.54E+20
126.00	3.40E+20	3.07E+20	2.56E+20	2.02E+20	1.47E+20
129.00	3.20E+20	2.89E+20	2.41E+20	1.90E+20	1.39E+20
132.00	2.94E+20	2.66E+20	2.21E+20	1.75E+20	1.27E+20
135.00	2.62E+20	2.37E+20	1.97E+20	1.55E+20	1.13E+20
138.00	2.24E+20	2.02E+20	1.68E+20	1.33E+20	9.71E+19
141.00	1.84E+20	1.66E+20	1.38E+20	1.09E+20	7.98E+19
144.00	1.43E+20	1.29E+20	1.07E+20	8.50E+19	6.21E+19
147.00	1.04E+20	9.47E+19	7.90E+19	6.27E+19	4.59E+19
150.00	7.32E+19	6.67E+19	5.59E+19	4.46E+19	3.29E+19
151.94	5.97E+19	5.40E+19	4.57E+19	3.73E+19	2.91E+19

Appendix Table B- 16 Fast Fluence at Locations in the Shroud for Weld V15 and V16 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
9.42	1.52E+20	1.37E+20	1.14E+20	9.00E+19	6.57E+19
12.00	1.70E+20	1.54E+20	1.28E+20	1.01E+20	7.38E+19
15.00	1.88E+20	1.70E+20	1.41E+20	1.12E+20	8.17E+19
18.00	2.02E+20	1.82E+20	1.52E+20	1.20E+20	8.78E+19
21.00	2.13E+20	1.93E+20	1.61E+20	1.27E+20	9.29E+19
24.00	2.23E+20	2.01E+20	1.68E+20	1.33E+20	9.71E+19
27.00	2.31E+20	2.09E+20	1.74E+20	1.38E+20	1.01E+20
30.00	2.40E+20	2.17E+20	1.81E+20	1.43E+20	1.05E+20
33.00	2.48E+20	2.25E+20	1.87E+20	1.48E+20	1.08E+20
36.00	2.56E+20	2.32E+20	1.93E+20	1.53E+20	1.12E+20
39.00	2.65E+20	2.39E+20	1.99E+20	1.58E+20	1.15E+20
42.00	2.72E+20	2.47E+20	2.05E+20	1.63E+20	1.19E+20
45.00	2.80E+20	2.53E+20	2.11E+20	1.67E+20	1.22E+20
48.00	2.87E+20	2.60E+20	2.17E+20	1.71E+20	1.25E+20
51.00	2.95E+20	2.67E+20	2.22E+20	1.76E+20	1.29E+20
54.00	3.02E+20	2.73E+20	2.27E+20	1.80E+20	1.32E+20
57.00	3.09E+20	2.79E+20	2.33E+20	1.84E+20	1.35E+20
60.00	3.16E+20	2.86E+20	2.38E+20	1.88E+20	1.38E+20
63.00	3.23E+20	2.92E+20	2.43E+20	1.92E+20	1.41E+20
66.00	3.30E+20	2.98E+20	2.48E+20	1.96E+20	1.44E+20
69.00	3.36E+20	3.04E+20	2.53E+20	2.00E+20	1.47E+20
72.00	3.43E+20	3.10E+20	2.58E+20	2.04E+20	1.49E+20
75.00	3.49E+20	3.16E+20	2.63E+20	2.08E+20	1.52E+20
78.00	3.56E+20	3.22E+20	2.68E+20	2.12E+20	1.55E+20
81.00	3.61E+20	3.27E+20	2.72E+20	2.15E+20	1.57E+20
84.00	3.66E+20	3.31E+20	2.76E+20	2.18E+20	1.59E+20
87.00	3.71E+20	3.35E+20	2.79E+20	2.21E+20	1.61E+20
90.00	3.74E+20	3.38E+20	2.82E+20	2.23E+20	1.63E+20
93.00	3.77E+20	3.41E+20	2.84E+20	2.24E+20	1.64E+20
96.00	3.79E+20	3.43E+20	2.85E+20	2.25E+20	1.65E+20
99.19	3.80E+20	3.44E+20	2.86E+20	2.26E+20	1.65E+20

Appendix Table B- 17 Fast Fluence at Locations in the Shroud for Welds V17 and V18 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
-24.93	1.63E+17	1.46E+17	1.24E+17	1.02E+17	7.90E+16
-23.31	2.24E+17	2.09E+17	1.80E+17	1.49E+17	1.16E+17
-21.31	3.69E+17	3.43E+17	2.95E+17	2.45E+17	1.93E+17
-19.31	6.17E+17	5.75E+17	4.97E+17	4.14E+17	3.25E+17
-17.31	1.05E+18	9.82E+17	8.52E+17	7.14E+17	5.62E+17
-15.31	1.82E+18	1.72E+18	1.50E+18	1.27E+18	9.98E+17
-13.31	3.27E+18	3.12E+18	2.76E+18	2.32E+18	1.82E+18
-11.31	6.14E+18	5.92E+18	5.21E+18	4.33E+18	3.33E+18
-9.31	1.19E+19	1.09E+19	9.23E+18	7.47E+18	5.63E+18
-7.31	1.75E+19	1.64E+19	1.39E+19	1.13E+19	8.46E+18
-5.31	2.56E+19	2.39E+19	2.04E+19	1.65E+19	1.23E+19
-3.31	3.68E+19	3.43E+19	2.91E+19	2.35E+19	1.75E+19
-1.31	5.27E+19	4.89E+19	4.14E+19	3.32E+19	2.46E+19
0.69	6.98E+19	6.45E+19	5.43E+19	4.35E+19	3.22E+19
2.69	8.96E+19	8.26E+19	6.94E+19	5.54E+19	4.08E+19
4.69	1.10E+20	1.02E+20	8.53E+19	6.80E+19	5.01E+19
6.69	1.28E+20	1.18E+20	9.91E+19	7.90E+19	5.82E+19
8.69	1.47E+20	1.35E+20	1.13E+20	9.01E+19	6.64E+19
9.42	1.53E+20	1.41E+20	1.18E+20	9.42E+19	6.94E+19

Appendix Table B- 18 Fast Fluence at Locations in the Shroud for Welds V19 and V21 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
-33.87	4.91E+16	3.23E+16	2.30E+16	1.38E+16	7.45E+15
-31.87	8.44E+16	5.87E+16	3.92E+16	2.52E+16	1.33E+16
-29.87	1.35E+17	9.61E+16	6.50E+16	4.18E+16	2.22E+16
-27.87	2.15E+17	1.57E+17	1.06E+17	6.84E+16	3.65E+16
-25.87	3.42E+17	2.58E+17	1.68E+17	1.12E+17	5.96E+16
-24.93	4.18E+17	3.21E+17	2.03E+17	1.39E+17	7.46E+16

Appendix Table B- 19 Fast Fluence at Locations in the Shroud for Welds V20 and V22 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
-33.87	4.92E+16	3.25E+16	2.32E+16	1.40E+16	7.52E+15
-31.87	8.50E+16	5.92E+16	3.96E+16	2.54E+16	1.35E+16
-29.87	1.37E+17	9.74E+16	6.58E+16	4.23E+16	2.25E+16
-27.87	2.17E+17	1.59E+17	1.08E+17	6.91E+16	3.70E+16
-25.87	3.49E+17	2.61E+17	1.71E+17	1.13E+17	6.04E+16
-24.93	4.24E+17	3.26E+17	2.06E+17	1.41E+17	7.57E+16

