LOADING DIAGRAMS OF EXPERIMENTAL SUBASSEMBLIES
STARTING IRRADIATION IN EBR-II RUNS 51-62

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MASTER

Position	Sponsor	Ident. No.	Comments
1	HEDL	3-51	Unirradiated
2		3-35	
3		3-2	
4		3-5	
5		3-32	
6		3-34	
7		3-1	
8		3-4	
9		3-9	
10		3-21	
11		3-24	
12		3-36	
13		3-3	
14		3-14	
15		3-17	
16		3-20	
17		3-71	Unirradiated
18		3-25	
19		3-37	
20		3-41	Unirradiated
21		3-16	
22		3-19	
23		3-22	
24		3-26	Unirradiated
25		3-30	
26		3-7	
27		3-15	
28		3-18	
29		3-50	
30		3-29	
31		3-6	
32		3-11	
33		3-13	
34		3-28	
35		3-31	
36		3-10	
37		3-12	

Subassembly No. X051A (PNL-3 Oxide Fuel Elements)

Type Hardware: MK-F-37A

Orifice: No. of Holes 3; Dia. of Holes See Note 1

Lower Adapter Modifications: Per EB-1-50448

Flow Test Data: ~31 gpm in row 4

Date Assembled: 9/28/71; Location HFEF

Date Loaded in Reactor: 10/9/71; for Run 52

Initial Grid Position: 4E1

Notes:

1. Series orifice per EB-1-51975, with one 0.652-in. hole in transverse plate and two 0.461-in. radial holes.

2. UO_2 -25 wt % PuO_2 fuel; natural uranium.

3. All elements other than unirradiated ones are

Position	Sponsor	Ident. No.	Comments
1	LASL	UNC-135	
2		-144	
3		-147	
4		-129	
5		-134	
6		-140	
7		-138A	
8		-130	
9		-132	
10		-143	
11		-145	
12		-137	
13		-131	
14		-136	
15		-141	
16		-139	
17		-133	
18		-142	
19		-146A	

AS-BUILT LOADING SPECIFICATIONS

Subassembly No. X055B

Type Hardware: MK-A-19A

Orifice: No. of Holes 7; Dia. of Holes 0.156

Lower Adapter Modifications: None

Flow Test Data: ~29 gpm in row 7

Date Assembled: 1/11/73; Location HFEF

Date Loaded in Reactor: 2/21/73; for Run 62

Initial Grid Position: 7D6

Notes:

- Hardware utilizes the elongated dimple alternate on the 19 shroud tubes.
- All capsules contain $(U_{0.85} - Pu_{0.15})C$ fuel; uranium 60% enriched.

Position	Sponsor	Ident. No.	Comments
1	HEDL	4-27	
2		4-30	
3		4-33	
4		4-36	
5		4-60	Unirradiated
6		4-29	
7		4-32	
8		4-35	
9		4-37	
10		4-21	
11		4-28	
12		4-31	
13		4-61	Unirradiated
14		4-9	
15		4-11	
16		4-70	Unirradiated
17		4-23	
18		4-25	
19		4-5	
20		4-8	
21		4-17	
22		4-13	
23		4-22	
24		4-24	
25		4-4	
26		4-14	
27		4-16	
28		4-19	
29		4-40	Unirradiated
30		4-3	
31		4-7	
32		4-15	
33		4-18	
34		4-2	
35		4-6	
36		4-10	
37		4-12	

Subassembly No. X059A (PNL-4 Oxide Fuel Elements)

Type Hardware: HK-F-37A

Orifice: No. of Holes 7; Dia. of Holes 0.235

Lower Adapter Modifications: Per EB-1-50552

Flow Test Data: ~ 46.5 gpm in row 6

Date Assembled: 10/13/71; Location HFEF

Date Loaded in Reactor: 10/17/71; for Run 52

Initial Grid Position: 6A3

Notes:

1. UO_2 -25 wt % PuO_2 fuel; uranium 45% enriched.
2. All elements other than unirradiated ones are from X059.

Position	Sponsor	Ident. No.	Comments
1	ANL	P21	Structural
2	ANL	P32	Structural
3	ANL	P36	Structural
4	ANL	P41	Structural
5	ANL	P30	Structural
6	ANL	P34	Structural
7	ANL	P2	Structural
8	ANL	P42	Structural
9	ANL	P44	Structural
10	ANL	P19	Structural
11		Dummy	
12	ANL	P38	Structural
13	ANL	P49	Structural
14	ANL	P57	Structural
15	ANL	P39	Structural
16	ANL	P48	Structural
17	ANL	P29	Structural
18	ANL	P40	Structural
19	ANL	P7	Structural

Subassembly No. X065G

Type Hardware: MK-T-19

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~ 17 gpm in row 7

Date Assembled: 1/27/72; Location HFEF

Date Loaded in Reactor: 2/2/72; for Run 54A

Initial Grid Position: 7F5

Position	Sponsor	Ident. No.	Comments
1	ANL	P21	Structural
2	ANL	P32	Structural
3	ANL	P36	Structural
4	ANL	P41	Structural
5	ANL	P30	Structural
6	ANL	P34	Structural
7	ANL	P-2	Structural
8		Dummy	
9	ANL	P44	Structural
10	ANL	P19	Structural
11		Dummy	
12	ANL	P38	Structural
13	ANL	P49	Structural
14	ANL	P57	Structural
15	ANL	P39	Structural
16	ANL	P48	Structural
17	ANL	P29	Structural
18	ANL	P40	Structural
19	ANL	P-7	Structural

Subassembly No. X065H

Type Hardware: MK-T-19

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~17 gpm in row 7

Date Assembled: 6/15/72; Location HFEF

Date Loaded in Reactor: 6/27/72; for Run 56A

Initial Grid Position: 7F5

Position	Sponsor	Ident. No.	Comments
1	ANL	265	<u>Mark-II driver</u>
2		237	
3		E-15	
4		208	Unirrad.
5		266	
6		264	
7		E-1	
8		232	
9		E-17	
10		233	Unirrad.
11		E-12	
12		E-16	
13		253	Unirrad.
14		263	
15		256	
16		288	
17		267	
18		257	Unirrad.
19		224	
20		284	
21		200	
22		270	
23		209	
24		E-10	
25		275	
26		E-6	
27		202	
28		287	
29		225	
30		289	
31		E-7	
32		223	
33		276	
34		277	
35		E-3	
36		269	
37		274	

Subassembly No. X071B

Type Hardware: MK-B-37

Orifice: No. of Holes 7; Dia. of Holes 0.250

Lower Adapter Modifications: None

Flow Test Data: ~48 gpm in row 6

Date Assembled: 2/29/72; Location HFFR

Date Loaded in Reactor: 3/4/72; for Run 55

Initial Grid Position: 6E5

Note:

Irradiated capsules are from X071A.

Position	Sponsor	Ident. No.	Comments
1	ANL	255	
2		235	Unirradiated
3		E-15	
4		208	
5		266	
6		264	
7		E-1	
8		232	
9		E-17	
10		233	
11		E-12	
12		E-16	
13		253	
14		263	
15		256	
16		288	
17		267	
18		257	
19		224	
20		284	
21		200	
22		270	
23		209	
24		E-10	
25		275	
26		E-6	
27		202	
28		287	
29		226	Unirradiated
30		282	Unirradiated
31		E-7	
32		223	
33		276	
34		277	
35		E-3	
36		269	
37		274	

Subassembly No. X071C

Type Hardware: MK-B-37

Orifice: No. of Holes 7; Dia. of Holes 0.250

Lower Adapter Modifications: None

Flow Test Data: ~50 gpm in row 6 @ 45 psi

Date Assembled: 5/24/72; Location HFEF

Date Loaded in Reactor: 6/25/72; for Run 56

Initial Grid Position: 6E1

Notes:

1. All capsules contain Mark-II driver fuel.

2. Irradiated capsules are from X071B.

Position	Sponsor	Ident. No.	Comments
1	ANL	265	
2		235	
3		E-15	
4		208	
5		260	Unirradiated
6		264	
7		E-1	
8		232	
9		E-17	
10		233	
11		E-12	
12		E-16	
13		253	
14		231	Unirradiated
15		256	
16		288	
17		267	
18		257	
19		224	
20		284	
21		200	
22		270	
23		209	
24		E-10	
25		275	
26		E-6	
27		202	
28		287	
29		226	
30		282	
31		E-7	
32		223	
33		276	
34		277	
35		E-3	
36		269	
37		274	

AS-BUILT LOADING SPECIFICATIONS

Subassembly No. X071D

Type Hardware: MK-B-37

Orifice: No. of Holes 7; Dia. of Holes 0.250

Lower Adapter Modifications: None

Flow Test Data: ~50 gpm in row 6

Date Assembled: 12/7/72; Location HFEF

Date Loaded in Reactor: 12/10/72; for Run 60

Initial Grid Position: 6C1

Note:

All capsules contain Mark-II driver fuel.

Position	Sponsor	Ident. No.	Comments
1	HEDL	8-44	
2		8-2	
3		8-39	
4		8-4	
5		8-5	
6		8-6	
7		8-7	
8		8-8	
9		8-9	
10		8-10	
11		8-1	Unirradiated
12		8-12	
13		8-13	
14		8-14	
15		8-15	
16		8-16	
17		8-17	
18		8-18	
19		8-19	
20		8-20	
21		8-21	
22		8-22	
23		8-23	
24		8-24	
25		8-27	Unirradiated
26		8-26	
27		8-40	
28		8-43	Unirradiated
29		8-29	
30		8-30	
31		8-31	
32		8-32	
33		8-33	
34		8-34	
35		8-35	
36		8-36	
37		8-45	Unirradiated

Subassembly No. X074B (PNL-8)

Type Hardware: MK-H-37A

Orifice: No. of Holes 7; Dia. of Holes 0.349

Lower Adapter Modifications: Increased-flow Type

Flow Test Data: ~ 63 gpm in row 7 @ 45 psi

Date Assembled: 6/12/72; Location HFEF

Date Loaded in Reactor: 6/27/72; for Run 56

Initial Grid Position: 7C4

Notes:

1. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.
2. Irradiated elements are from X074A.

