



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

2.8

JUL 12 1979

All

MEMORANDUM FOR: ✓ R. E. Johnson
Engineering Branch
Division of Operating Reactors NRR

R. M. Gamble
Materials Engineering Branch
Division of Systems Safety, NRR

FROM: Milton Vagins
Metallurgy & Materials Research Branch
Division of Reactor Safety Research

THRU: C. Z. Serpan, Jr., Chief
Metallurgy & Materials Research Branch
Division of Reactor Safety Research

SUBJECT: RESULTS OF WORKING MEETING ON FRACTURE TOUGHNESS OF
IRRADIATED LOW SHELF ENERGY WELDMENTS

There was a meeting of contractors, RES and NRR personnel on the determination of the fracture toughness of irradiated low shelf energy weldments on Thursday and Friday, July 5 and 6, 1979 in Room 1235 of the Willste Building. Those in attendance were:

Thursday, July 5, 1979

- R. E. Johnson, NRR
- R. M. Gamble, NRR
- M. Vagins, RES
- P. Albrecht, RES
- G. D. Whitman, ORNL
- F. J. Loss, NRL
- H. Watson, NRL
- J. Williams, HEDL
- K. Carlson, HEDL

Friday, July 6, 1979

- M. Vagins, RES
- G. D. Whitman, ORNL
- F. J. Loss, NRL
- J. Williams, HEDL.

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The basic results are summarized as follows:

Referring to the attached specimen tabulations, each contractor will test the noted specimens.

ORNL

° Oak Ridge will complete testing of the following Charpy specimens:

From	<u>61-W</u>	<u>62-W</u>	<u>63-W</u>
Specimen No.	208	306	252
	209	307	253
	210	309	254
	211	310	255
	212	311	256
	213	317	257
	214	318	263
	---	361	---
	---	365	---

HEDL

° HEDL will complete testing of the following .5T specimens:

From	<u>61-W</u>	<u>62-W</u>	<u>63-W</u>
Transition	---	117	100
Specimen No.	---	119	101
	---	120	---
	---	152	---
	---	153	---
Upper Shelf	123	106	109
Specimen No.	124	159	123
	125	---	135
	---	---	137

NRL

° NRL will complete testing of the following .5T specimens:

From	<u>61-W</u>	<u>62-W</u>	<u>63-W</u>
Transition	---	147	---
Specimen No.	---	148	---
	---	155	---
Upper Shelf	---	100	108
Specimen No.	---	---	124
	---	---	127

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The .5TCT, Std (transition) specimens will be tested with no modification, i.e., no side grooves, using clip gages (HEDL and NRL) and LVDT (HEDL) instrumentation.

The .5TCT, J. MOD (upper shelf) will be tested with 10% side grooves with the same instrumentation as above.

Oak Ridge will carry out the modifications for HEDL; NRL will modify its own specimens.

All specimens are now at Oak Ridge. Oak Ridge will implement the following schedule:

- ° July 9, 1979 Commence Charpy testing.
- ° July 9, 1979 Commence packing and ship unmodified specimens to HEDL and NRL.
- ° July 16, 1979 Commence broaching 10% side grooves in .5, .8 and 1.6T modified specimens.
- ° July 23, 1979 Commence drilling and tapping .5T specimens.
- ° By August 17, 1979 Clean and ship all modified .5T specimens to HEDL.

HEDL and NRL will complete testing of all .5T specimens from weldments 61-W, 62-W and 63-W by September 21.

Thus, by September 21, 1979, we will have completed all available and suitable .5T and Charpy specimens arriving at transition curves and upper shelf data on this group of materials. At the same time, we will be preparing the .8 and 1.6T specimens for testing during the early part of FY 80 - hopefully a large portion of this data will be available by the end of November 1979. During this period, we will also progress on demonstrating proof-of-principal on the instrumentation required for remote testing of the irradiated 4T specimens. Further, during this period we will develop and schedule the test plan for the remainder of the 2nd and 3rd irradiations (i.e., 64-, 65-, 66- and 67-W).

Basically, by the end of September 1979, we will supply you with fracture toughness data on these three weldments with irradiation fluences and temperature ranges of $9-14 \times 10^{18}$ n/cm² and 520°-590°F, respectively.