Appendix Table B- 20 Fast Fluence at Locations in the Shroud for Welds V23 and V24 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 35 EFPY n/cm^2				
-65.81	6.61E+13	5.59E+13	4.48E+13	3.60E+13	2.74E+13
-63.87	9.52E+13	7.99E+13	6.48E+13	5.08E+13	3.76E+13
-61.87	1.41E+14	1.20E+14	9.60E+13	7.59E+13	5.56E+13
-59.87	2.07E+14	1.76E+14	1.41E+14	1.11E+14	8.12E+13
-57.87	3.03E+14	2.59E+14	2.07E+14	1.62E+14	1.19E+14
-55.87	4.50E+14	3.79E+14	3.05E+14	2.40E+14	1.74E+14
-53.87	6.65E+14	5.67E+14	4.53E+14	3.54E+14	2.57E+14
-51.87	9.89E+14	8.40E+14	6.71E+14	5.23E+14	3.79E+14
-49.87	1.46E+15	1.23E+15	9.85E+14	7.68E+14	5.56E+14
-47.87	2.14E+15	1.81E+15	1.44E+15	1.12E+15	8.11E+14
-45.87	3.09E+15	2.61E+15	2.10E+15	1.63E+15	1.18E+15
-43.87	4.62E+15	3.93E+15	3.13E+15	2.43E+15	1.73E+15
-41.87	6.78E+15	5.79E+15	4.58E+15	3.52E+15	2.51E+15
-39.87	9.80E+15	8.39E+15	6.62E+15	5.06E+15	3.60E+15
-37.87	1.43E+16	1.21E+16	9.52E+15	7.32E+15	5.18E+15
-35.87	1.96E+16	1.66E+16	1.34E+16	1.07E+16	7.68E+15
-33.87	2.90E+16	2.53E+16	2.14E+16	1.77E+16	1.37E+16

C
SHROUD/TOP GUIDE WELD FLUENCE RESULTS AFTER 54 EFPY EXPOSURE

This appendix contains calculated fast fluence values (fluence for neutrons with energy above 1 MeV) for welds in the shroud and top guide. Fluence values for each weld are given at the IR, OR, and at positions 1/4, 1/2, and 3/4 of the distance between the IR and OR for an exposure of 54 EFPY (25.912 EFPY beyond the calculated end of cycle 21). Values are tabulated versus azimuthal angle for horizontal welds, and versus height above BAF for vertical welds.

Welds V7 and V8 in the top guide extend from 0 radius to the outside of the guide assembly. For these welds, fluence values are given as a function of radius for 5 axial heights.

As discussed in Section 4, scallops are cut in the outside of the shroud at angles of approximately 18, 33.5, 44.5, 59, 69, and 84.5 degrees. These scallops affect welds H5 and H6A and reduce the outside radius of the shroud at angles near these values. The extent of the region of removed material is between 1.5 and 2 degrees for weld H5 and between 2 and 3 degrees for weld H6A. Thus, the angles in the tabulated fluence data that are affected include 17.5, 32.5, 45, 60, 67.5, 70, and 85 degrees and, to a lesser extent, 35 degrees, for weld H5. For weld H6A, these same angles are affected with possibly some effect at neighboring angles. The depth of the scallops is sufficient that at weld H6A, material may be removed below the 3/4T position. The tables do not reflect any change in shroud OR and thus the fluence at the affected angles is tabulated for locations that are actually outside the shroud.

Appendix Table C- 1 Fast Fluence at Locations in the Top Guide for Weld H1 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	3.89E+19	3.51E+19	2.96E+19	2.36E+19	1.80E+19
2.5	3.89E+19	3.51E+19	2.95E+19	2.36E+19	1.80E+19
5	3.89E+19	3.51E+19	2.96E+19	2.36E+19	1.80E+19
7.5	3.89E+19	3.52E+19	2.96E+19	2.37E+19	1.80E+19
10	3.92E+19	3.54E+19	2.98E+19	2.38E+19	1.81E+19
12.5	3.93E+19	3.55E+19	2.99E+19	2.39E+19	1.82E+19
15	3.95E+19	3.57E+19	3.00E+19	2.40E+19	1.83E+19
17.5	3.98E+19	3.59E+19	3.02E+19	2.41E+19	1.84E+19
20	4.01E+19	3.62E+19	3.04E+19	2.43E+19	1.85E+19
22.5	4.04E+19	3.64E+19	3.06E+19	2.44E+19	1.86E+19
25	4.08E+19	3.67E+19	3.08E+19	2.46E+19	1.87E+19
27.5	4.10E+19	3.70E+19	3.10E+19	2.48E+19	1.88E+19
30	4.14E+19	3.73E+19	3.13E+19	2.49E+19	1.90E+19
32.5	4.17E+19	3.76E+19	3.15E+19	2.51E+19	1.91E+19
35	4.19E+19	3.77E+19	3.16E+19	2.52E+19	1.92E+19
37.5	4.21E+19	3.79E+19	3.18E+19	2.53E+19	1.93E+19
40	4.24E+19	3.81E+19	3.19E+19	2.55E+19	1.94E+19
42.5	4.24E+19	3.82E+19	3.20E+19	2.55E+19	1.94E+19
45	4.25E+19	3.82E+19	3.20E+19	2.55E+19	1.94E+19
47.5	4.25E+19	3.82E+19	3.20E+19	2.55E+19	1.94E+19
50	4.24E+19	3.81E+19	3.19E+19	2.55E+19	1.94E+19
52.5	4.22E+19	3.79E+19	3.18E+19	2.54E+19	1.93E+19
55	4.19E+19	3.78E+19	3.17E+19	2.53E+19	1.92E+19
57.5	4.18E+19	3.76E+19	3.15E+19	2.51E+19	1.91E+19
60	4.14E+19	3.73E+19	3.13E+19	2.50E+19	1.90E+19
62.5	4.11E+19	3.70E+19	3.11E+19	2.48E+19	1.89E+19
65	4.09E+19	3.68E+19	3.09E+19	2.47E+19	1.88E+19
67.5	4.05E+19	3.65E+19	3.07E+19	2.45E+19	1.87E+19
70	4.02E+19	3.63E+19	3.05E+19	2.43E+19	1.85E+19
72.5	3.99E+19	3.60E+19	3.03E+19	2.42E+19	1.84E+19
75	3.97E+19	3.58E+19	3.01E+19	2.41E+19	1.83E+19
77.5	3.95E+19	3.57E+19	3.00E+19	2.40E+19	1.83E+19
80	3.93E+19	3.56E+19	2.99E+19	2.39E+19	1.82E+19
82.5	3.92E+19	3.54E+19	2.98E+19	2.38E+19	1.81E+19
85	3.90E+19	3.52E+19	2.96E+19	2.37E+19	1.80E+19
87.5	3.90E+19	3.52E+19	2.96E+19	2.37E+19	1.81E+19
90	3.90E+19	3.52E+19	2.96E+19	2.37E+19	1.81E+19