Pos.	Sponsor	Ident.	Pos.	Sponsor	Ident.
1	ANL	02206	32	ANL	43228
2		02103	33		10099
3		38513	34		39379
4		10085	35		10196
5		38094	36		40092
6		02221	37		57
7		39412	38		05104
8		09819	39		40667
9		38535	40		10138
10		08281	41		38117
11		37619	42		08478
12		05276	43		39820
13		02211	44		05149
14		01895	45		39499
15		37507	46		10181
16		10135	47		39807
17		33675	48		09691
18		08476	49		82
19		01959	50		05288
20		05424	51		41159
21		01913	52		10155
22		09444	53		38949
23		39988	54		10247
24		08393	55		38183
25		45	56		05281
26		05094	57		38519
27		10272	58		09501
28		38200	59		40522
29		02058	60		07593
30		40007	61		90
31	Y	05296		Y	

Note: All elements contain Mark-IA driver fuel.

Subassembly No. X083A
 Type Hardware: ME-E-61A
 Orifice: No. of Holes 7; Dia. of Holes 0.250
 Lower Adapter Modifications: None
 Flow Test Date: ~ 53 gpm in row 5 @ 45 psi
 Date Assembled: 4/14/72; Location HFEF
 Date Loaded in Reactor: 6/26/72; for Run 56
 Initial Grid Position: 6E2

Position	Sponsor	Ident. No.	Comments
1	GGA	G-1	From X094
2	GGA	G-2	From X094
3	GGA	G-8	Unirradiated Capsule
4	GGA	G-5	From X094, No Spacer Wire
5	GGA	G-4	From X094
6	GGA	G-6	From X094
7	GGA	G-7	From X094

Subassembly No. X094A

Type Hardware: MK-B-7B

Orifice: No. of Holes 2 0.311
(In series) 1; Dia. of Holes 0.440

Lower Adapter Modifications: None

Flow Test Data: ~17.5 gpm in row 7

Date Assembled: 4/24/72; Location HFEF

Date Loaded in Reactor: 5/21/72; for Run 56

Initial Grid Position: 7C1

Pos.	Sponsor	Ident. No.	Pos.	Sponsor	Ident. No.
1	HEDL	N-084	32	HEDL	N-077
2		-064	33		-124
3		-016	34		-053
4		-042	35		-040
5		-004	36		-170
6		-096	37		-164
7		-156	38		-125
8		-108	39		-190
9		-071	40		-179
10		-015	41		-107
11		-010	42		-007
12		-118	43		-043
13		-041	44		-173
14		-067	45		-141
15		-029	46		-023
16		-054	47		-178
17		-021	48		-095
18		-052	49		-076
19		-140	50		-062
20		-188	51		-183
21		-151	52		-143
22		-086	53		-148
23		-068	54		-200
24		-049	55		-121
25		-047	56		-080
26		-017	57		-191
27		-168	58		-145
28		-166	59		-136
29		-196	60		-111
30		-122	61		-090
31		-089			

Subassembly No. X096 (NUMEC-E)

Type Hardware: MK-B-61A

Orifice: No. of Holes 7; Dia. of Holes 0.329

Lower Adapter Modifications: None

Flow Test Data: 68 gpm in row 4

Date Assembled: 11/23/71; Location ITF

Date Loaded in Reactor: 12/5/71; for Run 53

Initial Grid Position: 4C1

Note:
All elements contain UO₂-25 wt % PuO₂ fuel;
uranium 77% enriched.

Position	Sponsor	Ident. No.	Comments
1	GE	LP4C	Structural
2	GE	LP2L	Structural
3	GE	LP2GA	Structural
4	GE	LP2R	Structural
5	GE	LP2JA	Structural
6	GE	LP2G	Structural
7	GE	LP2C	Structural
8	GE	LP2P	Structural
9	GE	LP2FA	Structural
10	GE	LP2EA	Structural
11	GE	LP2HA	Structural
12	GE	LP2A	Structural
13	GE	LP2DA	Structural
14	GE	LP2CA	Structural
15	GE	LP2E	Structural
16	GE	LP2AA	Structural
17	GE	LP2I	Structural
18	GE	LP2K	Structural
19	GE	LP2BA	Structural

Subassembly No. X098A

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 ; Dia. of Holes 0.318
(In series) 2 ; Dia. of Holes 0.229

Lower Adapter Modifications: None

Flow Test Data: ~12 gpm in row 4

Date Assembled: 6/29/72 ; Location HFEP

Date Loaded in Reactor: 7/1/72 ; for Run 56A

Initial Grid Position: 4A3

Position	Sponsor	Ident. No.	Comments
1	ORNL	0-7	Boron Carbide
2	ORNL	0-16	Boron Carbide
3	ORNL	0-14	Boron Carbide
4	ORNL	0-15	Boron Carbide
5	ORNL	0-17	Boron Carbide
6	ORNL	0-6	Boron Carbide
7	ORNL	0-8	Boron Carbide

Note: Dosimetry capsule EX099AD0S located within subassembly, at grid-plate elevation.

Subassembly No. X099A

Type Hardware: ME-B-7A

Orifice: No. of Holes 3 ; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~6 gpm in row 8

Date Assembled: 10/19/72 ; Location HFEF

Date Loaded in Reactor: 10/23/72 ; for Run 59B

Initial Grid Position: 8D4

Position	Sponsor	Ident. No.	Comments
1	ORNL	0-7	Boron Carbide
2	ORNL	0-16	Boron Carbide
3	ORNL	0-14	Boron Carbide
4	ORNL	0-15	Boron Carbide
5	ORNL	0-17	Boron Carbide
6	ORNL	0-6	Boron Carbide
7	ORNL	0-8	Boron Carbide

Subassembly No. X099B

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~6 gpm in row 8

Date Assembled: 1/9/73; Location HFEF

Date Loaded in Reactor: 1/13/73; for Run 61A

Initial Grid Position: 8D4

Position	Sponsor	Ident. No.	Comments
1	ORNL	OE-3	Structural
2	ORNL	OG-3	Structural
3	ORNL	OT-3	Structural
4	ORNL	OD-3	Structural
5	ORNL	OF-3	Structural
6	ORNL	OS-3	Structural
7	ORNL	OC-3	Structural

Subassembly No. X100A

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~12 gpm in row 2

Date Assembled: 6/23/72; Location HFEF

Date Loaded in Reactor: 6/27/72; for Run 56A

Initial Grid Position: 2D1

Position	Sponsor	Ident. No.	Comments
1	ANL	EA-2	Structural
2	ANL	EA-98	Structural
3	ANL	EA-72	Structural
4	ANL	EA-25	Structural
5	ANL	EA-100	Structural
6	ANL	EA-75	Structural
7	ANL	EA-5	Structural
8	ANL	EA-62	Structural
9	ANL	EA-103	Structural
10	ANL	EA-79	Structural
11	ANL	EA-23	Structural
12	ANL	EA-48	Structural
13	ANL	EA-943	Structural
14	ANL	EA-27	Structural
15	ANL	EA-106	Structural
16	ANL	EA-12	Structural
17	ANL	EA-49	Structural
18	ANL	EA-322	Structural
19	ANL	EA-30	Structural
20	ANL	EA-101	Structural
21	ANL	EA-65	Structural
22	ANL	EA-21	Structural
23	ANL	EA-83	Structural
24	ANL	EA-16	Structural
25	ANL	EA-45	Structural
26	ANL	EA-86	Structural
27	ANL	EA-18	Structural
28	ANL	EA-76	Structural
29	ANL	EA-69	Structural
30	ANL	EA-102	Structural
31	ANL	EA-9	Structural
32	ANL	EA-74	Structural
33	ANL	EA-601	Structural
34	ANL	EA-15	Structural
35	ANL	EA-41	Structural
36	ANL	EA-945	Structural
37	ANL	EA-29	Structural

Subassembly No. X101A

Type Hardware: MK-L-37

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~14 gpm in row 7

Date Assembled: 9/29/71; Location HFEF

Date Loaded in Reactor: 10/18/71; for Run 52A

Initial Grid Position: 7B3

Position	Sponsor	Ident. No.	Comments
1	ANL	EA-2	Structural
2	ANL	EA-98	Structural
3	ANL	EA-72	Structural
4	ANL	EA-25	Structural
5	ANL	EA-100	Structural
6	ANL	EA-75	Structural
7	ANL	EA-5	Structural
8	ANL	EA-62	Structural
9	ANL	EA-103	Structural
10	ANL	EA-79	Structural
11	ANL	EA-23	Structural
12	ANL	EA-48	Structural
13	ANL	EA-943	Structural
14	ANL	EA-27	Structural
15	ANL	EA-106	Structural
16	ANL	EA-12	Structural
17	ANL	EA-49	Structural
18	ANL	EA-322	Structural
19	ANL	EA-30	Structural
20	ANL	EA-101	Structural
21	ANL	EA-65	Structural
22	ANL	EA-21	Structural
23	ANL	EA-83	Structural
24	ANL	EA-16	Structural
25	ANL	EA-45	Structural
26	ANL	EA-86	Structural
27	ANL	EA-18	Structural
28	ANL	EA-76	Structural
29	ANL	EA-69	Structural
30	ANL	EA-102	Structural
31	ANL	EA-9	Structural
32	ANL	EA-74	Structural
33	ANL	EA-601	Structural
34	ANL	EA-15	Structural
35	ANL	EA-41	Structural
36	ANL	EA-945	Structural
37	ANL	EA-29	Structural

Subassembly No. X101B

Type Hardware: HK-1-37

Orifice: No. of Holes 3 ; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~14 gpm in row 7

Date Assembled: 3/9/72 ; Location HFEF

Date Loaded in Reactor: 3/11/72 ; for Run 55A

Initial Grid Position: 7B3

Position	Sponsor	Ident. No.	Comments
1	ANL	EA-2	Structural
2	ANL	EA-100	Structural
3	ANL	EA-79	Structural
4	ANL	EA-12	Structural
5	ANL	EA-98	Structural
6	ANL	EA-75	Structural
7	ANL	EA-23	Structural
8	ANL	EA-49	Structural
9	ANL	EA-83	Structural
10	ANL	EA-72	Structural
11	ANL	EA-5	Structural
12	ANL	EA-48	Structural
13	ANL	EA-322	Structural
14	ANL	EA-16	Structural
15	ANL	EA-69	Structural
16	ANL	EA-25	Structural
17	ANL	EA-62	Structural
18	ANL	EA-943	Structural
19	ANL	EA-30	Structural
20	ANL	EA-45	Structural
21	ANL	EA-102	Structural
22	ANL	EA-15	Structural
23	ANL	EA-103	Structural
24	ANL	EA-27	Structural
25	ANL	EA-101	Structural
26	ANL	EA-86	Structural
27	ANL	EA-9	Structural
28	ANL	EA-41	Structural
29	ANL	EA-106	Structural
30	ANL	EA-65	Structural
31	ANL	EA-18	Structural
32	ANL	EA-74	Structural
33	ANL	EA-945	Structural
34	ANL	EA-21	Structural
35	ANL	EA-76	Structural
36	ANL	EA-601	Structural
37	ANL	EA-29	Structural

