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November 14, 2018
FS-18-00289

ATTN: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, DC 20555-0001

SUBJECT: BRR Package Amendment Request, Docket No. 71-9341 and EPID No. L-2018-LLA-0028

Dear Mr. Devaser:

Orano Federal Services LLC (Orano FS) hereby submits Revision 14 of the Safety Analysis Report (SAR) for the BRR Package, which consists entirely of a correction to Note 13 on Sheet 1 of drawing 1910-01-01-SAR.

The note has been changed FROM:

Forged material shall be ultrasonically and liquid penetrant inspected in accordance with ASME Code, Section III, Division 1, Subsection NB, Article NB-2540, and Section V, Articles 4 and 6.

TO:

Forged material shall be ultrasonically and liquid penetrant inspected in accordance with ASME Code, Section III, Division 1, Subsection NB, Article NB-2540, and Section V, Articles **5** and 6.

The only change is that Article 4 has been changed to Article 5. This corrects a minor error in the inspection techniques. Article 4 of Section V refers to ultrasonic inspection of welds, whereas the correct Article for the inspection of forgings is Article 5. This error was identified during a NRC inspection of the facility currently fabricating BRR packagings during the week of 11/5/18.

In order that this correction can be supplied to the fabricator at the earliest possible date, it would be greatly appreciated if this change could be incorporated into the licensing action currently underway for the BRR package. In addition, our DOE client has scheduled isotope shipments to occur shortly after the beginning of the new year. For these reasons, a Certificate of Compliance issue date as early as the end of November, or by mid-December at the latest, would be appreciated.

This change affects only Note 13 on sheet 1 of drawing 1910-01-01-SAR, which has been advanced to Revision 7. For completeness and to comply with Orano's

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procedures, all five sheets of drawing 1910-01-01-SAR, the SAR cover sheet and binder spine, and the Table of Contents (six pages) are supplied as part of this amendment request. Note, there are no changes to any other drawings or to any SAR text.

Included with this letter is one paper copy of the stated drawing and SAR update pages and one CD containing the PDF file "BRR SAR Complete Rev. 14.pdf" (35,910 kb, 777 pages). The CD is labeled, "BRR Package SAR Revision 14, Docket 71-9341 EPID No. L-2018-LLA-0028".

To update a paper copy of the SAR, replace the cover sheet, Table of Contents, and drawing 1910-01-01-SAR (five sheets). An extra cover sheet and spine sheet are provided to update the binder.

Should you have any questions regarding this submittal, please contact me at (233) 552-1321 or via email (phil.noss@orano.group).

Yours Truly,

Philip Noss
Licensing Manager
Orano Federal Services LLC

Copies:

Attention: Nishka Devaser, Project Manager (incl. changed pages and CD)
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Rockville, MD 20852

Donald Darrington, Idaho National Laboratory (incl. changed pages and CD)

Carla Dwight, Idaho National Laboratory (incl. changed pages and CD)

Dr. Ethan Balkin, DOE-SC Isotope Programs (incl. changed pages and CD)

Richard J. Smith, Project Manager, Orano Federal Services LLC

Tess Klatt, Contracts, Orano Federal Services LLC

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BEA Research Reactor Package

Safety Analysis Report
Docket 71–9341

Revision 14
November 2018

DOCKET 71–9341

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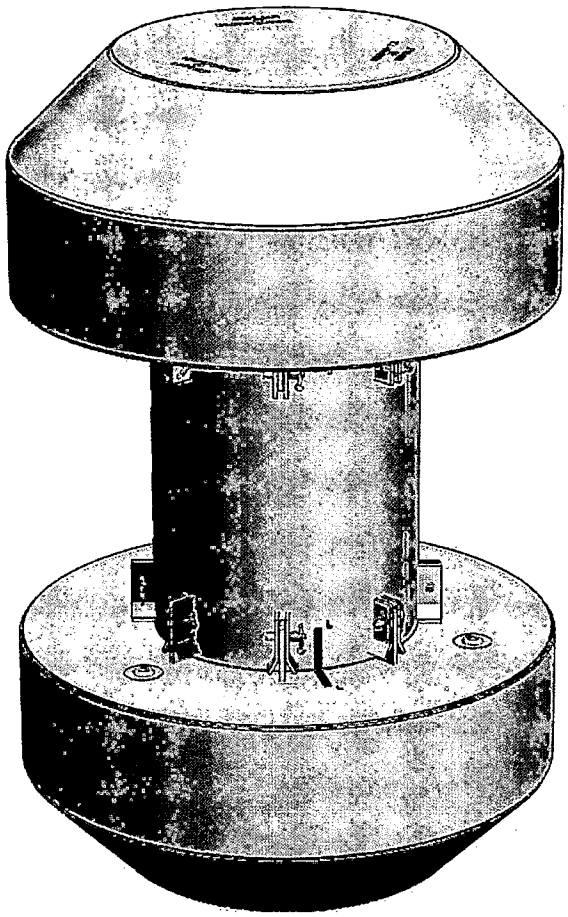
BEA Research Reactor Package