Appendix Table C- 2 Fast Fluence at Locations in the Top Guide for Weld H2 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	1.72E+19	1.52E+19	1.27E+19	1.01E+19	7.43E+18
2.5	1.71E+19	1.52E+19	1.27E+19	1.01E+19	7.39E+18
5	1.68E+19	1.49E+19	1.24E+19	9.88E+18	7.25E+18
7.5	1.62E+19	1.45E+19	1.21E+19	9.62E+18	7.06E+18
10	1.59E+19	1.41E+19	1.18E+19	9.41E+18	6.92E+18
12.5	1.59E+19	1.41E+19	1.18E+19	9.41E+18	6.91E+18
15	1.63E+19	1.45E+19	1.21E+19	9.65E+18	7.09E+18
17.5	1.71E+19	1.52E+19	1.27E+19	1.01E+19	7.40E+18
20	1.81E+19	1.60E+19	1.34E+19	1.06E+19	7.80E+18
22.5	1.89E+19	1.67E+19	1.40E+19	1.11E+19	8.15E+18
25	1.92E+19	1.70E+19	1.42E+19	1.12E+19	8.25E+18
27.5	1.89E+19	1.67E+19	1.40E+19	1.11E+19	8.17E+18
30	1.87E+19	1.66E+19	1.39E+19	1.10E+19	8.10E+18
32.5	1.92E+19	1.70E+19	1.42E+19	1.13E+19	8.32E+18
35	2.08E+19	1.84E+19	1.54E+19	1.22E+19	8.98E+18
37.5	2.34E+19	2.06E+19	1.72E+19	1.36E+19	1.00E+19
40	2.57E+19	2.25E+19	1.88E+19	1.49E+19	1.09E+19
42.5	2.67E+19	2.34E+19	1.95E+19	1.55E+19	1.14E+19
45	2.70E+19	2.36E+19	1.97E+19	1.56E+19	1.14E+19
47.5	2.67E+19	2.34E+19	1.95E+19	1.55E+19	1.13E+19
50	2.58E+19	2.25E+19	1.88E+19	1.49E+19	1.09E+19
52.5	2.34E+19	2.06E+19	1.72E+19	1.36E+19	1.00E+19
55	2.08E+19	1.84E+19	1.54E+19	1.22E+19	8.98E+18
57.5	1.92E+19	1.70E+19	1.43E+19	1.13E+19	8.33E+18
60	1.87E+19	1.66E+19	1.39E+19	1.10E+19	8.11E+18
62.5	1.89E+19	1.68E+19	1.40E+19	1.11E+19	8.18E+18
65	1.92E+19	1.70E+19	1.42E+19	1.13E+19	8.27E+18
67.5	1.90E+19	1.68E+19	1.40E+19	1.11E+19	8.17E+18
70	1.81E+19	1.61E+19	1.34E+19	1.07E+19	7.84E+18
72.5	1.72E+19	1.52E+19	1.27E+19	1.01E+19	7.44E+18
75	1.64E+19	1.46E+19	1.22E+19	9.69E+18	7.12E+18
77.5	1.59E+19	1.42E+19	1.19E+19	9.45E+18	6.94E+18
80	1.59E+19	1.42E+19	1.19E+19	9.45E+18	6.94E+18
82.5	1.63E+19	1.45E+19	1.21E+19	9.65E+18	7.08E+18
85	1.68E+19	1.49E+19	1.25E+19	9.92E+18	7.28E+18
87.5	1.71E+19	1.52E+19	1.27E+19	1.01E+19	7.42E+18
90	1.72E+19	1.53E+19	1.28E+19	1.02E+19	7.46E+18

Appendix Table C- 3 Fast Fluence at Locations in the Shroud for Weld H3 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	1.27E+20	1.05E+20	7.12E+19	4.55E+19	3.00E+19
2.5	1.24E+20	1.02E+20	6.93E+19	4.42E+19	2.92E+19
5	1.16E+20	9.58E+19	6.47E+19	4.12E+19	2.72E+19
7.5	9.96E+19	8.24E+19	5.59E+19	3.58E+19	2.38E+19
10	8.43E+19	7.03E+19	4.80E+19	3.11E+19	2.09E+19
12.5	8.22E+19	6.85E+19	4.68E+19	3.03E+19	2.04E+19
15	9.22E+19	7.67E+19	5.23E+19	3.38E+19	2.26E+19
17.5	1.12E+20	9.33E+19	6.35E+19	4.08E+19	2.72E+19
20	1.42E+20	1.17E+20	7.94E+19	5.07E+19	3.35E+19
22.5	1.68E+20	1.38E+20	9.34E+19	5.93E+19	3.89E+19
25	1.72E+20	1.42E+20	9.57E+19	6.07E+19	3.98E+19
27.5	1.54E+20	1.28E+20	8.71E+19	5.58E+19	3.70E+19
30	1.39E+20	1.16E+20	7.89E+19	5.10E+19	3.41E+19
32.5	1.47E+20	1.22E+20	8.35E+19	5.41E+19	3.64E+19
35	1.91E+20	1.59E+20	1.09E+20	7.00E+19	4.68E+19
37.5	2.83E+20	2.32E+20	1.56E+20	9.91E+19	6.50E+19
40	3.74E+20	3.02E+20	2.01E+20	1.26E+20	8.18E+19
42.5	3.86E+20	3.17E+20	2.14E+20	1.35E+20	8.83E+19
45	3.97E+20	3.24E+20	2.18E+20	1.37E+20	8.98E+19
47.5	3.86E+20	3.18E+20	2.14E+20	1.35E+20	8.82E+19
50	3.76E+20	3.03E+20	2.02E+20	1.27E+20	8.22E+19
52.5	2.82E+20	2.32E+20	1.57E+20	9.93E+19	6.52E+19
55	1.91E+20	1.59E+20	1.08E+20	6.98E+19	4.66E+19
57.5	1.47E+20	1.23E+20	8.34E+19	5.41E+19	3.64E+19
60	1.39E+20	1.16E+20	7.90E+19	5.10E+19	3.41E+19
62.5	1.55E+20	1.28E+20	8.73E+19	5.59E+19	3.71E+19
65	1.72E+20	1.42E+20	9.57E+19	6.07E+19	3.99E+19
67.5	1.69E+20	1.39E+20	9.39E+19	5.96E+19	3.91E+19
70	1.43E+20	1.18E+20	8.01E+19	5.11E+19	3.38E+19
72.5	1.13E+20	9.42E+19	6.42E+19	4.13E+19	2.75E+19
75	9.31E+19	7.74E+19	5.29E+19	3.41E+19	2.28E+19
77.5	8.29E+19	6.90E+19	4.72E+19	3.05E+19	2.05E+19
80	8.46E+19	7.04E+19	4.82E+19	3.12E+19	2.09E+19
82.5	9.96E+19	8.26E+19	5.61E+19	3.60E+19	2.39E+19
85	1.17E+20	9.69E+19	6.55E+19	4.17E+19	2.75E+19
87.5	1.25E+20	1.03E+20	6.99E+19	4.46E+19	2.94E+19
90	1.28E+20	1.06E+20	7.18E+19	4.58E+19	3.02E+19