Subassembly No. X101C

Type Hardware: NE-1-37A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~ 14 gpm in row 7

Date Assembled: 5/31/72; Location HFFP

Date Loaded in Reactor: 6/25/72; for Run 56A

Initial Grid Position: 7B5

Subassembly No. X107A (PNL-11 Oxide Fuel Elements)

Type Hardware: PK-B-61A

Orifice: No. of Holes 7; Dia. of Holes 0.375

Lower Adapter Modifications: None

Flow Test Data: 90 gpm in row 3

Date Assembled: 8/27/71; Location HFEF

Date Loaded in Reactor: 9/11/71; for Run 51B

Initial Grid Position: 3D2

Pos.	Sponsor	Ident.	Pos.	Sponsor	Ident.
1	HEDL	11-1R	32	HEDL	11-32
2		2	33		73
3		62	34		34
4		4R	35		35
5		5	36		75
6		6	37		37
7		7	38		38
8		8R	39		39
9		9R	40		40R
10		10R	41		41
11		63	42		76
12		12	43		43
13		13	44		44
14		14	45		45R
15		15	46		78
16		16R	47		47
17		17	48		48A
18		18	49		49
19		19	50		50
20		20R	51		51
21		21	52		52
22		70R	53		53
23		23	54		54
24		64	55		55
25		65	56		56
26		74R	57		57
27		69	58		58
28		28	59		59A
29		29	60		60
30		71	61		61
31		31R			

Notes:

1. UO₂-25 wt % PuO₂ fuel; uranium 65% enriched.
2. Elements 31R, 35, 69, 70R, 74R, and 75 are unirradiated; the remaining 55 elements continue from X107.
3. Elements 63, 64, 65, 69, 71, 73, 76, 78, 48A, and 59A have wire wrap attached 180° out of phase with wire wrap on other elements.

Subassembly No. X107B (PNL-11 Oxide Fuel Elements)

Type Hardware: MK-B-61A

Orifice: No. of Holes 7 ; Dia. of Holes 0.312

Lower Adapter Modifications: None

Flow Test Data: ~81 gpm in row 3

Date Assembled: 9/9/72 ; Location HFEF

Date Loaded in Reactor: 9/10/72 ; for Run 58

Initial Grid Position: 3D2

Pos.	Sponsor	Ident. No.	Pos.	Sponsor	Ident. No.
1	HEDL	11-1R	32	HEDL	11-32
2		2	33		73
3		62	34		34
4		4R	35		35
5		5	36		75
6		6	37		37
7		7	38		38
8		8R	39		39
9		9R	40		40R
10		10R	41		41
11		63	42		76
12		3R	43		43
13		13	44		44
14		14	45		45R
15		15	46		78
16		16R	47		47
17		17	48		48A
18		18	49		49
19		19	50		50
20		24R	51		51
21		21	52		52
22		70R	53		53
23		23	54		54
24		64	55		55
25		65	56		56
26		74R	57		57
27		69	58		58
28		28	59		59A
29		29	60		60
30		71	61		61
31		31R			

Notes:

1. UO_2 -25 wt % PuO_2 fuel; uranium 65% enriched.
2. Elements 3R and 24R are unirradiated; the remaining 59 elements continue from X107A.
3. Elements 63, 64, 65, 69, 71, 73, 76, 78, 48A, and 59A have wire wrap attached 180° out of phase with wire wrap on other elements.

Position	Sponsor	Ident. No.	Comments
1		Dummy	
2		Dummy	
3		Dummy	
4		Dummy	
5		Dummy	
6		Dummy	
7		Dummy	
8		Dummy	
9		Dummy	
10	ANC	I-11-2A	Fission-Product Cross Section
11		Dummy	
12		Dummy	
13		Dummy	
14		Dummy	
15		Dummy	
16		Dummy	
17		Dummy	
18		Dummy	
19		Dummy	

Subassembly No. X109

Type Hardware: MK-B-19

Orifice: No. of Holes 1 3; Dia. of Holes 0.375
(In series) 0.216

Lower Adapter Modifications: None

Flow Test Data: ~ 17 gpm in row 7

Date Assembled: 9/16/71; Location ITF

Date Loaded in Reactor: 9/19/71; for Run 51C

Initial Grid Position: 7C3

Position	Sponsor	Ident. No.	Comments
1	HEDL/ANL	PNL 5-60	Unirradiated
2		PNL 5-50	
3		PNL 5-30	
4		PNL 5-24	
5		PNL 5-29	
6		PNL 5-37	
7		PNL 5-61	
8		P5X-7	Unirradiated
9		PNL 5-70	
10		PNL 5-8	Unirradiated
11		PNL 5-36	
12		PNL 5-3	
13		PNL 5-12	
14		P5X-12	Unirradiated
15		PNL 5-15	
16		PNL 5-4	
17		PNL 5-13	
18		PNL 5-17	
19		P5X-13	Unirradiated

Subassembly No. X116A (PNL-5)

Type Hardware: MK-E-19D

Orifice: No. of Holes 7; Dia. of Holes 0.250

Lower Adapter Modifications: None

Flow Test Data: ~40 gpm in row 6

Date Assembled: 6/9/72; Location HFEF

Date Loaded in Reactor: 6/26/72; for Run 56

Initial Grid Position: 6B1

Notes:

1. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.
2. Irradiated elements are from X116.

Position	Sponsor	Ident. No.	Comments
1		Dummy	
2		Dummy	
3		Dummy	
4	GE	F8B-16	Oxide Fuel
5	GE	F8B-11	Oxide Fuel
6		Dummy	
7		Dummy	
8		Dummy	
9	GE	F8B-10	Oxide Fuel
10	GE	F8B-3	Oxide Fuel
11		Dummy	
12		Dummy	
13	GE	F8B-4	Oxide Fuel
14	GE	F8B-14	Oxide Fuel
15	GE	F8B-15	Oxide Fuel
16		Dummy	
17	GE	F8B-7	Oxide Fuel
18	GE	F8B-17	Oxide Fuel
19		Dummy	

Subassembly No. X117A (GE F8B) _____

Type Hardware: MK-A-19 _____

Orifice: No. of Holes 1; Dia. of Holes 0.750

Lower Adapter Modifications: None _____

Flow Test Data: ~20 gpm in row 9 @ 9.3 psi

Date Assembled: 8/2/72; Location HFEF _____

Date Loaded in Reactor: 9/10/72; for Run 58 _____

Initial Grid Position: 9C8 _____

Note:

UO₂-25 wt % PuO₂ fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	BMI	3-4	Nitride Fuel
2	ORNL	S1D	Oxide Fuel
3	LASL	K46	Carbide Fuel
4	BMI	3-3	Nitride Fuel
5	ORNL	S1B	Oxide Fuel
6	LASL	K45	Carbide Fuel
7	WARD	W12F	Carbide Fuel
8	BMI	3-2	Nitride Fuel
9	ORNL	S1C	Oxide Fuel
10	BMI	3-8	Nitride Fuel
11	WARD	W6F	Carbide Fuel
12	LASL	K51	(97% enriched) Carbide Fuel
13	BMI	3-5	Nitride Fuel
14	BMI	3-7	Nitride Fuel
15	WARD	W5F	Carbide Fuel
16	LASL	K50	(97% enriched) Carbide Fuel
17	BMI	3-6	Nitride Fuel
18	WARD	W8F	Carbide Fuel
19	LASL	K49	(97% enriched) Carbide Fuel

Subassembly No. X119B

Type Hardware: MX-A-19A

Orifice: No. of Holes 7; Dia. of Holes 0.250

Lower Adapter Modifications: None

Flow Test Data: 49 gpm in row 5

Date Assembled: 6/2/72; Location HFEF

Date Loaded in Reactor: 6/25/72; for Run 56

Initial Grid Position: 5A4

Note:

BMI fuel is $(U_{0.80} - Pu_{0.20})N$, WARD and LASL fuel $(U_{0.80} - Pu_{0.20})C$, and ORNL fuel $(U_{0.80} - Pu_{0.20})O_2$. Except where indicated, enrichment is 93%.

Position	Sponsor	Ident. No.	Comments
1	HEDL	BCM-1-6	Boron Carbide
2	HEDL	BCM-1-9	Boron Carbide
3	HEDL	BCM-1-3	Boron Carbide
4	HEDL	BCM-1-TA	Tantalum
5	HEDL	BCM-1-1	Boron Carbide
6	HEDL	BCM-1-7	Boron Carbide
7	HEDL	BCM-1-4	Boron Carbide

Note: Orientation of index hole on boron carbide capsules indicated by "X".

Subassembly No. X120A

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~14 gpm in row 7

Date Assembled: 9/9/71; Location HFEF

Date Loaded in Reactor: 9/11/71; for Run 51B

Initial Grid Position: 7B3

Position	Sponsor	GE Ident. No.	ANL Ident. No.
1	GE	F10A - 04	ANL - 37
2		- 09	- 30
3		- 10	- 27
4		- 06	- 28
5		- 13	- 38
6		- 02	- 33
7		- 19	- 26
8		- 05	- 22
9		- 11	- 34
10		- 01	- 36
11		- 17	- 35
12		- 18	- 24
13		- 15	- 23
14		- 12	- 29
15		- 16	- 25
16		- 08	- 31
17		- 14	- 20
18		- 03	- 32
19		- 07	- 21

3. The 12 outer capsules have triangular flow restrictors attached.

Subassembly No. X121 (GE F10A)

Type Hardware: MK-J-19

Orifice: No. of Holes See Note 1; Dia. of Holes _____

Lower Adapter Modifications: None

Flow Test Data: 38 total
20 int. gpm in row 6

Date Assembled: 1/7/72; Location ITF

Date Loaded in Reactor: 2/2/72; for Run 54A

Initial Grid Position: 6D3

Notes:

Main orifice plate per EB-1-51168, with 7 holes of 0.250 in. dia. Flow divider per EB-1-50481, with 6 holes of 0.125 in. dia. Lower shield per EB-1-50480, with 6 holes of 0.187 in. dia.