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R. E. Johnson and R. M. Gamble

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We will also develop some limited data on the effect of lower fluences (less than 9×10^{18} n/cm²) and higher temperature (greater than 600°F). As data becomes available before the end of September, we will transmit it to you as it is received.

If you have any questions regarding this aspect of our program, please call me.



Milton Vagins
Metallurgy & Materials Research Branch
Division of Reactor Safety Research

Enclosure: Specimen tabulations

cc w/encl:
S. Hanauer, NRR
W. S. Hazelton, NRR
P. Albrecht, RES
F. J. Loss, NRL
J. Williams, HEDL

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 61W, Capsule A

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)		
Tensile, MT-S	61W-1	11	545-560	4	540-555	15	550
	-2	4	495-515	11	540-560	15	530
	-3	8	550-560	3	540-555	12	550
	-4	3	505-520	8	540-555	12	530
	-5	3	565-580	1	575-595	4	580
	-6	1	565-580	3	580-600	4	580
Tensile, MT	-7	4	615-620	5	620-635	10	620
	-8	3	615-620	5	675-690	8	650
	-9	3	605-610	4	610-630	7	615
1.6TCT, J Mod.	-30	8	565-580	4	570-585	12	575
	-31	8	500-510	6	535-550	13	525
0.8TCT, J. Mod.	-40	7	540-560	4	575-590	11	565
	-41	7	540-560	4	575-590	11	565
	-42	3	530-535	9	615-630	12	580
	-43	3	530-535	9	615-630	12	580
0.5TCT, J Mod.	-123	13	550-570	3	550-570	16	560
	-124	3	530-550	11	530-550	14	540
	-125	4	560-580	3	560-575	8	570
	-126	4	560-580	4	560-575	7	570
	-127	4	555-570	3	560-575	7	565
	-128	4	555-570	3	560-575	7	565
	-129	8	575-585	2	550-585	10	565
	-130	2	535-555	11	620-645	13	590
	-131	2	535-555	10	620-645	13	590
	-132	2	535-555	10	620-645	11	590
	-133	11	640-655	2	580-600	13	620
	-134	10	640-655	2	580-600	13	620
	-135	10	640-655	2	580-600	11	620
	-136	2	590-605	9	635-655	12	620
	-137	2	590-600	8	675-700	10	640
	-138	8	625-640	2	575-595	10	610
	-139	8	625-640	2	575-595	9	610
	-140	7	625-640	1	575-595	8	610
	-141	2	580-590	7	620-640	9	610
	0.5TCT, Std.	-100	13	560-580	3	540-560	16
-101		3	515-535	13	540-560	16	540
-102		11	555-575	3	540-560	14	560
-103		3	575-590	11	600-615	14	595
-104		8	555-560	3	570-580	10	565
-105		2	575-585	10	625-645	12	605
-106		10	555-560	2	570-580	12	565
-107		3	575-580	8	625-645	10	605
-108		1	575-580	5	605-630	6	600
-109		5	575-585	1	595-615	6	590
-110	5	575-585	1	595-615	6	590	

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 61W, Capsule A

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)	
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)			
O.5TCT, Std.	61W-111	1	575-585	5	605-630	6	600	
	-112	9	575-585	3	550-585	12	570	
	-113	8	575-585	3	550-585	11	570	
	-114	4	560-575	6	620-630	10	595	
	-115	4	560-575	5	620-630	9	595	
	-116	4	560-575	5	620-630	9	595	
	-117	7	635-655	2	645-660	9	650	
	-118	6	635-655	2	645-660	8	650	
	-119	6	635-655	2	645-660	8	650	
	Charpy V, Precracked	-261	9	580-600	2	580-600	11	590
-262		6	580-600	3	580-600	10	590	
-263		3	580-600	6	580-600	10	590	
-264		2	580-600	9	580-600	11	590	
-265		6	555-575	2	555-575	7	565	
-266		4	565-580	2	575-595	6	580	
-267		2	575-585	4	600-620	6	595	
-268		2	575-580	6	605-630	7	600	
Charpy V, Std.		-208	10	555-580	2	555-580	11	570
		-209	8	555-580	2	555-580	10	570
	-210	7	555-580	3	555-580	9	570	
	-211	6	555-580	3	555-580	9	570	
	-212	5	555-580	4	555-580	8	570	
	-213	4	555-580	5	555-580	8	570	
	-214	3	555-580	6	555-580	9	570	
	-215	3	575-585	7	625-645	9	610	
	-216	2	575-585	8	625-645	10	610	
	-217	2	575-585	10	625-645	11	610	
	-218	11	580-600	2	580-600	13	590	
	-219	7	580-600	3	580-600	10	590	
	-220	5	580-600	4	580-600	9	590	
	-221	4	580-600	5	580-600	9	590	
	-222	3	580-600	7	580-600	10	590	
	-223	2	580-600	11	580-600	13	590	
	-224	7	555-575	1	555-575	8	565	
	-225	5	555-575	2	555-575	7	565	
	-226	3	575-585	3	595-615	6	590	
	-227	3	575-585	3	595-615	6	590	
	-228	2	575-585	5	605-630	7	600	
	-229	1	575-585	7	605-630	8	600	
	-230	5	615-620	5	620-645	10	625	
	-231	4	615-620	5	620-645	9	625	
	-232	5	615-620	5	620-624	10	625	
-233	5	615-620	5	620-645	10	625		
-234	5	615-620	5	620-645	9	625		
-235	4	615-620	4	620-645	8	625		