Appendix Table C- 4 Fast Fluence at Locations in the Shroud for Weld H4 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	7.21E+20	6.53E+20	5.45E+20	4.31E+20	3.15E+20
2.5	7.03E+20	6.36E+20	5.30E+20	4.19E+20	3.06E+20
5	6.57E+20	5.94E+20	4.94E+20	3.91E+20	2.85E+20
7.5	5.57E+20	5.04E+20	4.20E+20	3.33E+20	2.44E+20
10	4.60E+20	4.19E+20	3.51E+20	2.80E+20	2.06E+20
12.5	4.49E+20	4.09E+20	3.43E+20	2.74E+20	2.02E+20
15	5.17E+20	4.70E+20	3.94E+20	3.14E+20	2.31E+20
17.5	6.52E+20	5.93E+20	4.97E+20	3.95E+20	2.89E+20
20	8.64E+20	7.83E+20	6.52E+20	5.16E+20	3.77E+20
22.5	1.06E+21	9.59E+20	7.96E+20	6.28E+20	4.57E+20
25	1.11E+21	9.98E+20	8.29E+20	6.55E+20	4.78E+20
27.5	9.68E+20	8.78E+20	7.34E+20	5.84E+20	4.29E+20
30	8.51E+20	7.74E+20	6.48E+20	5.15E+20	3.79E+20
32.5	8.97E+20	8.15E+20	6.85E+20	5.44E+20	4.01E+20
35	1.22E+21	1.11E+21	9.30E+20	7.39E+20	5.42E+20
37.5	1.94E+21	1.75E+21	1.45E+21	1.14E+21	8.28E+20
40	2.68E+21	2.39E+21	1.96E+21	1.53E+21	1.10E+21
42.5	2.80E+21	2.52E+21	2.08E+21	1.64E+21	1.19E+21
45	2.91E+21	2.61E+21	2.15E+21	1.69E+21	1.22E+21
47.5	2.80E+21	2.53E+21	2.09E+21	1.65E+21	1.19E+21
50	2.72E+21	2.42E+21	1.99E+21	1.56E+21	1.12E+21
52.5	1.95E+21	1.76E+21	1.46E+21	1.15E+21	8.43E+20
55	1.23E+21	1.12E+21	9.38E+20	7.44E+20	5.46E+20
57.5	9.07E+20	8.28E+20	6.86E+20	5.46E+20	4.05E+20
60	8.60E+20	7.82E+20	6.53E+20	5.21E+20	3.83E+20
62.5	9.81E+20	8.90E+20	7.43E+20	5.89E+20	4.31E+20
65	1.12E+21	1.01E+21	8.35E+20	6.58E+20	4.79E+20
67.5	1.07E+21	9.70E+20	8.06E+20	6.36E+20	4.63E+20
70	8.77E+20	7.95E+20	6.63E+20	5.25E+20	3.84E+20
72.5	6.67E+20	6.06E+20	5.07E+20	4.03E+20	2.96E+20
75	5.29E+20	4.81E+20	4.04E+20	3.21E+20	2.37E+20
77.5	4.62E+20	4.19E+20	3.52E+20	2.82E+20	2.09E+20
80	4.71E+20	4.29E+20	3.59E+20	2.86E+20	2.11E+20
82.5	5.70E+20	5.16E+20	4.31E+20	3.42E+20	2.51E+20
85	6.77E+20	6.13E+20	5.12E+20	4.05E+20	2.96E+20
87.5	7.22E+20	6.55E+20	5.46E+20	4.33E+20	3.16E+20
90	7.40E+20	6.71E+20	5.61E+20	4.44E+20	3.25E+20

Appendix Table C- 5 Fast Fluence at Locations in the Shroud for Weld H5 vs. Azimuth[a].

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	3.15E+20	2.84E+20	2.37E+20	1.87E+20	1.36E+20
2.5	3.04E+20	2.74E+20	2.28E+20	1.80E+20	1.32E+20
5	2.81E+20	2.54E+20	2.11E+20	1.66E+20	1.21E+20
7.5	2.40E+20	2.16E+20	1.80E+20	1.43E+20	1.04E+20
10	2.00E+20	1.81E+20	1.52E+20	1.21E+20	8.89E+19
12.5	1.97E+20	1.79E+20	1.50E+20	1.19E+20	8.77E+19
15	2.25E+20	2.04E+20	1.71E+20	1.36E+20	1.00E+20
17.5	2.81E+20	2.55E+20	2.13E+20	1.69E+20	1.24E+20
20	3.70E+20	3.35E+20	2.78E+20	2.20E+20	1.60E+20
22.5	4.52E+20	4.07E+20	3.37E+20	2.66E+20	1.93E+20
25	4.72E+20	4.25E+20	3.53E+20	2.79E+20	2.03E+20
27.5	4.22E+20	3.82E+20	3.19E+20	2.53E+20	1.86E+20
30	3.79E+20	3.44E+20	2.87E+20	2.29E+20	1.68E+20
32.5	4.03E+20	3.65E+20	3.06E+20	2.43E+20	1.78E+20
35	5.40E+20	4.90E+20	4.08E+20	3.24E+20	2.37E+20
37.5	8.36E+20	7.51E+20	6.21E+20	4.89E+20	3.54E+20
40	1.14E+21	1.02E+21	8.32E+20	6.50E+20	4.68E+20
42.5	1.21E+21	1.08E+21	8.95E+20	7.03E+20	5.07E+20
45	1.25E+21	1.12E+21	9.20E+20	7.20E+20	5.20E+20
47.5	1.21E+21	1.09E+21	8.97E+20	7.04E+20	5.09E+20
50	1.16E+21	1.03E+21	8.47E+20	6.62E+20	4.77E+20
52.5	8.40E+20	7.57E+20	6.28E+20	4.95E+20	3.61E+20
55	5.42E+20	4.92E+20	4.11E+20	3.26E+20	2.39E+20
57.5	4.05E+20	3.68E+20	3.05E+20	2.42E+20	1.79E+20
60	3.77E+20	3.42E+20	2.85E+20	2.27E+20	1.67E+20
62.5	4.18E+20	3.78E+20	3.15E+20	2.50E+20	1.82E+20
65	4.65E+20	4.18E+20	3.47E+20	2.73E+20	1.99E+20
67.5	4.46E+20	4.02E+20	3.34E+20	2.63E+20	1.91E+20
70	3.68E+20	3.33E+20	2.78E+20	2.20E+20	1.60E+20
72.5	2.83E+20	2.57E+20	2.15E+20	1.70E+20	1.25E+20
75	2.28E+20	2.07E+20	1.74E+20	1.38E+20	1.02E+20
77.5	2.01E+20	1.82E+20	1.53E+20	1.22E+20	9.06E+19
80	2.04E+20	1.85E+20	1.55E+20	1.23E+20	9.08E+19
82.5	2.43E+20	2.20E+20	1.84E+20	1.45E+20	1.07E+20
85	2.86E+20	2.58E+20	2.16E+20	1.70E+20	1.24E+20
87.5	3.07E+20	2.78E+20	2.31E+20	1.83E+20	1.34E+20
90	3.17E+20	2.87E+20	2.39E+20	1.89E+20	1.38E+20

[a] This table reports fluences for the full thickness shroud. These data must be interpolated at the jet pump scallops to obtain the OR fluence (see text for discussion).