2. Capsules contain UO_2 -25 wt % PuO_2 fuel; uranium 91% enriched.

Position	Sponsor	GE Ident. No.	ANL Ident. No.
1	GE	F10B - 11	ANL - 03
2		- 03	11
3		- 15	17
4		- 12	19
5		- 21	07
6		- 22	14
7		- 16	15
8		- 20	02
9		- 24	09
10		- 13	10
11		- 25	01
12		- 09	06
13		- 23	13
14		- 17	12
15		- 14	16
16		- 10	04
17		- 04	08
18		- 02	18
19		- 01	05

3. The 12 outer capsules have triangular flow restrictors attached.

Subassembly No. X122 (GE F10B)

Type Hardware: MK-I-19

See
Orifice: No. of Holes Note 1; Dia. of Holes _____

Lower Adapter Modifications: None

~38 total
Flow Test Data: ~20 int. gpm in row 6

Date Assembled: 12/1/71; Location ITF

Date Loaded in Reactor: 12/5/71; for Run 53

Initial Grid Position: 6D4

Notes:

1. Main orifice plate per EB-1-51168, with 7 holes of 0.250 in. dia. Flow divider per EB-1-50481, with 6 holes of 0.125 in. dia. Lower shield per EB-1-50480, with 6 holes of 0.187 in. dia.
2. Capsules contain UO_2 -25 wt % PuO_2 fuel; uranium 91% enriched.

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	HEDL	B66	Structural

Subassembly No. X124
 Type Hardware: MK-M-1A
 Orifice: No. of Holes 3; Dia. of Holes 0.162
 Lower Adapter Modifications: None
 Flow Test Data: 12.7 gpm in row 2
 Date Assembled: 10/21/71; Location ITF
 Date Loaded in Reactor: 10/28/71; for Rm 52B
 Initial Grid Position: 2B1

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	HEDL	B66	Structural

Subassembly No. X124A

Type Hardware: MK-M-1A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications None

Flow Test Data: ~13 gpm in row 2

Date Assembled: 6/30/72; Location HFEF

Date Loaded in Reactor: 7/1/72; for Run 56A

Initial Grid Position: 2B1

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Position	Sponsor	Ident. No.	Comments
1	ANL	EA-4	Structural
2	ANL	EA-93	Structural
3	ANL	EA-59	Structural
4	ANL	EA-88	Structural
5	ANL	EA-53	Structural
6	ANL	EA-104	Structural
7	ANL	EA-7	Structural
8	ANL	EA-47	Structural
9	ANL	EA-40	Structural
10	ANL	EA-43	Structural
11	ANL	EA-26	Structural
12	ANL	EA-57	Structural
13	ANL	EA-67	Structural
14	ANL	EA-32	Structural
15	ANL	EA-60	Structural
16	ANL	EA-20	Structural
17	ANL	EA-94	Structural
18	ANL	EA-87	Structural
19	ANL	EA-107	Structural
20	ANL	EA-99	Structural
21	ANL	EA-78	Structural
22	ANL	EA-85	Structural
23	ANL	EA-52	Structural
24	ANL	EA-6	Structural
25	ANL	EA-55	Structural
26	ANL	EA-105	Structural
27	ANL	EA-19	Structural
28	ANL	EA-89	Structural
29	ANL	EA-58	Structural
30	ANL	EA-81	Structural
31	ANL	EA-24	Structural
32	ANL	EA-54	Structural
33	ANL	EA-46	Structural
34	ANL	EA-35	Structural
35	ANL	EA-44	Structural
36	ANL	EA-37	Structural
37	ANL	EA-14	Structural

Subassembly No. X133A

Type Hardware: MK-L-37

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~13 gpm in row 7

Date Assembled: 1/3/72; Location HFEF

Date Loaded in Reactor: 2/2/72; for Run 54A

Initial Grid Position: 7B3

Position	Sponsor	Ident. No.	Comments
1	ANL	EA-4	Structural
2	ANL	EA-93	Structural
3	ANL	EA-59	Structural
4	ANL	EA-88	Structural
5	ANL	EA-53	Structural
6	ANL	EA-104	Structural
7	ANL	EA-7	Structural
8	ANL	EA-47	Structural
9	ANL	EA-40	Structural
10	ANL	EA-43	Structural
11	ANL	EA-26	Structural
12	ANL	EA-57	Structural
13	ANL	EA-67	Structural
14	ANL	EA-32	Structural
15	ANL	EA-60	Structural
16	ANL	EA-20	Structural
17	ANL	EA-94	Structural
18	ANL	EA-87	Structural
19	ANL	EA-107	Structural
20	ANL	EA-99	Structural
21	ANL	EA-78	Structural
22	ANL	EA-85	Structural
23	ANL	EA-52	Structural
24	ANL	EA-6	Structural
25	ANL	EA-55	Structural
26	ANL	EA-105	Structural
27	ANL	EA-19	Structural
28	ANL	EA-89	Structural
29	ANL	EA-58	Structural
30	ANL	EA-81	Structural
31	ANL	EA-24	Structural
32	ANL	EA-54	Structural
33	ANL	EA-46	Structural
34	ANL	EA-35	Structural
35	ANL	EA-44	Structural
36	ANL	EA-37	Structural
37	ANL	EA-14	Structural

Subassembly No. X133B

Type Hardware: MK-L-37A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~13 gpm in row 7

Date Assembled: 5/31/72; Location HFEF

Date Loaded in Reactor: 6/25/72; for Run 56A

Initial Grid Position: 7B3

Position	Sponsor	Ident. No.	Comments
1	ANL	EA-4	Structural
2	ANL	EA-93	Structural
3	ANL	EA-59	Structural
4	ANL	EA-88	Structural
5	ANL	EA-53	Structural
6	ANL	EA-104	Structural
7	ANL	EA-7	Structural
8	ANL	EA-47	Structural
9	ANL	EA-40	Structural
10	ANL	EA-43	Structural
11	ANL	EA-26	Structural
12	ANL	EA-57	Structural
13	ANL	EA-67	Structural
14	ANL	EA-32	Structural
15	ANL	EA-60	Structural
16	ANL	EA-20	Structural
17	ANL	EA-94	Structural
18	ANL	EA-87	Structural
19	ANL	EA-107	Structural
20	ANL	EA-99	Structural
21	ANL	EA-78	Structural
22	ANL	EA-85	Structural
23	ANL	EA-52	Structural
24	ANL	EA-6	Structural
25	ANL	EA-55	Structural
26	ANL	EA-105	Structural
27	ANL	EA-19	Structural
28	ANL	EA-89	Structural
29	ANL	EA-58	Structural
30	ANL	EA-81	Structural
31	ANL	EA-24	Structural
32	ANL	EA-54	Structural
33	ANL	EA-46	Structural
34	ANL	EA-35	Structural
35	ANL	EA-44	Structural
36	ANL	EA-37	Structural
37	ANL	EA-14	Structural

Subassembly No. X133C

Type Hardware: MK-L-37A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~ 13 gpm in row 7

Date Assembled: 12/27/72; Location HFEE

Date Loaded in Reactor: 1/13/73; for Run 61A

Initial Grid Position: 7B3

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	ANL	ER-1	Corrosion Specimens

Note: Three holes 1/8 in. diameter for bypass flow. Two orifice plates in series for test section of S/A; each plate has 3 holes 1/8 in. dia.

Subassembly No. X134

Type of Hardware: MK-K-1

Orifice: No. of Holes: See Note; Dia. of Holes

Lower Adapter Modifications: None

Flow Test Data: 8.3 gpm in row 7

Date Assembled: 8/31/71; Location ITF

Date Loaded in Reactor: 9/11/71; for Run 51B

Initial Grid Position: 7E3

Note:

Eleven capsules, identified as EH11, EH12, EH13, EH14, EH32, EH33, EH34, EH41, EH42, EH43, and EH44, were located in the modified upper and lower triflute reflectors of this subassembly. Each capsule contained xenon-tag-burnout capsules and dosimetry capsules.

Subassembly No. X135

Type Hardware: Standard Core Driver

NO ORIFICE IN STANDARD CORE DRIVER

Lower Adapter Modifications: None

FLOW TEST WAIVED

Date Assembled: 8/20/71; Location ITF

Date Loaded in Reactor: 8/24/71; for Run 51A

Initial Grid Position: 4F1

Position	Sponsor	Ident. No.	Comments
1	LASL	K-3	Thermionic Insulator
2	LASL	K-4	Thermionic Insulator
3		Dummy	
4	ORNL	O-11	Tungsten
5		Dummy	
6		Dummy	
7		Dummy	

Subassembly No. X136

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 13.5 gpm in row 7

Date Assembled: 9/15/71; Location ITF

Date Loaded in Reactor: 9/19/71; for Run 51C

Initial Grid Position: 7C1

Position	Sponsor	Ident. No.	Comments
1	HEDL	B86	Structural
2	HEDL	B88	Structural
3	HEDL	B89	Structural
4	HEDL	B87	Structural
5	HEDL	B90	Structural
6	HEDL	B84	Structural
7	HEDL	B85	Structural

Subassembly No. X137

Type Hardware: MK-B-7A

Orifice: No. of Holes 3 ; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 13.5 gpm in row 4

Date Assembled: 8/18/71 ; Location ITF

Date Loaded in Reactor: 8/24/71 ; for Run 51A

Initial Grid Position: 4D3

Position	Sponsor	Ident. No.	Comments
1	HEPL	P23A - 1	
2		2	
3		3	
4		4	
5		5	
6		57A	SiC Temp Monitor
7		7	
8		8	
9		9	
10		10	
11		11	
12		58B	SiC Temp Monitor
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		59C	SiC Temp Monitor
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		28R	
29		29	
30		30	
31		31	
32		32	
33		33	
34		34	
35		35	
36		36	
37		37	

Subassembly No. X138

Type Hardware: MK-J-37A

Orifice: No. of Holes 7; Dia. of Holes 0.242

Lower Adapter Modifications: 6 shield holes 9/32 dia.

Flow Test Data: 59 gpm in row 3 (~50% bypass)

Date Assembled: 1/18/72; Location ITF

Date Loaded in Reactor: 2/2/72; for Run 54

Initial Grid Position: 3B2

Notes:

1. Upper orifice plate per EB-1-50778 Rev. A, with 7 holes of 7/32 in. dia.
2. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 65% enriched.