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 61W, Capsule A

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence ($n/cm^2 \times 10^{18}$) (E > 1 Mev)	Median Temp. (°F)
		Fluence ($n/cm^2 \times 10^{18}$) (E > 1 Mev)	Temp. (°F)	Fluence ($n/cm^2 \times 10^{18}$) (E > 1 Mev)	Temp. (°F)		
Charpy V, Std.	61W-236	5	615-620	5	620-645	10	625
	-237	5	615-620	5	620-645	9	625
	-238	4	615-620	4	620-645	9	625
	-239	4	615-620	4	620-645	8	625
	-240	5	615-620	5	620-645	9	625
	-241	4	615-620	4	620-645	9	625
	-242	4	615-620	4	620-645	8	625
	-243	3	615-630	5	675-690	7	650
	-244	3	615-630	4	675-690	7	650
	-245	3	615-630	5	675-690	8	650
	-246	3	615-630	5	675-690	7	650
	-247	3	615-630	4	675-690	7	650
	-248	3	615-630	4	675-690	6	650
	-249	3	615-630	5	675-690	8	650
	-250	3	615-630	4	675-690	7	650
	-251	3	615-630	4	675-690	7	650
	-252	2	615-630	4	675-690	6	650
	-253	3	615-630	4	675-690	7	650
	-254	3	615-630	4	675-690	7	650
	-255	2	615-630	4	675-690	6	650
	-256	3	605-610	3	610-630	7	610
	-257	3	605-610	3	610-630	6	610
	-258	4	605-610	4	610-630	7	610
	-259	4	605-610	4	610-630	8	610
	-260	3	605-610	4	610-630	7	610
	-289	3	605-610	4	610-630	7	610
	-290	3	605-610	3	610-630	7	610
	-291	3	605-610	3	610-630	6	610
	-292	4	605-610	4	610-630	8	610
	-293	3	605-610	4	610-630	7	610
	-294	3	605-610	4	610-630	7	610
	-295	3	605-610	3	610-630	6	610
	-296	3	605-610	4	610-630	7	610