Safety Analysis Report

Revision 14

Orano Federal Services LLC

November 2018

DOCKET 71–9341

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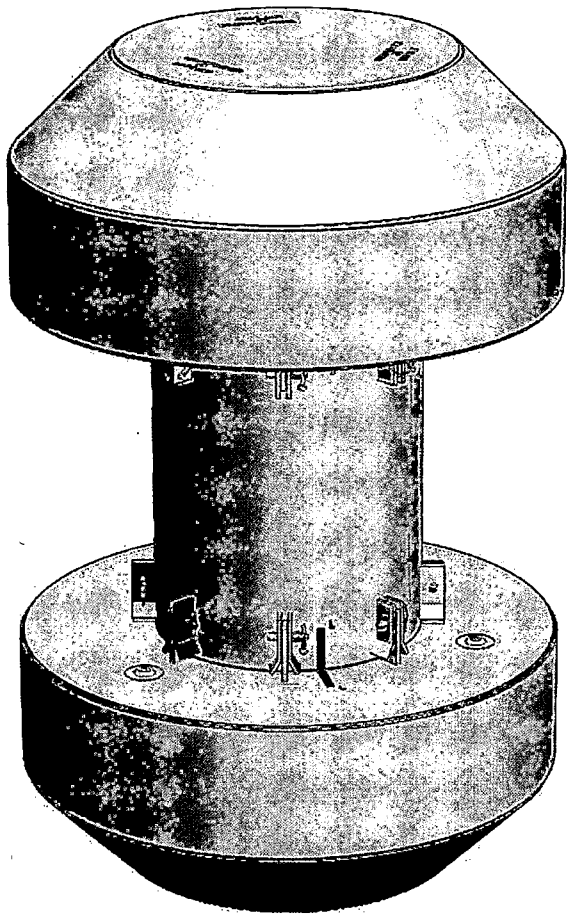
BEA Research Reactor Package



Safety Analysis Report

Revision 14

Orano Federal Services LLC

November 2018

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NOTES, UNLESS OTHERWISE SPECIFIED:

1. INTERPRET DRAWING PER ASME Y14.5M. INTERPRET WELDS PER ANSI/AWS A2.4.
2. THREADS PER ANSI B1.1.
3. THE PACKAGE SHALL BE IDENTIFIED IN ACCORDANCE WITH THE REQUIREMENTS OF 10 CFR 71.85(c) USING A STAINLESS STEEL NAMEPLATE.
4. ALL WELDING PROCEDURES AND PERSONNEL SHALL BE QUALIFIED IN ACCORDANCE WITH ASME SECTION IX.
5. ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH AWS D1.6.
6. INDICATED WELDS SHALL BE LIQUID PENETRANT INSPECTED ON THE FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000, AND SECTION V, ARTICLE 6.
7. INDICATED WELDS SHALL BE RADIOGRAPH INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000, AND SECTION V, ARTICLE 2.
8. INDICATED WELDS SHALL BE ULTRASONICALLY INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000, AND SECTION V, ARTICLE 4.
9. ALL ITEMS MADE FROM SHEET MATERIAL MAY BE MADE FROM TWO OR MORE PIECES, AND JOINED WITH COMPLETE PENETRATION WELDS, INSPECTED IN ACCORDANCE WITH G/N 28.
10. ASTM A240, A276 OR A479 ARE OPTIONAL MATERIAL FORMS THAT MAY BE SUBSTITUTED FOR ANY ASTM A240, A276 OR A479, TYPE 304 STAINLESS STEEL.
11. OPTION: LEAD MAY BE PER FEDERAL SPECIFICATION QQ-L-171E, GRADE A OR C.
12. CAST MATERIAL SHALL BE RADIOGRAPH AND LIQUID PENETRANT INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLES NB-2570, AND SECTION V, ARTICLES 2 AND 6.
13. FORGED MATERIAL SHALL BE ULTRASONICALLY AND LIQUID PENETRANT INSPECTED IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-2540, AND SECTION V, ARTICLES 5 AND 6.
14. WHEN MATERIAL OPTION ASTM A182, GRADE F304 IS USED, INSPECT PER G/N 13.
15. WHEN MATERIAL OPTION ASTM A182, GRADE F304 IS USED, INSPECT PER G/N 13. WHEN MATERIAL OPTION ASTM A451, GRADE CPF8A IS USED, INSPECT PER F/N 12.
16. WELDMENT OF END CASTINGS (I/N 15 AND I/N 16) TO INNER AND OUTER SHELLS (I/N 17 AND I/N 18) SHALL COMPLY WITH TOLERANCE REQUIREMENTS OF ASME CODE, SECTION III, DIVISION 1, SUBSECTION NE, ARTICLE NE-4220.
17. O-RING MATERIAL, ACCEPTANCE TESTS, AND ACCEPTABLE DEVIATIONS IN PROPERTIES ARE PER SECTION 8.1.5.2 OF THE SAFETY ANALYSIS REPORT.
18. ELECTROLESS NICKEL PLATE TO A THICKNESS OF .0005 - .0010 INCHES IN ACCORDANCE WITH SAE-AMS 2404, REVISION F, CLASS 1 OR MIL-DTL-26074, REVISION F, CLASS 1, GRADE B.
19. PRIOR TO ASSEMBLY, OPTIONALLY COAT EACH O-RING WITH A THIN COAT OF VACUUM GREASE.
20. TIGHTEN CLOSURE BOLTS TO A TORQUE OF 200-240 FT-LB, USING A CROSSING PATTERN. COAT THREADS WITH A LOW-HALOGEN, NICKEL BASED NUCLEAR GRADE LUBRICANT PRIOR TO ASSEMBLY.
21. TIGHTEN PORT PLUG BOLT TO 8-10 FT-LB TORQUE.
22. TIGHTEN DRAIN PLUG BOLT TO 18-22 FT-LB TORQUE.
23. THE DESIGN PRESSURE IS 25 PSIG. THE CONTAINMENT BOUNDARY SHALL BE PRESSURE TESTED TO A MINIMUM OF 125% OF THE DESIGN PRESSURE AS REQUIRED BY SECTION 8.1.3.2 OF THE SAFETY ANALYSIS REPORT.
24. THE CONTAINMENT BOUNDARY SHALL BE LEAKAGE RATE TESTED TO DEMONSTRATE A LEAKAGE RATE NOT TO EXCEED 1.0E-7 REFERENCE CUBIC CENTIMETERS PER SECOND, AIR, PER ANSI N14.5, AS REQUIRED BY SECTION 8.1.4 OF THE SAFETY ANALYSIS REPORT.
25. A SHIELDING INTEGRITY TEST SHALL BE PERFORMED PER SECTION 8.1.6 OF THE SAFETY ANALYSIS REPORT.
26. LABEL TO BE MACHINED ENGRAVE, IMPRESSION STAMP, OR EQUIVALENT, CHARACTERS 3/8-INCH HIGH MINIMUM.
27. AN ANNULAR REGION OF LEAD UP TO 1/2 INCH SQUARE MAY BE REMOVED ADJACENT TO THE WELD TO PREVENT LEAD CONTAMINATION. SPACE MAY BE FILLED WITH CERAMIC ROPE OR EQUIVALENT. A WELD BACKING BAR MAY BE USED.
28. EXCEPT AS INDICATED, AND EXCLUDING SEAL, TACK, AND INTERMITTENT WELDS, AND ASSEMBLY A4, ALL WELDS SHALL BE LIQUID PENETRANT INSPECTED ON THE FINAL PASS IN ACCORDANCE WITH ASME CODE, SECTION III, DIVISION 1, SUBSECTION NF, ARTICLE NF-5000, AND SECTION V, ARTICLE 6.
29. LEAD SHEETS SHALL BE ULTRASONICALLY INSPECTED TO ENSURE NO VOIDS GREATER THAN 10% OF SHEET THICKNESS. SHEETS SHALL FILL THE CAVITY AND BE TIGHTLY FIT AND FORCEFULLY INSTALLED. ALL REMAINING GAPS SHALL BE PACKED WITH FITTED LEAD SCRAPS OR COMPRESSED LEAD WOOL.
30. THREAD INSERTS ARE OPTIONAL.
31. INSTALL ITEM 31 (PIPE) AFTER FINAL CLOSURE WELD OF SHIELD PLUG COMPLETED.
32. FOR UNDIMENSIONED FILLET WELDS, THE MINIMUM FILLET WELD LEG SIZE IS EQUAL TO THE THICKNESS OF THE THINNER BASE METAL BEING JOINED.
33. SPACERS, MADE FROM 12-GAUGE SHEET METAL (I/N 21), ARE LOCATED AS REQUIRED AROUND OUTER SHELL OD TO MAINTAIN GAP BETWEEN THERMAL SHIELD AND CASK BODY. SPACERS MAY BE ATTACHED USING CONTINUOUS OR INTERMITTENT FILLET WELDS.
34. PLATE THICKNESS GREATER THAN THOSE SPECIFIED IN THE LIST OF MATERIAL MAY BE USED IN ORDER TO ENSURE THE MINIMUM MILL PLATE THICKNESS AFTER MACHINING.
35. WEATHER SEAL MAY BE INSTALLED BETWEEN THE BRR CASK ASSEMBLY (ITEM A2) AND THE LOWER IMPACT LIMITER ASSEMBLY (ITEM 2).