Position	Sponsor	Ident. No.	Comments
1	HEDL	P23A - 1	
2		2	
3		3	
4		4	
5		5	
6		60D	SiC Temp Monitor
7		7	
8		8	
9		9	
10		10	
11		11	
12		62F	SiC Temp Monitor
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		43	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		26	
27		27	
28		38	
29		29	
30		30	
31		31	
32		32	
33		33	
34		34	
35		44	
36		36	
37		37	

Subassembly No. X138A

Type Hardware: MK-J-37A

Orifice: No. of Holes 7; Dia. of Holes 0.235

Lower Adapter Modifications: 6 shield holes 9/32 dia.

Flow Test Data: ~ 56 gpm in row 3 (~50% bypass) at 43 psi

Date Assembled: 6/26/72; Location HFEF

Date Loaded in Reactor: 7/1/72; for Run 56

Initial Grid Position: 3E2

Notes:

1. Upper orifice plate per EB-1-50778 Rev. A, with 7 holes of 7/32 in. dia.
2. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 65% enriched. Elements 38, 43, 44, 60D, and 62F are unirradiated; the remainder continue from X138.

Position	Sponsor	Ident. No.	Comments
1	HEPL	P23A - 1	
2		2	
3		3	
4		4	
5		5	
6		6	
7		7	
8		8	
9		9	
10		10	
11		11	
12		63G	SiC Temp Monitor
13		13	
14		14	
15		15	
16		16	
17		17	
18		18	
19		43	
20		20	
21		21	
22		22	
23		23	
24		24	
25		25	
26		12	
27		38	
28		53	
29		29	
30		30	
31		44	
32		19	
33		33	
34		34	
35		49	
36		36	
37		37	

Subassembly No. X138B

Type Hardware: MK-J-37A

Orifice: No. of Holes 7; Dia. of Holes 0.235

Lower Adapter Modifications: 6 shield holes 9/32 dia.

Flow Test Data: ~56 gpm in row 3 at 43 psi; equivalent to ~28 gpm internal flow.

Date Assembled: 11/30/72; Location HFEF

Date Loaded in Reactor: 12/10/72; for Run 60

Initial Grid Position: 3E2

Notes:

1. Upper orifice plate per EB-1-50778, with 7 holes of 7/32 in. dia.
2. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 65% enriched. Elements 6, 12, 19, 49, 53 and 63G are unirradiated; the remainder continue from X138A.

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	NRL	H-2	Structural

Subassembly No. X139

Type Hardware: MK-M-1

Orifice: No. of Holes 2; Dia. of Holes 0.0995
(In each of three plates in series)

Lower Adapter Modifications: None

Flow Test Data: 1.98 gpm in row 7

Date Assembled: 8/2/71; Location ITF

Date Loaded in Reactor: 8/24/71; for Run 51A

Initial Grid Position: 7A5

Position	Sponsor	Ident. No.	Comments
1	HEDL	BMV-1-6	Boron Carbide
2	HEDL	BMV-1-1	Boron Carbide
3	HEDL	BMV-1-5	Boron Carbide
4	HEDL	BMV-1-7R	Boron Carbide
5	HEDL	BMV-1-2	Boron Carbide
6	HEDL	BMV-1-4	Boron Carbide
7	HEDL	BMV-1-3	Boron Carbide

Note: Orientation of index hole on capsules indicated by "X".

Subassembly No. X140

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 14.7 gpm in row 4

Date Assembled: 8/19/71; Location ITF

Date Loaded in Reactor: 9/19/71; for Run 51C

Initial Grid Position: 4B2

Position	Sponsor	Ident. No.	Comments
1	HEDL	BMV-1-8	Boron Carbide
2	HEDL	BMV-1-1	Boron Carbide
3	HEDL	BMV-1-5	Boron Carbide
4	HEDL	BMV-1-9	Boron Carbide
5	HEDL	BMV-1-2	Boron Carbide
6	HEDL	BMV-1-4	Boron Carbide
7	HEDL	BMV-1-10	Boron Carbide

Note: Orientation of index hole on capsules indicated by "X".

Subassembly No. X140A

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~15 gpm in row 4

Date Assembled: 2/25/72; Location HFEF

Date Loaded in Reactor: 3/14/72; for Run 55A

Initial Grid Position: 4B2

Position	Sponsor	Ident. No.	Comments
1	GE	F11A-09	
2		-21	
3		-10	
4		-07	Irregular Wire
5		-20	
6		-13	
7		-34	
8		-40	
9		-24	
10		-19	
11		-35	
12		-41	
13		-15	
14		-37	
15		-25	
16		-27	
17		-18	
18		-14	
19		-16	
20		-39	
21		-02	
22		-03	
23		-28	
24		-17	
25		-38	
26		-12	Irregular Wire
27		-04	
28		-22	
29		-29	
30		-11	
31		-36	
32		-30	Wire Reversed
33		-23	
34		-05	
35		-01	
36		-26	
37		-06	

Subassembly No. X141

Type Hardware: MK-J-37A

Orifice: No. of Holes None; Dia. of Holes _____

Lower Adapter Modifications: None

Flow Test Data: 67 gpm in row 6 @ 43.5 psi; equivalent to ~41.6 gpm internal flow.

Date Assembled: 12/5/72; Location FASB

Date Loaded in Reactor: 12/10/72; for Run 60

Initial Grid Position: 6E4

Notes:

1. All elements contain UO_2 -25 wt % PuO_2 ; uranium 92% enriched.
2. Shield per EB-1-50779, with six holes of 0.281 in. dia.

Position	Sponsor	Ident. No.	Comments
1	HEDL	PNL 2-5	From X032
2	HEDL	PNL 2-13	From X032
3	LASL	K-36B	From X070
4	UNC	88	(U _{0.80} - Pu _{0.20})C Unirradiated
5	UNC	186	Unirradiated
6	UNC	185	Unirradiated
7	UNC	105	From X075
8	UNC	202	Unirradiated
9	UNC	203	Unirradiated
10	UNC	205	Unirradiated
11	UNC	204	Unirradiated
12	UNC	113	From X075
13	UNC	114	From X075
14	UNC	97	From X075
15	UNC	106	From X075
16	UNC	93	From X075
17	UNC	110	From X075
18	UNC	94	From X075
19	UNC	98	From X075

Subassembly No. X142

Type Hardware: MK-A-19A

Orifice: No. of Holes 7; Dia. of Holes 0.292

Lower Adapter Modifications: None

Flow Test Data: ~ 50 gpm in row 6

Date Assembled: 10/8/71; Location HFEF

Date Loaded in Reactor: 10/18/71; for Run 52

Initial Grid Position: 6F3

NOTE:

Except where indicated, HEDL fuel is UO₂-25 wt % PuO₂, LASL fuel is (U_{0.80} - Pu_{0.20})C, and UNC fuel is (U_{0.85} - Pu_{0.15})C. Uranium is 93% enriched in all.

Position	Sponsor	Ident. No.	Comments
1	GE	F9C-1	
2		-24	
3		-32	
4		-21	
5		-18	
6		-20	
7		-23	
8		-5	
9		-9	
10		-27	
11		-11	
12		-30	
13		-10	
14		-26	
15		-4	
16		-38	
17		F9A-46	Unirradiated
18		F9A-43	Unirradiated
19		F9C-25	

Subassembly No. X143 (F9C-1)

Type Hardware: MK-E-19D

Orifice: No. of Holes 7; Dia. of Holes 0.206

Lower Adapter Modifications: None

Flow Test Data: ~ 35 gpm in row 6

Date Assembled: 1/19/72; Location HFEF

Date Loaded in Reactor: 2/2/72; for Run 54

Initial Grid Position: 6A2

Notes:

1. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.
2. Irradiated elements are from X056.

Position	Sponsor	Ident. No.	Comments
1	GE	F9C-30M	
2		F9C-38C	
3		F9C-25M	
4		F9C-23M	Modified End Plug
5		F9C-11C	
6		F9C-4C	
7		F9A-43	
8		F9C-32M	Modified End Plug
9		F9C-20M	
10		F9C-27C	
11		F9C-26C	Modified End Plug
12		F9A-46	
13		F9C-24M	
14		F9C-18M	
15		F9C-9C	
16		F9C-10C	
17		F9C-1C	Modified End Plug
18		F9C-21M	
19		F9C-5C	

Subassembly No. X143A (F9C-1)

Type Hardware: MK-E-19G

Orifice: No. of Holes 7; Dia. of Holes 0.206

Lower Adapter Modifications: None

Flow Test Data: 33.4 gpm in row 6 at 45.3 psi

Date Assembled: 1/10/73; Location HFEF

Date Loaded in Reactor: 1/13/73; for Run 61

Initial Grid Position: 6E1

Note:

All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	GE	F9C-36	
2		-35	
3		-33	
4		-34	
5		-37	
6		-17	
7		-22	
8		-29	
9		-16	
10		-14	
11		-15	
12		F9A-45	Unirradiated
13		-2	
14		-8	
15		-12	
16		-19	
17		-3	
18		-6	
19		F9A-44	Unirradiated

Subassembly No. X144 (F9C-2)

Type Hardware: MK-E-19D

Orifice: No. of Holes 7; Dia. of Holes 0.187

Lower Adapter Modifications: None

Flow Test Data: ~ 32 gpm in row 6

Date Assembled: 1/13/72; Location HFEP

Date Loaded in Reactor: 2/2/72; for Run 54

Initial Grid Position: 6B4

Notes:

1. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.
2. Irradiated elements are from X056.