Appendix Table C- 6 Fast Fluence at Locations in the Shroud for Weld H6A vs. Azimuth[a].

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	3.10E+17	2.78E+17	2.36E+17	1.95E+17	1.52E+17
2.5	3.13E+17	2.80E+17	2.38E+17	1.97E+17	1.53E+17
5	3.17E+17	2.83E+17	2.40E+17	1.98E+17	1.54E+17
7.5	3.19E+17	2.85E+17	2.42E+17	1.99E+17	1.55E+17
10	3.24E+17	2.89E+17	2.46E+17	2.02E+17	1.56E+17
12.5	3.32E+17	2.95E+17	2.51E+17	2.06E+17	1.60E+17
15	3.41E+17	3.04E+17	2.59E+17	2.13E+17	1.65E+17
17.5	3.50E+17	3.13E+17	2.66E+17	2.20E+17	1.71E+17
20	3.60E+17	3.23E+17	2.76E+17	2.28E+17	1.78E+17
22.5	3.73E+17	3.35E+17	2.86E+17	2.37E+17	1.85E+17
25	3.88E+17	3.48E+17	2.97E+17	2.47E+17	1.93E+17
27.5	4.03E+17	3.62E+17	3.09E+17	2.57E+17	2.01E+17
30	4.20E+17	3.77E+17	3.21E+17	2.66E+17	2.08E+17
32.5	4.34E+17	3.88E+17	3.32E+17	2.75E+17	2.16E+17
35	4.44E+17	3.99E+17	3.42E+17	2.84E+17	2.23E+17
37.5	4.59E+17	4.13E+17	3.54E+17	2.95E+17	2.32E+17
40	4.73E+17	4.26E+17	3.66E+17	3.05E+17	2.41E+17
42.5	4.89E+17	4.40E+17	3.79E+17	3.16E+17	2.50E+17
45	4.91E+17	4.45E+17	3.83E+17	3.20E+17	2.54E+17
47.5	4.89E+17	4.41E+17	3.80E+17	3.18E+17	2.52E+17
50	4.77E+17	4.29E+17	3.70E+17	3.09E+17	2.45E+17
52.5	4.62E+17	4.17E+17	3.59E+17	3.00E+17	2.37E+17
55	4.47E+17	4.03E+17	3.45E+17	2.87E+17	2.26E+17
57.5	4.36E+17	3.91E+17	3.33E+17	2.77E+17	2.16E+17
60	4.18E+17	3.75E+17	3.20E+17	2.65E+17	2.07E+17
62.5	4.03E+17	3.60E+17	3.08E+17	2.55E+17	1.99E+17
65	3.87E+17	3.47E+17	2.96E+17	2.45E+17	1.91E+17
67.5	3.73E+17	3.34E+17	2.85E+17	2.36E+17	1.84E+17
70	3.60E+17	3.24E+17	2.76E+17	2.28E+17	1.78E+17
72.5	3.53E+17	3.15E+17	2.68E+17	2.21E+17	1.72E+17
75	3.43E+17	3.06E+17	2.61E+17	2.15E+17	1.67E+17
77.5	3.36E+17	3.00E+17	2.55E+17	2.10E+17	1.64E+17
80	3.28E+17	2.93E+17	2.49E+17	2.05E+17	1.59E+17
82.5	3.22E+17	2.88E+17	2.45E+17	2.02E+17	1.57E+17
85	3.18E+17	2.85E+17	2.42E+17	2.00E+17	1.56E+17
87.5	3.17E+17	2.83E+17	2.41E+17	1.99E+17	1.55E+17
90	3.14E+17	2.80E+17	2.39E+17	1.97E+17	1.54E+17

[a] This table reports fluences for the full thickness shroud. These data must be interpolated at the jet pump scallops to obtain the OR fluence (see text for discussion).

Appendix Table C- 7 Fast Fluence at Locations in the Shroud for Weld H6B vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	5.37E+16	4.70E+16	3.98E+16	3.30E+16	2.56E+16
2.5	5.43E+16	4.73E+16	4.00E+16	3.32E+16	2.57E+16
5	5.52E+16	4.82E+16	4.08E+16	3.37E+16	2.61E+16
7.5	5.62E+16	4.91E+16	4.15E+16	3.43E+16	2.66E+16
10	5.68E+16	4.98E+16	4.20E+16	3.49E+16	2.70E+16
12.5	5.82E+16	5.07E+16	4.29E+16	3.57E+16	2.76E+16
15	5.92E+16	5.17E+16	4.38E+16	3.63E+16	2.82E+16
17.5	6.02E+16	5.25E+16	4.44E+16	3.69E+16	2.86E+16
20	6.13E+16	5.37E+16	4.54E+16	3.77E+16	2.93E+16
22.5	6.30E+16	5.49E+16	4.67E+16	3.87E+16	3.01E+16
25	6.48E+16	5.68E+16	4.80E+16	3.99E+16	3.10E+16
27.5	6.70E+16	5.86E+16	4.95E+16	4.13E+16	3.21E+16
30	6.92E+16	6.03E+16	5.12E+16	4.24E+16	3.31E+16
32.5	7.07E+16	6.19E+16	5.25E+16	4.35E+16	3.39E+16
35	7.23E+16	6.32E+16	5.35E+16	4.46E+16	3.47E+16
37.5	7.33E+16	6.42E+16	5.45E+16	4.55E+16	3.55E+16
40	7.48E+16	6.56E+16	5.58E+16	4.66E+16	3.63E+16
42.5	7.63E+16	6.68E+16	5.68E+16	4.73E+16	3.70E+16
45	7.63E+16	6.68E+16	5.68E+16	4.75E+16	3.71E+16
47.5	7.61E+16	6.69E+16	5.69E+16	4.74E+16	3.70E+16
50	7.53E+16	6.61E+16	5.60E+16	4.67E+16	3.65E+16
52.5	7.40E+16	6.48E+16	5.51E+16	4.59E+16	3.58E+16
55	7.27E+16	6.37E+16	5.39E+16	4.49E+16	3.50E+16
57.5	7.11E+16	6.22E+16	5.28E+16	4.39E+16	3.42E+16
60	6.91E+16	6.04E+16	5.11E+16	4.24E+16	3.31E+16
62.5	6.70E+16	5.88E+16	4.97E+16	4.14E+16	3.22E+16
65	6.53E+16	5.70E+16	4.84E+16	4.02E+16	3.12E+16
67.5	6.33E+16	5.53E+16	4.69E+16	3.89E+16	3.02E+16
70	6.15E+16	5.37E+16	4.54E+16	3.77E+16	2.93E+16
72.5	6.02E+16	5.27E+16	4.46E+16	3.69E+16	2.87E+16
75	5.91E+16	5.18E+16	4.38E+16	3.62E+16	2.82E+16
77.5	5.83E+16	5.07E+16	4.29E+16	3.56E+16	2.77E+16
80	5.72E+16	5.00E+16	4.23E+16	3.51E+16	2.72E+16
82.5	5.64E+16	4.91E+16	4.15E+16	3.44E+16	2.67E+16
85	5.55E+16	4.84E+16	4.10E+16	3.37E+16	2.63E+16
87.5	5.50E+16	4.78E+16	4.04E+16	3.36E+16	2.60E+16
90	5.44E+16	4.74E+16	4.01E+16	3.33E+16	2.58E+16