(CONTINUED ON SHEET 3)

LIST OF MATERIALS

A4	A3	A2	A1	ITEM NO	PART NO	DESCRIPTION	SPECIFICATION
			X	A1		BRR PACKAGE ASSEMBLY	
		X		1 A2		BRR CASK ASSEMBLY	
	X			1 A3		SHIELD PLUG	
X				1 A4		PERSONNEL BARRIER ASSEMBLY	
				1	1910-01-02-SAR-A1	UPPER IMPACT LIMITER ASSEMBLY	
				1 2	1910-01-02-SAR-A2	LOWER IMPACT LIMITER ASSEMBLY	
				16 3	CL-16-BLPT	BALL LOCK PIN, 1 DIA, STAINLESS STEEL	CARR LANE OR EQUIV
[17]			1		4	O-RING, 17.88 +/- 1% ID X .375 +/- .007	BUTYL, RAINIER RUBBER R0405-70
[17]			1		5	O-RING, 20.125 +/- 1% ID X .375 +/- .007	BUTYL, RAINIER RUBBER R0405-70
[17]			2		6	NAS 1523C6N	SEALING WASHER, .38 ID BUTYL, RAINIER RUBBER R0405-70
[17]			1		7	NAS 1523C10N	SEALING WASHER, .63 ID BUTYL, RAINIER RUBBER R0405-70
			12		8		WASHER, .17 THK X 1.06 ID X 1.6 OD ASTM A564, GRADE 630, COND H1025
			1		9		DUST COVER, BODY ASTM B16 UNS C36000, H02 TEMPER
			2		10		DUST COVER, LID ASTM B16 UNS C36000, H02 TEMPER
			1		11		ALIGNMENT PIN, .75 DIA ASTM A276, UNS S21800
[18]			12		12		SHCS, 1-8UNC-2A X 2.5 LG ASTM A320, TYPE L43
			1		13		SHCS, 5/8-11UNC-2A ASTM B16 UNS C36000, H02 TEMPER
			2		14		SHCS, 3/8-16UNC-2A ASTM B16 UNS C36000, H02 TEMPER
[14] [12]			1		15		CASTING, UPPER BODY ASTM A351, GR CF8A OR ASTM A182, GRADE F304
[14] [12]			1		16		CASTING, LOWER BODY ASTM A351, GR CF8A OR ASTM A182, GRADE F304
[14] [12]			1		17		CASTING, INNER SHELL ASTM A451, GR CPF8A OR ASTM A182, GRADE F304
[34] [15]			1		18		PLATE, OUTER SHELL, 2.0 THK ASTM A240, TYPE 304 OR ASTM A182 GRADE F304 OR ASTM A451, GRADE CPF8A
			1		19		ANGLE, 1 X 1 X 1/8 ASTM A276, TYPE 304
[11]			AR		20		LEAD, POURED ASTM B29
			AR		21		SHEET, .105 THK (12 GA) ASTM A240, TYPE 304
[11]		AR	AR		22		LEAD, SHEET ASTM B29
		1	AR		23		PLATE, 1.0 THK ASTM A240, TYPE 304
			16		24	KNH1608JMX-SY	HEAVY DUTY INSERT, 1-8UNC-2B X 1.4 LG KEENSERT OR EQUIV