Position	Sponsor	Ident. No.	Comments
1	GE	F9E-03	
2		-02	
3		-01	
4		-39	Removable
5		-06	
6		-05	
7		-04	
8		-40	Removable
9		-43	Removable
10		-10	
11		-09	
12		-08	
13		-41	Removable
14		-44	Removable
15		-07	
16		-46	Removable
17		-14	
18		-13	
19		-42	Removable
20		-12	
21		-11	
22		-45	Removable
23		-20	
24		-19	
25		-18	
26		-17	
27		-16	
28		-15	
29		-25	
30		-24	
31		-23	
32		-22	
33		-21	
34		-29	
35		-28	
36		-27	
37		-26	

Subassembly No. X145

Type Hardware: GE F9E Grid Type

Orifice: No. of Holes 1; Dia. of Holes 1.025

Lower Adapter Modifications: None

Flow Test Data: 56.5 gpm in row 6 @ 45 psi

Date Assembled: 6/2/72; Location FASB

Date Loaded in Reactor: 6/25/72; for Run 56

Initial Grid Position: 6C4

Note:

All elements contain UO_2 -25 wt % PuO_2 fuel;
uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	ANC	I-7-10	BeO
2	ANC	I-7-9	BeO
3	ANC	I-7-6	BeO
4	ANC	I-7-11	BeO
5	ANC	I-7-18	BeO
6	ANC	I-7-17	BeO
7	ANC	I-7-7	BeO
8	ANC	I-7-12	BeO
9	ANC	I-7-19	BeO
10	ANC	I-7-1	Fission Yield
11	ANC	I-7-16	BeO
12	ANC	I-7-8	BeO
13	ANC	I-7-13	BeO
14	ANC	I-7-14	BeO
15	ANC	I-7-15	BeO
16	ANC	I-7-5	BeO
17	ANC	I-7-2	BeO
18	ANC	I-7-3	BeO
19	ANC	I-7-4	BeO

Subassembly No. X146

Type Hardware: Standard Outer Blanket

NOT ORIFICED

Lower Adapter Modifications: None

FLOW TEST WAIVED

Date Assembled: 9/16/71; Location IT

Date Loaded in Reactor: 9/19/71; for Run 51C

Initial Grid Position: 10D5

Position	Sponsor	Ident. No.	Comments
1	ANL	EA-111	Structural
2	ANL	EA-92	Structural
3	ANL	EA-227	Structural
4	ANL	EA-117	Structural
5	ANL	EA-226	Structural
6	ANL	EA-84	Structural
7	ANL	EA-118	Structural
8	ANL	EA-63	Structural
9	ANL	EA-68	Structural
10	ANL	EA-228	Structural
11	ANL	EA-110	Structural
12	ANL	EA-95	Structural
13	ANL	EA-70	Structural
14	ANL	EA-116	Structural
15	ANL	EA-64	Structural
16	ANL	EA-141	Structural
17	ANL	EA-223	Structural
18	ANL	EA-38	Structural
19	ANL	EA-121	Structural
20	ANL	EA-96	Structural
21	ANL	EA-225	Structural
22	ANL	EA-119	Structural
23	ANL	EA-97	Structural
24	ANL	EA-131	Structural
25	ANL	EA-220	Structural
26	ANL	EA-147	Structural
27	ANL	EA-115	Structural
28	ANL	EA-229	Structural
29	ANL	EA-222	Structural
30	ANL	EA-56	Structural
31	ANL	EA-113	Structural
32	ANL	EA-120	Structural
33	ANL	EA-148	Structural
34	ANL	EA-112	Structural
35	ANL	EA-224	Structural
36	ANL	EA-73	Structural
37	ANL	EA-114	Structural

Subassembly No. X147

Type Hardware: MK-L-37

Orifice: No. of Holes 2; Dia. of Holes 0.063
(In each of three plates in series)

Lower Adapter Modifications: None

Flow Test Data: 0.72 gpm in row 7

Date Assembled: 2/29/72; Location ITF

Date Loaded in Reactor: 3/5/72; for Run 55

Initial Grid Position: 7D5

Position	Sponsor	Ident. No.	Comments
1	NUMEC/ANL	C-3	Oxide Fuel
2	GE	(OB) L15B	Structural
3	NUMEC/ANL	C-12	Oxide Fuel
4	GE	(OC) L15C	Structural
5	NUMEC/ANL	C-9	Oxide Fuel
6	NUMEC/ANL	C-16	Oxide Fuel
7	GE	(OA) L15A	Structural
8	NUMEC/ANL	C-17	Oxide Fuel
9	NUMEC/ANL	C-14	Oxide Fuel
10	GE	(OD) L15D	Structural
11	NUMEC/ANL	B-7	Oxide Fuel
12	NUMEC/ANL	C-4	Oxide Fuel
13	GE	MT-4	Structural
14	NUMEC/ANL	C-18	Oxide Fuel
15	NUMEC/ANL	C-7	Oxide Fuel
16	NUMEC/ANL	C-8	Oxide Fuel
17	NUMEC/ANL	C-13	Oxide Fuel
18	NUMEC/ANL	B-6	Oxide Fuel
19	NUMEC/ANL	C-2	Oxide Fuel

Subassembly No. X148

Type Hardware: MK-A-19

Orifice: No. of Holes 1; Dia. of Holes 0.407

Lower Adapter Modifications: None

Flow Test Data: ~ 25 gpm in row 6

Date Assembled: 8/31/71; Location HFEF

Date Loaded in Reactor: 10/10/71; for Run 52

Initial Grid Position: 6B3

Note:

UO_2 -20 wt % PuO_2 fuel; uranium 93% enriched.

Pos.	Sponsor	Ident. No.	Pos.	Sponsor	Ident. No.
1	ANT.	EV-1	32	ANL	EV-25
2		EV-2	33		EV-26
3		EV-3	34		EV-27
4		EV-4	35		EV-28
5		EV-5	36		EV-29
6		EV-6	37		EV-30
7		EV-7	38		EV-31
8		EW-55	39		EV-32
9		EW-8	40		EW-66
10		EW-57	41		EV-33
11		EV-9	42		EW-64
12		EV-10	43		EV-34
13		EW-53	44		EV-35
14		EV-11	45		EW-60
15		EV-12	46		EV-36
16		EV-13	47		EV-37
17		EV-14	48		EV-38
18		EV-15	49		EV-39
19		EV-16	50		EV-40
20		EV-17	51		EV-41
21		EV-18	52		EV-42
22		EV-19	53		EW-61
23		EW-67	54		EV-43
24		EV-20	55		EW-63
25		EW-58	56		EV-44
26		EV-21	57		EV-45
27		EV-22	58		EV-46
28		EW-39	59		EV-47
29		EV-23	60		EV-48
30		EW-65	61		EV-49
31		EV-24			

Note: All elements contain Mark-1A driver fuel;
EW series incorporate partial bonds.

Subassembly No. X149

Type Hardware: MK-E-61A

Orifice: No. of Holes 2; Dia. of Holes 0.500
(In series) 1

Lower Adapter Modifications: None

Flow Test Data: 37.5 gpm in row 7 @ 41 psi

Date Assembled: 2/14/72; Location FASB

Date Loaded in Reactor: 10/15/72; for Run 59A

Initial Grid Position: 7A6

Position	Sponsor	Ident. No.	Comments
1	HEDL	P12A-1A	
2		2A	
3		11B	
4		19C	
5		34E	
6		35E	
7		29D	
8		30D	
9		20C	
10		39F	
11		40F	
12		45G	
13		46G	
14		53H	
15		54H	
16		21C	
17		22C	
18		12B	
19		3A	
20		4A	
21		62K	
22		63K	
23		31D	
24		32D	
25		36E	
26		37E	
27		41F	
28		42F	
29		64K	
30		55H	
31		56H	
32		47G	
33		52GR	
34		65K	
35		5A	
36		13B	
37		23C	

Subassembly No. X150 (P12A)

Type Hardware: MK-J-37A

Orifice: No. of Holes See Note 1 ; Dia. of Holes _____

Lower Adapter Modifications: None

Flow Test Data: 62 gpm in row 6 @ 45 psi

Date Assembled: 6/6/72 ; Location FASB

Date Loaded in Reactor: 6/26/72 ; for Run 56

Initial Grid Position: 6E4

Notes:

1. Upper orifice plate per EB-1-50778, with 7 holes of 7/32 in. dia. Lower orifice plate per EB-1-51168 was omitted. Shield per EB-1-50779, with 6 holes of 9/32 in. dia.

2. All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	GE	F5E	Oxide Fuel
2		E1H-24	
3		E1H-32	
4		F5S	
5		F5D	
6		E1H-28	
7		E1H-20	
8		F5J	
9		F5H	
10		F5R	
11		F5P	
12		F5N	
13		E1H-22	
14		F5O	
15		E1H-27	
16		F5K	
17		F5I	
18		E1H-25	
19		E1H-34	

Subassembly No. X151

Type Hardware: MK-A-19A

Orifice: No. of Holes 7; Dia. of Holes 0.157

Lower Adapter Modifications: None

Flow Test Data: 27 gpm in row 6

Date Assembled: 3/2/72; Location HFEF

Date Loaded in Reactor: 3/10/72; for Run 55

Initial Grid Position: 6A4

Note:

UO₂-25 wt % PuO₂ fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	LASL	K-43	Carbide Fuel
2	LASL	K-39	Carbide Fuel
3	BMT	2-2	Nitride Fuel
4	UNC	196	Carbide Fuel
5	LASL	K-38	Carbide Fuel
6	BMT	2-1	Nitride Fuel
7	WARD	W3F	Carbide Fuel
8	UNC	188	Carbide Fuel
9	UNC	190	Carbide Fuel
10	BMT	1-2	Nitride Fuel
11	BMT	2-7	Nitride Fuel
12	WARD	W10F	Carbide Fuel
13	UNC	193	Carbide Fuel
14	BMT	1-1	Nitride Fuel
15	BMT	2-6	Nitride Fuel
16	WARD	W7F	Carbide Fuel
17	LASL	K-44	Carbide Fuel
18	BMT	2-3	Nitride Fuel
19	WARD	W4F	Carbide Fuel

Subassembly No. X152

Type Hardware: HK-A-19A

Orifice: No. of Holes 7; Dia. of Holes 0.250

Lower Adapter Modifications: None

Flow Test Data: ~48 gpm in row 5

Date Assembled: 1/28/72; Location HFEE

Date Loaded in Reactor: 2/3/72; for Run 54

Initial Grid Position: 5D2

Note 1: LASL and WARD fuel is ($U_{0.80} - Pu_{0.20}$)C, BMT fuel ($U_{0.80} - Pu_{0.20}$)N, and UNC fuel ($U_{0.85} - Pu_{0.15}$)C. Uranium is 93% enriched in all.

Note 2:

Utilizes alternate elevation for shroud tube bundle.