Appendix Table C- 8 Fast Fluence at Locations in the Shroud for Weld H7 vs. Azimuth.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Theta (deg)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	1.23E+14	1.04E+14	8.32E+13	6.61E+13	5.06E+13
2.5	1.22E+14	1.04E+14	8.31E+13	6.66E+13	5.07E+13
5	1.23E+14	1.04E+14	8.33E+13	6.69E+13	5.10E+13
7.5	1.26E+14	1.07E+14	8.54E+13	6.77E+13	5.19E+13
10	1.25E+14	1.05E+14	8.47E+13	6.76E+13	5.18E+13
12.5	1.27E+14	1.07E+14	8.58E+13	6.86E+13	5.24E+13
15	1.28E+14	1.08E+14	8.68E+13	6.92E+13	5.30E+13
17.5	1.31E+14	1.10E+14	8.85E+13	7.03E+13	5.37E+13
20	1.34E+14	1.12E+14	8.97E+13	7.16E+13	5.44E+13
22.5	1.35E+14	1.14E+14	9.15E+13	7.26E+13	5.55E+13
25	1.38E+14	1.16E+14	9.30E+13	7.39E+13	5.64E+13
27.5	1.40E+14	1.18E+14	9.46E+13	7.53E+13	5.76E+13
30	1.43E+14	1.20E+14	9.63E+13	7.64E+13	5.85E+13
32.5	1.46E+14	1.22E+14	9.79E+13	7.77E+13	5.93E+13
35	1.48E+14	1.23E+14	9.93E+13	7.89E+13	6.03E+13
37.5	1.49E+14	1.25E+14	1.00E+14	8.01E+13	6.13E+13
40	1.50E+14	1.26E+14	1.01E+14	8.11E+13	6.17E+13
42.5	1.52E+14	1.28E+14	1.02E+14	8.13E+13	6.21E+13
45	1.50E+14	1.26E+14	1.02E+14	8.07E+13	6.16E+13
47.5	1.50E+14	1.26E+14	1.01E+14	8.08E+13	6.17E+13
50	1.49E+14	1.26E+14	1.01E+14	8.04E+13	6.14E+13
52.5	1.49E+14	1.26E+14	1.01E+14	8.01E+13	6.11E+13
55	1.48E+14	1.25E+14	9.95E+13	7.94E+13	6.05E+13
57.5	1.49E+14	1.24E+14	9.95E+13	7.86E+13	6.02E+13
60	1.45E+14	1.21E+14	9.77E+13	7.75E+13	5.92E+13
62.5	1.42E+14	1.19E+14	9.61E+13	7.68E+13	5.85E+13
65	1.39E+14	1.17E+14	9.39E+13	7.50E+13	5.73E+13
67.5	1.36E+14	1.15E+14	9.23E+13	7.35E+13	5.62E+13
70	1.35E+14	1.13E+14	9.03E+13	7.19E+13	5.48E+13
72.5	1.32E+14	1.11E+14	8.87E+13	7.09E+13	5.40E+13
75	1.30E+14	1.10E+14	8.78E+13	6.98E+13	5.32E+13
77.5	1.27E+14	1.08E+14	8.64E+13	6.88E+13	5.24E+13
80	1.27E+14	1.07E+14	8.55E+13	6.78E+13	5.17E+13
82.5	1.25E+14	1.06E+14	8.48E+13	6.74E+13	5.12E+13
85	1.24E+14	1.05E+14	8.38E+13	6.67E+13	5.09E+13
87.5	1.23E+14	1.04E+14	8.36E+13	6.69E+13	5.09E+13
90	1.23E+14	1.04E+14	8.35E+13	6.64E+13	5.07E+13

Appendix Table C- 9 Fast Fluence at Locations in the Top Guide for Welds V1 and V3 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
194.73	5.35E+19	4.86E+19	4.37E+19	3.79E+19	1.80E+19
196.56	5.21E+19	4.00E+19	3.30E+19	2.57E+19	1.33E+19
198.39	4.85E+19	3.17E+19	2.26E+19	1.58E+19	8.66E+18
200.22	4.39E+19	2.67E+19	1.65E+19	1.05E+19	5.54E+18
202.05	3.98E+19	2.38E+19	1.36E+19	7.94E+18	3.88E+18
203.73	3.65E+19	2.14E+19	1.20E+19	6.66E+18	3.07E+18

Appendix Table C- 10 Fast Fluence at Locations in the Top Guide for Welds V2 and V4 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
194.73	5.37E+19	4.89E+19	4.40E+19	3.81E+19	1.81E+19
196.56	5.23E+19	4.02E+19	3.32E+19	2.59E+19	1.34E+19
198.39	4.87E+19	3.18E+19	2.27E+19	1.59E+19	8.71E+18
200.22	4.40E+19	2.68E+19	1.66E+19	1.06E+19	5.57E+18
202.05	3.99E+19	2.39E+19	1.37E+19	7.98E+18	3.90E+18
203.73	3.66E+19	2.14E+19	1.21E+19	6.69E+18	3.09E+18

Appendix Table C- 11 Fast Fluence at Locations in the Top Guide for Weld V5 and V6 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
162.19	1.72E+19	1.52E+19	1.27E+19	1.01E+19	7.43E+18
164.19	2.49E+19	2.23E+19	1.84E+19	1.44E+19	1.04E+19
166.19	3.47E+19	3.17E+19	2.64E+19	2.06E+19	1.49E+19
168.19	4.03E+19	3.70E+19	3.10E+19	2.43E+19	1.77E+19
170.19	4.73E+19	4.34E+19	3.60E+19	2.81E+19	2.03E+19
172.19	5.27E+19	4.84E+19	4.05E+19	3.18E+19	2.31E+19
174.19	5.55E+19	5.34E+19	4.60E+19	3.59E+19	2.59E+19
176.19	5.78E+19	5.63E+19	4.96E+19	3.90E+19	2.83E+19
178.19	5.85E+19	5.69E+19	4.98E+19	3.95E+19	2.88E+19
180.19	5.82E+19	5.66E+19	4.94E+19	3.90E+19	2.84E+19
182.19	5.75E+19	5.58E+19	4.84E+19	3.81E+19	2.77E+19
184.19	5.61E+19	5.46E+19	4.72E+19	3.69E+19	2.68E+19
186.19	5.42E+19	5.28E+19	4.54E+19	3.54E+19	2.57E+19
188.19	5.20E+19	5.07E+19	4.34E+19	3.37E+19	2.44E+19
190.19	4.97E+19	4.84E+19	4.12E+19	3.19E+19	2.30E+19
192.19	4.71E+19	4.61E+19	3.92E+19	3.02E+19	2.17E+19
194.73	4.03E+19	3.79E+19	3.20E+19	2.49E+19	1.80E+19

Appendix Table C- 12 Fast Fluence at Locations in the Top Guide for Welds V7 and V8 vs. Radial Location.