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 62W, Capsule B

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)		
Tensile, MT	62W-1	4	595-610	7	570-600	11	595
	-2	4	485-500	4	575-590	8	540
	-3	3	565-590	6	565-590	8	580
Tensile, MT-S	-8	11	540-550	4	515-545	15	540
	-9	4	505-510	11	530-555	15	525
	-10	10	550-565	4	545-555	14	555
	-11	4	495-505	10	535-656	14	525
	-13	3	485-515	1	500-540	5	510
	-19	1	485-515	3	520-555	5	520
1.6TCT, J Mod.	-34	10	545-560	6	550-570	16	555
	-35	7	515-530	7	600-615	14	565
0.8TCT, J Mod.	-41	6	590-610	7	590-605	13	600
	-42	6	590-610	7	590-605	13	600
	-43	12	650-660	3	575-590	15	620
	-44	12	650-660	3	575-590	15	620
0.5TCT, J Mod.	-100	7	530-560	6	545-575	13	550
	-101	3	500-530	12	560-590	15	545
	-102	4	545-560	4	575-590	8	565
	-103	5	545-560	4	575-590	8	565
	-104	4	490-525	4	525-560	8	525
	-105	4	490-525	4	525-560	8	525
	-106	10	555-575	2	575-595	12	575
	-107	3	535-545	9	635-655	12	590
	-109	3	535-545	8	635-655	11	590
	-110	3	535-545	8	635-655	10	590
	-111	9	630-660	3	535-560	12	595
	-128	8	630-660	3	535-560	11	595
	-129	8	630-660	3	535-560	10	595
	-130	2	560-580	12	575-615	14	580
	-132	2	445-470	7	565-580	9	515
	-133	7	620-645	2	560-570	9	600
	-134	6	620-645	2	560-570	6	600
	-158	5	620-645	2	560-570	7	600
	-159	1	530-550	10	570-590	12	560
0.5TCT, S.d.	-114	13	535-565	3	520-550	16	540
	-115	3	490-520	13	545-575	16	530
	-116	12	545-575	3	555-580	15	565
	-117	7	550-565	5	565-590	12	570
	-118	2	525-540	8	590-610	10	565
	-119	8	555-570	2	545-565	10	560
	-120	8	555-570	2	545-565	10	560
	-121	2	525-540	8	590-610	10	565
	-142	5	480-510	1	470-515	6	495
	-143	1	465-500	5	515-550	6	510
	-144	4	480-510	1	470-515	6	495

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 62W, Capsule B

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)	
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)			
0.5TCT, Std.	62W-146	1	465-500	5	515-550	6	510	
	-147	12	555-575	2	575-595	14	575	
	-148	11	555-575	2	575-595	13	575	
	-149	6	555-565	4	625-645	10	600	
	-150	6	555-565	4	625-645	10	600	
	-151	5	555-565	4	625-645	9	600	
	-152	10	530-550	2	560-570	11	550	
	-153	9	530-550	2	560-570	11	550	
	-155	8	530-550	1	560-570	9	550	
	Charpy V, Precracked	-208	10	550-560	3	540-550	13	550
		-209	7	550-560	4	540-550	11	550
-210		4	550-560	7	540-550	11	550	
-211		3	550-560	10	540-550	13	550	
-213		6	480-510	2	470-515	8	495	
-216		4	485-520	3	500-540	7	510	
-217		3	480-515	4	520-555	7	520	
-218		2	465-500	6	515-550	8	510	
Charpy V, Std.		-305	11	555-570	2	545-565	13	560
		-306	9	555-570	2	545-565	11	560
		-307	7	555-570	3	545-565	10	560
	-308	6	545-560	3	575-590	9	565	
	-309	5	545-560	4	575-590	9	565	
	-310	4	545-560	5	575-590	9	565	
	-311	3	545-560	6	575-590	9	565	
	-312	3	525-540	7	590-610	10	565	
	-313	2	525-540	9	590-610	11	565	
	-314	2	525-540	11	590-610	13	565	
	-315	12	550-560	2	540-550	15	550	
	-316	8	550-560	3	540-550	12	550	
	-317	6	550-560	5	540-550	11	550	
	-318	5	550-560	6	540-550	11	550	
	-319	3	550-560	8	540-550	12	550	
	-320	2	550-560	12	540-550	15	550	
	-321	8	480-510	1	470-515	9	495	
	-322	5	480-510	2	470-515	7	495	
	-323	4	490-525	3	525-560	7	525	
	-324	3	490-525	4	525-560	7	525	
	-325	2	465-500	5	515-550	7	510	
	-326	1	465-500	8	515-550	9	510	
	-327	4	595-610	6	570-600	10	595	
-328	4	595-610	6	570-600	10	595		
-329	4	595-610	7	570-600	11	595		
-330	4	595-610	7	570-600	10	595		
-331	4	595-610	6	570-600	10	595		
-332	3	595-610	6	570-600	9	595		