Position	Sponsor	Ident. No.	Comments
2		Dummy	
3		Dummy	
4		Dummy	
5		Dummy	
6		Dummy	
7		Dummy	
8		Dummy	
9		Dummy	
10	ANC	I-11-0	Fission-product Cross Section
11		Dummy	
12		Dummy	
13		Dummy	
14		Dummy	
15		Dummy	
16		Dummy	
17		Dummy	
18		Dummy	
19		Dummy	

Subassembly No. X153

Type Hardware: MK-B-19

Orifice: No. of Holes 1 3; Dia. of Holes 0.375
(In series) 0.216

Lower Adapter Modifications: None

Flow Test Data: ~17 gpm in row 7

Date Assembled: 1/6/73; Location HFEF

Date Loaded in Reactor: 1/13/73; for Run 61A

Initial Grid Position: 7E5

Position	Sponsor	Ident. No.	Comments
1	WARD	W4-1	Oxide Fuel
2		W4-2	
3		W4-3	
4		W4-4	
5		W4-5	
6		W4-6	
7		W4-7	
8		W4-8	
9		W4-9	
10		W4-10	
11		W4-11	
12		W4-12	
13		W4-13	
14		W4-14	
15		W4-15	
16		W4-16	
17		W4-38	
18		W4-18	
19		W4-19	
20		W4-20	
21		W4-21	
22		W4-22	
23		W4-23	
24		W4-24	
25		W4-25	
26		W4-26	
27		W4-27	
28		W4-28	
29		W4-29	
30		W4-30	
31		W4-31	
32		W4-32	
33		W4-33	
34		W4-34	
35		W4-35	
36		W4-36	
37		W4-37	

Subassembly No. X154

Type Hardware: WSA-4 Grid Type

Orifice: No. of Holes 6; Dia. of Holes 0.173

Lower Adapter Modifications: None

Flow Test Data: 21.3 gpm in row 4

Date Assembled: 6/9/72; Location FASB

Date Loaded in Reactor: 6/27/72; for Run 56

Initial Grid Position: 4B2

Note: All elements contain UO_2 -25 wt % PuO_2 fuel; uranium 20% enriched.

Position	Sponsor	Ident. No.	Comments
1	GE	F9F-04	Oxide Fuel
2		-10	
3		-18	
4		-25	
5		-03	
6		-09	
7		-17	
8		-24	
9		-31	
10		-02	
11		-08	
12		-16	
13		-23	
14		-30	
15		-36	
16		-01	
17		-07	
18		-15	
19		-22	
20		-29	
21		-35	
22		-40	
23		-06	
24		-13	
25		-21	
26		-28	
27		-34	
28		-39	
29		-11	
30		-20	
31		-27	
32		-33	
33		-38	
34		-19	
35		-26	
36		-32	
37		-37	

Subassembly No. X155

Type Hardware: GE F9F Grid Type

Orifice: No. of Holes 7 ; Dia. of Holes 0.262

Lower Adapter Modifications: None

Flow Test Data: 48 gpm in row 5 @ 37.5 psi

Date Assembled: 10/11/72 ; Location FASB

Date Loaded in Reactor: 10/16/72 ; for Run 59

Initial Grid Position: 5D2

Note:

All elements contain UO_2 -25 wt % PuO_2 ;
uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	HEDL	B-73	Structural
2	HEDL	B-70	Structural
3	HEDL	B-68	Structural
4	HEDL	B-92	Structural
5	HEDL	B-71	Structural
6	HEDL	B-72	Structural
7	HEDL	B-69	Structural

Subassembly No. X157

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~13 gpm in row 4

Date Assembled: 5/27/72; Location HFEF

Date Loaded in Reactor: 6/26/72; for Run 56A

Initial Grid Position: 4D2

Position	Sponsor	Ident. No.	Comments
1	HEDL	B-76	Structural
2	HEDL	B-70	Structural
3	HEDL	B-68	Structural
4	HEDL	B-92	Structural
5	HEDL	B-74	Structural
6	HEDL	B-75	Structural
7	HEDL	B-76	Structural

Subassembly No. X157A

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: ~ 13 gpm in row 4

Date Assembled: 10/11/72; Location HFEF

Date Loaded in Reactor: 10/16/72; for Run 59A

Initial Grid Position: 4D2

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	HEDL	B67	Structural

Subassembly No. X158

Type Hardware: MK-M-1A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 14.3 gpm in row 2

Date Assembled: 6/9/72; Location ITF

Date Loaded in Reactor: 6/25/72; for Run 56A

Initial Grid Position: 2F1

Position	Sponsor	Ident. No.	Comments
1	ANL	A404AA3	
2		A416BV5	
3		AM4119A	Flux Monitor
4		A405AP5	
5		A402AA1	
6		A412B05	
7		A411BP5	
8		A403AP3	
9		A401AP1	
10		A430CV5	
11		A409B03	
12		A406BP1	
13		A415BV5	
14		A410BM5	
15		A407BM3	
16		A413BP5	
17		AM4101C	Flux Monitor
18		A408BP3	
19		A417DP1	

Subassembly No. X159

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 0.422
(In series) 2 ; Dia. of Holes 0.297

Lower Adapter Modifications: None

Flow Test Data: 19 gpm in row 7 @ 45.3 psi

Date Assembled: 8/7/72 ; Location FASR

Date Loaded in Reactor: 8/9/72 ; for Run 57A

Initial Grid Position: 7B1

Note:

UO₂-25 wt % PuO₂ fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	ANL	A502AA1	
2		A514BV5	
3		A516BV5	
4		A501AP1	
5		A505AP5	
6		A515BV5	
7		A512B05	
8		AM5101C	Flux Monitor
9		A504AA5	
10		A513BP5	
11		A511BP5	
12		AM5119A	Flux Monitor
13		A503AP5	
14		A507BM5	
15		A510BM5	
16		A506BP1	
17		A508BP5	
18		A509B05	
19	Y	A517DP1	

Subassembly No. X160

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 0.641
(In series) 2 ; Dia. of Holes 0.453

Lower Adapter Modifications: None

Flow Test Data: 34 gpm in row 5 @ 37.6

Date Assembled: 9/8/72 ; Location FASB

Date Loaded in Reactor: 9/10/72 ; for Run 58A

Initial Grid Position: 5B4

Note:

UO_2 -25 wt % PuO_2 fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	HEDL	P19-12R	
2	ANL	A414CV5	
3	ANL	AM4A19D	Flux Monitor
4	ANL	A426AP1	
5	ANL	A419BA3	
6	ANL	A429B01	
7	ANL	A431DP1	
8	HEDL	P19-11R	
9	ANL	A418AP3	
10		A428BP1	
11		A425CA3	
12		A421DA5	
13		A422AP3	
14		A427BM1	
15		A424CP3	
16		A432BP1	
17		AM4A01D	Flux Monitor
18		A423AA3	
19		A420DP5	

Subassembly No. X161

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 ; Dia. of Holes 0.422
(In series) 2 ; Dia. of Holes 0.297

Lower Adapter Modifications: None

Flow Test Data: 19 gpm in row 7 @ 45.3 psi

Date Assembled: 10/6/72 ; Location FASB

Date Loaded in Reactor: 10/15/72 ; for Run 59A

Initial Grid Position: 7B1

Note:

UO₂-25 wt % PuO₂ fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	ANL	A519BA5	
2		A530CV1	
3		A526AP1	
4		A518AP3	
5		A529B01	
6		A524BP3	
7	HEDL	P19-19R	
8	ANL	AM5A01D	Flux Monitor
9		A527BM1	
10		A528BP1	
11		A-15R	
12		AM5A19D	Flux Monitor
13			Dummy
14			Dummy
15	ANL	A531DP1	
16		A521DA5	
17		A522AP5	
18		A523BP1	
19		520DP5	

Subassembly No. X162

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 2; Dia. of Holes 0.641
(In series) 0.453

Lower Adapter Modifications: None

Flow Test Data: 34 gpm in row 5 @ 37.6 psi

Date Assembled: 10/6/72; Location FASB

Date Loaded in Reactor: 10/15/72; for Run 59A

Initial Grid Position: 5B4

Note:

UO₂-25 wt % PuO₂ fuel; uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	ANC	I-16-1	Structural
2	ANC	I-16-2	Structural
3	ANC	I-16-3	Structural
4	ANC	I-16-4	Structural
5	ANC	I-16-5	Structural
6	ANC	I-16-6	Structural
7	ANC	I-16-7	Structural

Subassembly No. X165

Type Hardware: MK-B-7A

Orifice: No. of Holes 3 ; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 14.7 gpm in row 7

Date Assembled: 8/4/72 ; Location FASB

Date Loaded in Reactor: 8/9/72 ; for Run 57A

Initial Grid Position: 7C3

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	NRL	H-3	Structural

Subassembly No. X166

Type Hardware: MK-M-1

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 14 gpm in row 4

Date Assembled: 10/10/72; Location FASB

Date Loaded in Reactor: 10/14/72; for Run 59A

Initial Grid Position: 4B3

Position	Sponsor	Ident. No.	Comments
1	GE	MT-4	Structural
2	ANL	C-12	Oxide Fuel
3	ANL	B-7	Oxide Fuel
4			Dummy
5	ANL	C-14	Oxide Fuel
6	ANL	B-6	Oxide Fuel
7	GE	E1H-37	Oxide Fuel
8			Dummy
9	ANL	C-9	Oxide Fuel
10	ANL	C-7	Oxide Fuel
11	GE	F5C	Oxide Fuel
12			Dummy
13	ANL	C-3	Oxide Fuel
14	ANL	C-18	Oxide Fuel
15	GE	F5B	Oxide Fuel
16			Dummy
17	ANL	C-13	Oxide Fuel
18	ANL	C-4	Oxide Fuel
19			Dummy

Subassembly No. X167

Type Hardware: MK-A-19A

Orifice: No. of Holes 7; Dia. of Holes 0.156

Lower Adapter Modifications: None

Flow Test Data: ~ 29 gpm in row 6 @ 45 psi

Date Assembled: 10/14/72; Location HFEF

Date Loaded in Reactor: 10/16/72; for Run 59A

Initial Grid Position: 6A3

Note:

ANL fuel UO_2 -20 wt % PuO_2 ; uranium 93% enriched.
 GE fuel UO_2 -25 wt % PuO_2 ; uranium 93% enriched.