Location in Shroud	Height above BAF (inches)				
	157.82	158.91	160.00	161.10	162.19
Radial Location (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
0	6.14E+21	5.22E+21	4.44E+21	3.75E+21	3.14E+21
4	6.17E+21	5.25E+21	4.46E+21	3.77E+21	3.15E+21
8	6.21E+21	5.28E+21	4.48E+21	3.78E+21	3.15E+21
12	6.22E+21	5.29E+21	4.48E+21	3.79E+21	3.15E+21
16	6.22E+21	5.29E+21	4.48E+21	3.78E+21	3.15E+21
20	6.21E+21	5.28E+21	4.48E+21	3.78E+21	3.14E+21
24	6.20E+21	5.26E+21	4.46E+21	3.76E+21	3.13E+21
28	6.16E+21	5.23E+21	4.43E+21	3.73E+21	3.11E+21
32	6.10E+21	5.18E+21	4.38E+21	3.69E+21	3.07E+21
36	6.02E+21	5.11E+21	4.33E+21	3.64E+21	3.02E+21
40	5.91E+21	5.02E+21	4.25E+21	3.57E+21	2.97E+21
44	5.79E+21	4.91E+21	4.16E+21	3.49E+21	2.91E+21
48	5.64E+21	4.78E+21	4.05E+21	3.40E+21	2.83E+21
52	5.46E+21	4.63E+21	3.91E+21	3.29E+21	2.74E+21
56	5.25E+21	4.45E+21	3.76E+21	3.16E+21	2.64E+21
60	5.01E+21	4.24E+21	3.58E+21	3.02E+21	2.51E+21
64	4.74E+21	4.01E+21	3.38E+21	2.85E+21	2.37E+21
68	4.41E+21	3.73E+21	3.15E+21	2.66E+21	2.21E+21
72	4.07E+21	3.43E+21	2.89E+21	2.43E+21	2.02E+21
76	3.64E+21	3.07E+21	2.59E+21	2.18E+21	1.82E+21
80	3.13E+21	2.65E+21	2.25E+21	1.90E+21	1.58E+21
84	2.61E+21	2.20E+21	1.86E+21	1.56E+21	1.30E+21
88	2.01E+21	1.71E+21	1.46E+21	1.24E+21	1.04E+21
92	1.45E+21	1.25E+21	1.08E+21	9.25E+20	7.83E+20
96	9.18E+20	8.66E+20	7.62E+20	6.49E+20	5.27E+20
100	2.61E+20	2.43E+20	2.01E+20	1.61E+20	1.26E+20
104	8.88E+19	8.02E+19	6.55E+19	5.40E+19	4.71E+19
108	2.99E+19	2.63E+19	2.31E+19	2.13E+19	2.20E+19
112.17	5.09E+18	4.91E+18	5.02E+18	5.87E+18	7.46E+18

Appendix Table C- 13 Fast Fluence at Locations in the Top Guide for Welds V9 and V11 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
151.94	1.24E+20	1.02E+20	6.93E+19	4.42E+19	2.92E+19
153.75	1.01E+20	8.14E+19	5.86E+19	3.99E+19	2.39E+19
155.57	8.14E+19	6.64E+19	4.80E+19	3.29E+19	1.97E+19
157.38	6.96E+19	5.49E+19	3.94E+19	2.73E+19	1.70E+19
159.19	5.31E+19	4.13E+19	3.09E+19	2.25E+19	1.60E+19

Appendix Table C- 14 Fast Fluence at Locations in the Top Guide for Welds V10 and V12 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
151.94	1.25E+20	1.03E+20	6.99E+19	4.46E+19	2.94E+19
153.75	1.01E+20	8.22E+19	5.91E+19	4.02E+19	2.40E+19
155.57	8.20E+19	6.68E+19	4.83E+19	3.31E+19	1.98E+19
157.38	7.00E+19	5.53E+19	3.96E+19	2.74E+19	1.71E+19
159.19	5.34E+19	4.16E+19	3.10E+19	2.26E+19	1.61E+19

Appendix Table C- 15 Fast Fluence at Locations in the Shroud for Weld V13 and V14 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
99.19	6.57E+20	5.94E+20	4.94E+20	3.91E+20	2.85E+20
102.00	6.59E+20	5.95E+20	4.96E+20	3.92E+20	2.86E+20
105.00	6.59E+20	5.96E+20	4.96E+20	3.92E+20	2.86E+20
108.00	6.59E+20	5.96E+20	4.96E+20	3.92E+20	2.86E+20
111.00	6.58E+20	5.95E+20	4.95E+20	3.91E+20	2.86E+20
114.00	6.55E+20	5.92E+20	4.93E+20	3.89E+20	2.84E+20
117.00	6.49E+20	5.87E+20	4.89E+20	3.86E+20	2.82E+20
120.00	6.40E+20	5.78E+20	4.81E+20	3.80E+20	2.78E+20
123.00	6.25E+20	5.65E+20	4.70E+20	3.71E+20	2.71E+20
126.00	6.03E+20	5.45E+20	4.53E+20	3.58E+20	2.61E+20
129.00	5.72E+20	5.17E+20	4.30E+20	3.39E+20	2.47E+20
132.00	5.30E+20	4.79E+20	3.98E+20	3.14E+20	2.29E+20
135.00	4.78E+20	4.31E+20	3.58E+20	2.83E+20	2.06E+20
138.00	4.14E+20	3.74E+20	3.11E+20	2.45E+20	1.79E+20
141.00	3.44E+20	3.11E+20	2.58E+20	2.04E+20	1.49E+20
144.00	2.69E+20	2.43E+20	2.03E+20	1.60E+20	1.17E+20
147.00	1.99E+20	1.80E+20	1.50E+20	1.19E+20	8.72E+19
150.00	1.40E+20	1.27E+20	1.07E+20	8.52E+19	6.27E+19
151.94	1.14E+20	1.03E+20	8.73E+19	7.13E+19	5.55E+19