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 62W, Capsule B

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)		
Charpy V, Std.	62W-335	4	595-610	7	570-600	11	595
	-336	4	595-610	7	570-600	10	595
	-337	3	595-610	6	570-600	10	595
	-338	3	595-610	6	570-600	9	595
	-339	3	595-610	7	570-600	10	595
	-340	3	595-610	6	570-600	10	595
	-341	3	595-610	6	570-600	9	595
	-342	4	485-500	4	575-590	8	540
	-343	3	485-500	3	575-590	7	540
	-344	4	485-500	4	575-590	8	540
	-345	4	485-500	4	575-590	8	540
	-346	4	485-500	3	575-590	7	540
	-347	3	485-500	3	575-590	6	540
	-348	4	485-500	4	575-590	8	540
	-349	4	485-500	4	575-590	8	540
	-350	4	485-500	3	575-590	7	540
	-351	3	485-500	3	575-590	6	540
	-352	4	485-500	4	575-590	8	540
	-353	4	485-500	3	575-590	7	540
	-354	4	485-500	3	575-590	7	540
	-355	2	565-590	5	565-590	8	580
	-356	2	565-590	5	565-590	7	580
	-357	3	565-590	6	565-590	9	580
	-358	3	565-590	5	565-590	8	580
	-359	3	565-590	5	565-590	7	580
	-360	2	565-590	5	565-590	7	580
	-361	3	565-590	6	565-590	9	580
	-362	3	565-590	5	565-590	8	580
	-363	3	565-590	5	565-590	8	580
	-364	2	565-590	5	565-590	7	580
	-365	3	565-590	5	565-590	9	580
	-366	3	565-590	5	565-590	8	580
	-367	3	565-590	5	565-590	7	580

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SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weidment 63W, Capsule C

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)	
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)			
Tensile, MT-S	63W-1	4	530-540	9	540-560	13	540	
	-2	9	545-560	4	510-520	13	535	
	-3	9	550-560	4	530-550	13	550	
	-4	4	520-525	9	530-550	13	530	
	-5	1	535-555	3	545-565	4	550	
	-9	3	540-560	1	535-555	4	550	
Tensile, MT	-13	3	540-555	6	625-640	9	590	
	-14	4	595-605	3	550-560	7	580	
	-15	3	535-575	5	640-655	8	600	
1.6TCT, J Mod.	-30	9	600-615	4	525-540	13	570	
	-31	7	480-505	6	510-530	14	505	
0.8TCT, J Mod.	-40	6	510-530	5	565-575	11	545	
	-41	6	510-530	5	565-575	11	545	
	-42	3	505-520	11	615-630	14	570	
	-43	3	505-520	11	615-630	14	570	
0.5TCT, J Mod.	-108	6	555-585	5	545-575	11	565	
	-109	10	565-595	2	550-580	12	570	
	-110	4	595-625	3	580-595	7	600	
	-112	3	595-625	3	580-595	7	600	
	-113	3	545-565	2	545-565	5	555	
	-121	2	545-565	2	545-565	5	555	
	-122	10	610-635	1	490-505	11	560	
	-123	3	560-595	7	530-540	10	555	
	-124	3	560-595	6	530-540	9	555	
	-125	2	560-595	6	530-540	8	555	
	-127	7	555-580	3	560-580	10	570	
	-135	6	555-580	3	560-580	9	570	
	-138	6	555-580	2	560-580	8	570	
	-140	2	495-505	11	590-600	13	550	
	-157	2	550-570	7	540-555	9	555	
	-158	7	560-590	2	605-620	9	595	
	-159	c	560-590	2	605-620	8	595	
	-160	6	560-590	2	605-620	7	595	
	0.5TCT, Std.	-162	1	515-545	9	630-650	10	585
		-100	3	545-575	11	555-585	14	565
-101		11	545-575	3	510-540	14	540	
-102		2	565-595	10	570-600	12	580	
-104		5	585-615	4	575-590	10	590	
-105		2	600-620	6	600-610	8	610	
-106		7	575-635	2	560-575	9	585	
-114		2	600-620	7	600-610	9	610	
-115		6	575-635	2	560-575	8	585	
-116		1	525-545	4	545-560	6	545	
-117		5	535-555	1	520-545	6	540	
-118		1	525-545	5	545-560	6	545	