REVISION HISTORY

REV	DESCRIPTION
7	SEE ECN NO. 1910-01-01-SARR6-E1
6	SEE ECN NO. 1910-01-01-SARR5-E1, E2 & E3
5	SEE ECN NO. 1910-01-01-SARR4-E1 & E2
4	SEE ECN NO. 1910-01-01-SARR3-E1
3	SEE ECN NO. 1910-01-01-SARR2-E1
2	SEE ECN NO. 1910-01-01-SARR1-E1
1	SEE ECN NO. 1910-01-01-SARR0-E1

			NAME/SIGNATURE	DATE
		EM	D Hilleson D Hilleson	11/13/18
		RE	P Ness Pat Ness	11/13/18
		TECH CHK	P Ness Pat Ness	11/13/18
NA	NA	DFTG CHK	T.E. MACKIN T.E. Mackin	11/13/18
NEXT ASSY	FINAL ASSY	DRAWN	Q. LE	11/12/2018
THIRD ANGLE PROJECTION		UNLESS OTHERWISE SPECIFIED: INTERPRET DRAWINGS & TOLERANCES PER ASME Y14.5-2009 (REVISION OF ASME Y14.5M-1994) INTERPRET WELD CALLOUTS PER ANSI/AWS A2.4 DIMENSIONS ARE IN INCHES		

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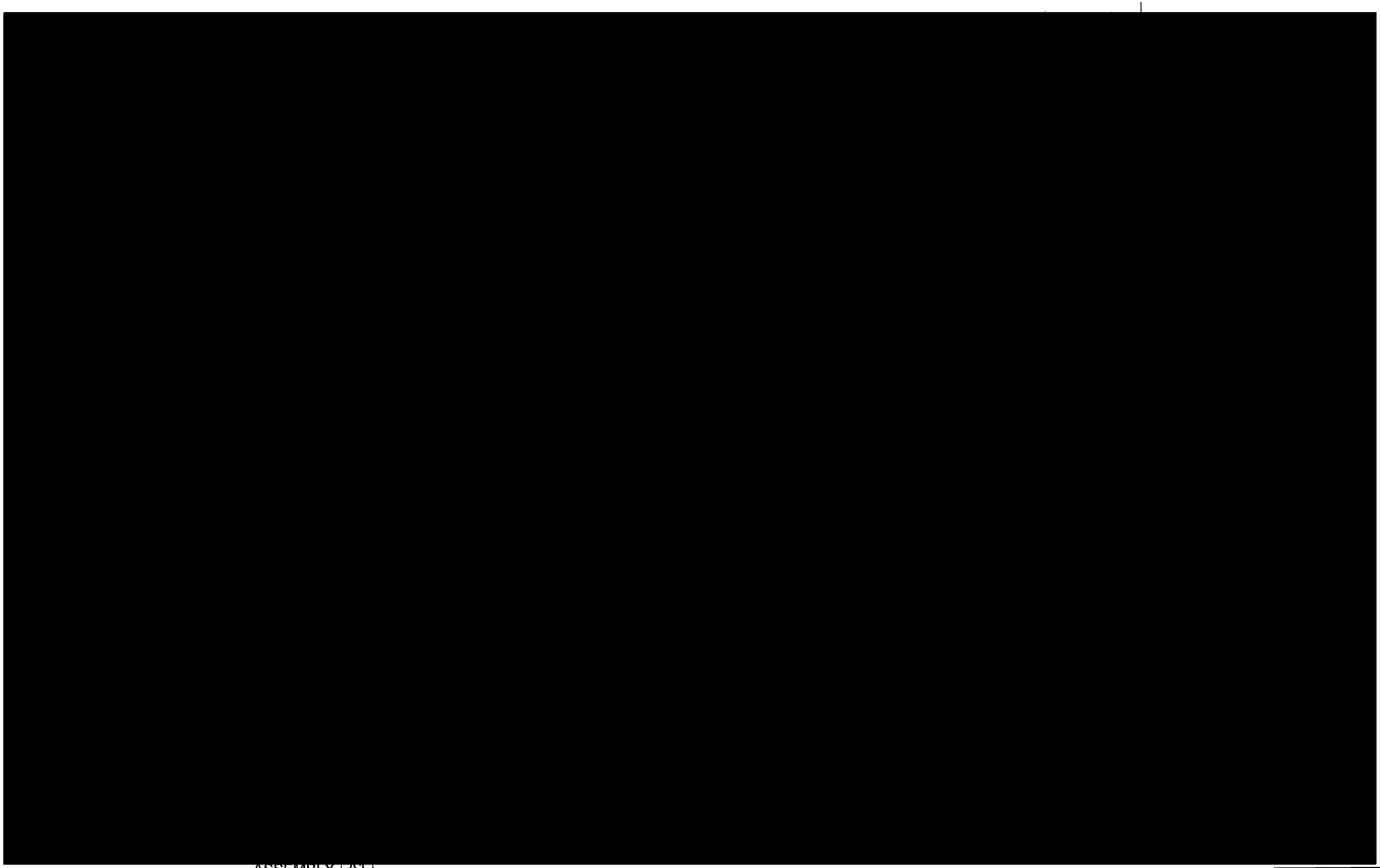
Packaging Projects
Federal Way, WA 98003