Appendix Table C- 16 Fast Fluence at Locations in the Shroud for Weld V15 and V16 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
9.42	2.81E+20	2.54E+20	2.11E+20	1.66E+20	1.21E+20
12.00	3.10E+20	2.80E+20	2.33E+20	1.84E+20	1.34E+20
15.00	3.38E+20	3.06E+20	2.54E+20	2.01E+20	1.47E+20
18.00	3.60E+20	3.25E+20	2.71E+20	2.14E+20	1.57E+20
21.00	3.77E+20	3.41E+20	2.84E+20	2.25E+20	1.64E+20
24.00	3.92E+20	3.55E+20	2.96E+20	2.34E+20	1.71E+20
27.00	4.06E+20	3.68E+20	3.06E+20	2.42E+20	1.77E+20
30.00	4.20E+20	3.80E+20	3.16E+20	2.50E+20	1.83E+20
33.00	4.33E+20	3.92E+20	3.27E+20	2.58E+20	1.89E+20
36.00	4.47E+20	4.04E+20	3.37E+20	2.66E+20	1.95E+20
39.00	4.60E+20	4.16E+20	3.46E+20	2.74E+20	2.00E+20
42.00	4.72E+20	4.27E+20	3.56E+20	2.82E+20	2.06E+20
45.00	4.84E+20	4.38E+20	3.65E+20	2.89E+20	2.11E+20
48.00	4.95E+20	4.48E+20	3.73E+20	2.95E+20	2.16E+20
51.00	5.06E+20	4.58E+20	3.82E+20	3.02E+20	2.21E+20
54.00	5.17E+20	4.68E+20	3.90E+20	3.08E+20	2.25E+20
57.00	5.28E+20	4.77E+20	3.98E+20	3.15E+20	2.30E+20
60.00	5.39E+20	4.87E+20	4.06E+20	3.21E+20	2.35E+20
63.00	5.50E+20	4.97E+20	4.14E+20	3.27E+20	2.39E+20
66.00	5.61E+20	5.07E+20	4.22E+20	3.34E+20	2.44E+20
69.00	5.72E+20	5.17E+20	4.31E+20	3.41E+20	2.49E+20
72.00	5.84E+20	5.28E+20	4.39E+20	3.48E+20	2.54E+20
75.00	5.95E+20	5.38E+20	4.48E+20	3.54E+20	2.59E+20
78.00	6.06E+20	5.48E+20	4.56E+20	3.61E+20	2.63E+20
81.00	6.16E+20	5.57E+20	4.63E+20	3.67E+20	2.68E+20
84.00	6.26E+20	5.66E+20	4.71E+20	3.72E+20	2.72E+20
87.00	6.34E+20	5.74E+20	4.77E+20	3.78E+20	2.76E+20
90.00	6.42E+20	5.80E+20	4.83E+20	3.82E+20	2.79E+20
93.00	6.48E+20	5.86E+20	4.88E+20	3.86E+20	2.82E+20
96.00	6.53E+20	5.91E+20	4.92E+20	3.89E+20	2.84E+20
99.19	6.57E+20	5.94E+20	4.94E+20	3.91E+20	2.85E+20

Appendix Table C- 17 Fast Fluence at Locations in the Shroud for Welds V17 and V18 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
-24.93	3.17E+17	2.83E+17	2.40E+17	1.98E+17	1.54E+17
-23.31	4.38E+17	4.07E+17	3.51E+17	2.91E+17	2.28E+17
-21.31	7.24E+17	6.72E+17	5.81E+17	4.83E+17	3.79E+17
-19.31	1.21E+18	1.14E+18	9.83E+17	8.20E+17	6.43E+17
-17.31	2.09E+18	1.95E+18	1.69E+18	1.42E+18	1.12E+18
-15.31	3.64E+18	3.43E+18	3.00E+18	2.54E+18	2.00E+18
-13.31	6.55E+18	6.26E+18	5.54E+18	4.66E+18	3.65E+18
-11.31	1.23E+19	1.19E+19	1.05E+19	8.72E+18	6.70E+18
-9.31	2.39E+19	2.20E+19	1.86E+19	1.51E+19	1.14E+19
-7.31	3.53E+19	3.31E+19	2.81E+19	2.27E+19	1.70E+19
-5.31	5.17E+19	4.83E+19	4.10E+19	3.32E+19	2.48E+19
-3.31	7.36E+19	6.86E+19	5.82E+19	4.69E+19	3.50E+19
-1.31	1.05E+20	9.75E+19	8.23E+19	6.60E+19	4.89E+19
0.69	1.37E+20	1.27E+20	1.07E+20	8.54E+19	6.31E+19
2.69	1.75E+20	1.61E+20	1.35E+20	1.08E+20	7.92E+19
4.69	2.11E+20	1.94E+20	1.63E+20	1.30E+20	9.56E+19
6.69	2.42E+20	2.23E+20	1.87E+20	1.49E+20	1.10E+20
8.69	2.73E+20	2.51E+20	2.10E+20	1.68E+20	1.23E+20
9.42	2.84E+20	2.61E+20	2.19E+20	1.74E+20	1.28E+20

Appendix Table C- 18 Fast Fluence at Locations in the Shroud for Welds V19 and V21 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
-33.87	9.32E+16	6.13E+16	4.38E+16	2.63E+16	1.42E+16
-31.87	1.61E+17	1.12E+17	7.48E+16	4.83E+16	2.56E+16
-29.87	2.59E+17	1.84E+17	1.24E+17	8.03E+16	4.27E+16
-27.87	4.12E+17	3.01E+17	2.05E+17	1.32E+17	7.05E+16
-25.87	6.59E+17	4.96E+17	3.25E+17	2.16E+17	1.16E+17
-24.93	8.05E+17	6.18E+17	3.93E+17	2.69E+17	1.45E+17

Appendix Table C- 19 Fast Fluence at Locations in the Shroud for Welds V20 and V22 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
-33.87	9.33E+16	6.17E+16	4.42E+16	2.66E+16	1.43E+16
-31.87	1.62E+17	1.13E+17	7.56E+16	4.87E+16	2.58E+16
-29.87	2.61E+17	1.86E+17	1.26E+17	8.11E+16	4.32E+16
-27.87	4.18E+17	3.05E+17	2.07E+17	1.33E+17	7.14E+16
-25.87	6.73E+17	5.03E+17	3.29E+17	2.19E+17	1.17E+17
-24.93	8.15E+17	6.28E+17	3.98E+17	2.73E+17	1.47E+17

Appendix Table C- 20 Fast Fluence at Locations in the Shroud for Welds V23 and V24 vs. Height above BAF.

Location in Shroud	IR	1/4T	1/2T	3/4T	OR
Height above BAF (inches)	Fluence (E>1.0 MeV) at 54 EFPY n/cm^2				
-65.81	1.23E+14	1.04E+14	8.33E+13	6.69E+13	5.10E+13
-63.87	1.77E+14	1.49E+14	1.21E+14	9.44E+13	7.00E+13
-61.87	2.64E+14	2.23E+14	1.79E+14	1.41E+14	1.04E+14
-59.87	3.87E+14	3.27E+14	2.63E+14	2.08E+14	1.51E+14
-57.87	5.66E+14	4.84E+14	3.86E+14	3.02E+14	2.21E+14
-55.87	8.41E+14	7.08E+14	5.70E+14	4.48E+14	3.25E+14
-53.87	1.24E+15	1.06E+15	8.47E+14	6.61E+14	4.81E+14
-51.87	1.85E+15	1.57E+15	1.26E+15	9.79E+14	7.10E+14
-49.87	2.74E+15	2.32E+15	1.85E+15	1.44E+15	1.04E+15
-47.87	4.04E+15	3.39E+15	2.70E+15	2.10E+15	1.52E+15
-45.87	5.80E+15	4.91E+15	3.95E+15	3.08E+15	2.21E+15
-43.87	8.69E+15	7.41E+15	5.90E+15	4.56E+15	3.26E+15
-41.87	1.28E+16	1.10E+16	8.63E+15	6.61E+15	4.73E+15
-39.87	1.86E+16	1.58E+16	1.25E+16	9.53E+15	6.79E+15
-37.87	2.68E+16	2.28E+16	1.80E+16	1.38E+16	9.80E+15
-35.87	3.70E+16	3.15E+16	2.54E+16	2.03E+16	1.46E+16
-33.87	5.52E+16	4.82E+16	4.08E+16	3.37E+16	2.61E+16