1740 011

SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 63 W, Capsule C

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)	
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)			
0.5TCT, Std.	63W-119	4	535-555	1	520-545	6	540	
	-120	11	610-635	2	490-505	13	560	
	-128	10	610-635	2	490-505	12	560	
	-129	5	590-625	3	525-540	9	570	
	-130	5	590-625	3	525-540	8	570	
	-131	5	590-625	3	525-540	8	570	
	-132	9	635-645	2	535-550	10	590	
	-133	8	635-645	2	535-550	9	590	
	-134	7	635-645	1	535-550	8	590	
	Charpy V, Precracked	-201	3	555-570	10	540-560	12	555
		-202	4	555-570	7	540-560	11	555
		-203	7	555-570	4	540-560	11	555
		-204	10	555-570	3	540-560	12	555
		-205	2	525-555	6	520-560	8	540
-206		2	535-560	4	530-565	7	550	
-207		4	535-560	2	530-565	7	550	
-208		6	525-555	2	520-560	8	540	
Charpy V, Std.		-242	2	600-620	9	600-610	10	610
		-243	2	600-620	7	600-610	9	610
	-244	2	600-620	6	600-610	8	610	
	-245	3	595-625	5	580-595	8	600	
	-246	3	595-625	4	580-595	7	600	
	-247	4	595-625	3	580-595	7	600	
	-248	5	595-625	3	580-595	8	600	
	-249	6	575-635	2	560-575	8	585	
	-250	7	575-635	2	560-575	9	585	
	-251	9	575-635	2	560-575	10	585	
	-252	2	555-570	12	540-560	14	555	
	-253	3	555-570	8	540-560	11	555	
	-254	5	555-570	6	540-560	10	555	
	-255	6	555-570	5	540-560	10	555	
	-256	8	555-570	3	540-560	11	555	
	-257	12	555-570	2	540-560	14	555	
	-258	1	525-555	7	520-560	9	540	
	-259	2	525-555	5	520-560	7	540	
	-260	3	545-565	4	545-565	6	555	
	-261	4	545-565	3	545-565	6	555	
	-262	5	525-555	2	520-560	7	540	
	-263	7	525-555	1	520-560	9	540	
	-264	3	540-555	6	625-640	9	590	
	-265	2	540-555	6	625-640	8	590	
	-266	3	540-555	6	625-640	9	590	
	-267	3	540-555	6	625-640	9	590	
	-268	3	540-555	6	625-640	8	590	
	-269	3	540-555	5	625-640	8	590	

1740 012

SECOND 4T-CT IRRADIATION EXPERIMENT

(HSST-BSR-1)

Weldment 63W, Capsule C

Specimen Type	Specimen No.	Forward Position		Reverse Position		Total Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Median Temp. (°F)
		Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)	Fluence (n/cm ² × 10 ¹⁸) (E > 1 Mev)	Temp. (°F)		
Charpy V, Std.	63W-270	3	540-555	6	625-640	9	590
	-271	3	540-555	6	625-640	9	590
	-272	3	540-555	6	625-640	9	590
	-273	3	540-555	5	625-640	8	590
	-274	3	540-555	6	625-640	9	590
	-275	3	540-555	6	625-640	9	590
	-276	3	540-555	5	625-640	8	590
	-277	3	595-605	3	550-560	7	580
	-278	3	595-605	3	550-560	6	580
	-279	4	595-605	4	550-560	8	580
	-280	4	595-605	4	550-560	7	580
	-281	3	595-605	3	550-560	7	580
	-282	3	595-605	3	550-560	6	580
	-283	4	595-605	4	550-560	8	580
	-284	4	595-605	4	550-560	7	580
	-285	3	595-605	4	550-560	7	580
	-286	3	595-605	3	550-560	6	580
	-287	4	595-605	4	550-560	8	580
	-288	3	595-605	4	550-560	7	580
	-289	3	595-605	3	550-560	6	580
	-290	3	535-575	5	640-655	8	600
	-291	3	535-575	4	640-655	7	600
	-292	3	535-575	5	640-655	8	600
	-293	3	535-575	5	640-655	8	600
	-294	3	535-575	4	640-655	7	600
	-295	2	535-575	4	640-655	6	600
	-296	3	535-575	5	640-655	8	600
	-297	3	535-575	5	640-655	7	600
	-298	3	535-575	4	640-655	7	600
	-299	2	535-575	4	640-655	6	600
	-300	3	535-575	5	640-655	8	600
	-301	2	535-575	5	640-655	7	600
-302	2	535-575	4	640-655	6	600	

1740 013