AS-BUILT LOADING SPECIFICATIONS

Subassembly No. XI68

Type Hardware: MK-7-61A
2 0.500

Orifice: No. of Holes 1; Dia. of Holes 0.703
(In series)

Lower Adapter Modifications: None

Flow Test Data: ~ 40 gpm in row 6 @ 45.3 psi

Date Assembled: 11/22/72; Location HFEF

Date Loaded in Reactor: 12/10/72; for Run 60

Initial Grid Position: 6E3

Pos.	Sponsor	Ident. No.	Pos.	Sponsor	Ident. No.
1	ANL	30327	32	ANL	08236
2		28054	33		08008
3		08228	34		23763
4		22856	35		23868
5		24203	36		27638
6		24915	37		30569
7		26102	38		07814
8		28159	39		07449
9		30484	40		06431
10		30554	41		06206
11		29204	42		30833
12		08215	43		26048
13		26765	44		06379
14		08213	45		29218
15		06398	46		08651
16		06249	47		09676
17		31464	48		09967
18		06323	49		26853
19		27553	50		09116
20		30637	51		29825
21		06453	52		31992
22		10445	53		30489
23		10329	54		32561
24		09992	55		30977
25		30494	56		23178
26		26502	57		30788
27		29329	58		27721
28		31373	59		10237
29		08973	60		25865
30		12255	61		26321
31		32007			

Note: All elements contain Mark-IA driver fuel.

Position	Sponsor	Ident. No.	Comments
1	HEDL	P20-15	Oxide Fuel
2		P20-5	
3		P20-3	
4		P19-1R	
5		P20-11	
6		P20-4	
7		P20-12	
8		P20-34R	
9		P20-26	
10		P20-21	
11		P20-20	
12		P20-8	
13		P20-36	
14		P20-27	
15		P20-28	
16		P20-29	
17		P20-35	
18		P20-37	
19		P19-14	

Subassembly No. X169 (HEDL P-20 Phase II)

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 0.641
 (In series) 2 ; Dia. of Holes 0.453

Lower Adapter Modifications: None

Flow Test Data: 38 gpm in row 3 @ 43 psi

Date Assembled: 10/20/72 ; Location FASB

Date Loaded in Reactor: 10/23/72 ; for Run 59B

Initial Grid Position: 3F2

Note :

All capsules contain UO_2 -25 wt % PuO_2 fuel;
 uranium 93% enriched.

Position	Sponsor	Ident. No.	Comments
1	HEDL	P20-10	Oxide Fuel
2		P20-1	
3		P20-3	
4		P20-24	
5		P20-11	
6		P20-4	
7		P20-9	
8		P20-34R	
9		P20-26	
10		P20-18	
11		P20-20	
12		P20-2R	
13		P20-32	
14		P20-27	
15		P20-25R	
16		P20-19	
17		P20-35	
18		P20-33	
19		P19-23	

Subassembly No. X169A (HEDL P-20 Phase I)

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 0.641
(In series) 2 0.453

Lower Adapter Modifications: None

Flow Test Data: ~38 gpm in row 3 @ 43 psi

Date Assembled: 1/8/73; Location HFEF

Date Loaded in Reactor: 1/13/73; for Run 61A

Initial Grid Position: 3F2

Note:

All capsules contain UO_2 -25 wt % PuO_2 fuel;
uranium 93% enriched.

Note:

Dosimetry capsule EX170DOS was located
in lower triffute reflector of subassembly.

Subassembly No. X170

Type Hardware: Standard Core Driver

NO ORIFICING IN STANDARD CORE DRIVER

Lower Adapter Modifications: None

Flow Test Data: ~85 gpm in row 4

Date Assembled: 10/20/72; Location FASB

Date Loaded in Reactor: 10/23/72; for Run 59B

Initial Grid Position: 4E1

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	LASL	K-5	Thermionic Insulator

Subassembly No. XL71

Type Hardware: MK-M-1A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 6.7 gpm in row 8

Date Assembled: 12/8/72; Location FASB

Date Loaded in Reactor: 12/10/72; for Run 60A

Initial Grid Position: 8A1

Position	Sponsor	Ident. No.	Comments
1		Dummy	
2	HEDL	B93	Structural
3		Dummy	
4		Dummy	
5	HEDL	B94	Structural
6		Dummy	
7		Dummy	

Subassembly No. X175

Type Hardware: MK-B-7A

Orifice: No. of Holes 3 ; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 14.3 gpm in row 4

Date Assembled: 12/7/72 ; Location FASB

Date Loaded in Reactor: 12/10/72 ; for Run 60A

Initial Grid Position: 4A1

Position	Sponsor	Ident. No.	Comments
1	ANL	ASOVG-19	Oxide Fuel
2		ASOPC-2	Oxide Fuel
3		AO3-D1	Structural
4		ASOVG-21	Oxide Fuel
5		ASOPC-8	Oxide Fuel
6		ASOPC-6	Oxide Fuel
7	↓	B4	Oxide Fuel
8			Dummy
9	ANL	ASOPC-10	Oxide Fuel
10			Dummy
11	ANL	ASOV-14	Oxide Fuel
12	↓	B8	Oxide Fuel
13			Dummy
14	ANL	ASOVG-18	Oxide Fuel
15	↓	ASOVG-20	Oxide Fuel
16	↓	ASOV-16	Oxide Fuel
17			Dummy
18			Dummy
19	ANL	ASOPC-7	Oxide Fuel

Subassembly No. X176

Type Hardware: MK-A-19A

Orifice: No. of Holes 1 0.548
(In series) 2 ; Dia. of Holes 0.387

Lower Adapter Modifications: None

Flow Test Data: ~ 27.5 gpm in row 7 @ 45.3 psi

Date Assembled: 12/4/72 ; Location HFEF

Date Loaded in Reactor: 12/12/72 ; for Run 60

Initial Grid Position: 7D1

Note:

UO₂-20 wt % PuO₂ fuel; uranium 93% enriched.

Subassembly No. X178

Type Hardware: MK-D-1

Orifice: Open Orifice

Lower Adapter Modifications: None

Flow Test Data: 68 gpm in row 6

Date Assembled: 2/22/73; Location FASB

Date Loaded in Reactor: 2/23/73; for Run 62

Initial Grid Position: 6A4

Subassembly contains 91 standard Mark-IA
driver fuel elements plus 3 flowmeter
components located at each end.

Subassembly No. X179

Type Hardware: MK-B-7A

Orifice: No. of Holes 3; Dia. of Holes 0.162

Lower Adapter Modifications: None

Flow Test Data: 14 gpm in row 7

Date Assembled: 1/9/73; Location FASB

Date Loaded in Reactor: 1/13/73; for Run 61A

Initial Grid Position: 7E3

Position	Sponsor	Ident. No.	Comments
1	HEDL	BCM 2-1	Boron Carbide
2	HEDL	BCM 2-2	Boron Carbide
3	HEDL	BCM 2-3	Boron Carbide
4	HEDL	BCM 2-4	Boron Carbide
5	HEDL	BCM 2-5	Boron Carbide
6	HEDL	BCM 2-6	Boron Carbide
7	HEDL	BCM 2-7	Boron Carbide

Note:

Orientation of index hole on capsules indicated by "X".

Position	Sponsor	Ident. No.	Comments
1	HEDL	4	Oxide Fuel
2	HEDL	5	Oxide Fuel
3	HEDL	10-5	Oxide Fuel
4	HEDL	16-6A-4R	Oxide Fuel
5	HEDL	3R	Oxide Fuel
6	HEDL	28-2A	Oxide Fuel
7	HEDL	29-2A	Oxide Fuel
8	HEDL	17-6B-4	Oxide Fuel
9	HEDL	11-5R	Oxide Fuel
10	HEDL	2	Oxide Fuel
11	HEDL	30-2B-5	Oxide Fuel
12	HEDL	31-2B	Oxide Fuel
13	HEDL	18-6C-4	Oxide Fuel
14	HEDL	20-1A	Oxide Fuel
15	ANL	----	Conduit Tube
16	HEDL	1	Oxide Fuel
17	HEDL	32-2C	Oxide Fuel
18	HEDL	33-2C	Oxide Fuel
19	HEDL	19-6D-4	Oxide Fuel
20	HEDL	22-1B	Oxide Fuel
21	HEDL	21-1A	Oxide Fuel
22	HEDL	6	Oxide Fuel
23	ANL	----	Neutron Detector
24	HEDL	34-2D	Oxide Fuel
25	HEDL	26-1D	Oxide Fuel
26	HEDL	24-1C	Oxide Fuel
27	HEDL	23-1B	Oxide Fuel
28	HEDL	12-5	Oxide Fuel
29	HEDL	14-5	Oxide Fuel
30	HEDL	35-2D	Oxide Fuel
31	HEDL	27-1D	Oxide Fuel
32	HEDL	25-1C	Oxide Fuel
33	HEDL	7	Oxide Fuel
34	HEDL	15-4	Oxide Fuel
35	HEDL	9	Oxide Fuel
36	HEDL	13-5	Oxide Fuel
37	HEDL	8	Oxide Fuel

Subassembly No. XX04

Type Hardware: INSAT

Orifice: No. of Holes Not Applicable; Dia. of Holes Not Applicable

Lower Adapter Modifications: None

Flow Test Data: ~50 gpm in row 5

Date Assembled: 7/71; Location ANL-East

Date Loaded in Reactor: 9/16/71; for Run 51C

Initial Grid Position: 5F3

Note:

UO₂-25 wt % PuO₂ fuel; uranium enriched 80% and 93%.

<u>Position</u>	<u>Sponsor</u>	<u>Ident. No.</u>	<u>Comments</u>
1	HEDL	B52	Instrumented Creep

Subassembly No. XX05

Type Hardware: INSAT

Orifice: No. of Holes 2/plate ; Dia. of Holes 0.205
(3 plates in series)

Lower Adapter Modifications: None

Flow Test Data: ~ 7 gpm in row 5

Date Assembled: 9/72 ; Location HEDL

Date Loaded in Reactor: 12/1/72 ; for Run 60

Initial Grid Position: 5F3

Note:

Sponsor: HEDL. Experiment consisted of two flowmeters fabricated by Kaman Sciences Corporation.

Subassembly No. YY01

Type Hardware: INCOT

Orifice: No. of Holes ^{Not ap-}
plicable; Dia. of Holes ^{Not ap-}
plicable

Lower Adapter Modifications: None

Flow Test Data: ~1 gpm in row 5

Date Assembled: 2/72; Location ANL-East

Date Loaded in Reactor: 5/5/72; for Run 56A

Initial Grid Position: 5A3

Subassembly No. YY02

Type Hardware: INCOT

Orifice: No. of Holes Not applicable ; Dia. of Holes Not applicable

Lower Adapter Modifications: None

Flow Test Data: ~ 4.5 gpm in row 5

Date Assembled: 9/72 ; Location HEDL

Date Loaded in Reactor: 12/1/72 ; for Run 60A

Initial Grid Position: 5A3

Note:

Sponsor: HEDL. Experiment consisted of 20 specimens of B_4C , each instrumented for measurement of pressure and temperature.