DWG TITLE: BRR PACKAGE ASSEMBLY SAR DRAWING

MACHINE TOLERANCES: FRACTION ± 1/4, ANGLES ± 2°, 2 PLACE DECIMAL ± .05, 1 PLACE DECIMAL ± .2
WELD & FORMED TOLERANCES: FRACTION ± 1/4, ANGLES ± 2°, 2 PLACE DECIMAL ± .12, 1 PLACE DECIMAL ± .3

SCALE: NOTED | WT. ~ LBS
REV: 7 | SHEET 1 OF 5
DWG SIZE: D | DWG NO. 1910-01-01-SAR
CADFILE: 19100101SAR7.SLDDRW
DWG - 3001275-007



ASSEMBLY A1
SCALE: 1/8

[redacted]

LIST OF MATERIALS (CONTINUED)

	A4	A3	A2	A1	ITEM NO	PART NO	DESCRIPTION	SPECIFICATION
		1	32		25		PLATE, 1/2 THK	ASTM A240, TYPE 304
34			1		26		PLATE, 2.0 THK	ASTM A240, TYPE 304
30		1		3	27	KNH813J	HEAVY DUTY INSERT, 1/2-13UNC-2B X .7 LG	KEENSERT OR EQUIV
		1			28		PLATE, 1 1/2 THK	ASTM A240, TYPE 304
		1			29		PLATE, 3/8 THK	ASTM A240, TYPE 304
		1			30		BAR, RD, 1.5 DIA	ASTM A276, TYPE 304
		1			31		PIPE, 3/4 SCH 40S	ASTM A312 OR A376, GR TP304
36	AR				32		EXPANDED SHEET, 3/4 #13	ASTM F1267, TYPE I OR TYPE II CLASS 3
	AR				33		SHEET, .135 (10 GA)	ASTM A240, TYPE 304
	16				34		SEAMLESS TUBE, Ø1 OD X .25 WALL	ASTM A511 GR MT304
	8				35		ANGLE, 1 X 1 X 1/8 THK	ASTM A276, TYPE 304
	32				36		PLASTIC PAD	ACETAL
	64				37		FLAT HEAD SCREW, 1/4-20 UNC-2A	STAINLESS STEEL
	8				38		PAD, .5 THK	FOAM RUBBER
	8				39		SHCS, 3/8-16 UNC-2A	STAINLESS STEEL
	16				40		FLAT WASHER, Ø3/8 NOM.	STAINLESS STEEL
	8				41		LOCK WASHER, Ø3/8 NOM.	STAINLESS STEEL
	8				42		HEX NUT, 3/8-16 UNC	STAINLESS STEEL

[redacted]

XPANDED METAL.
NCE OF ITEM HAS

SIVE DESIGNED

PE TARGETS ONLY.

O TO EDGE STRIPS

SCALE: 1/1

REV: 7 | SHEET 3 OF 5
DWG NO.
1910-01-01-SAR

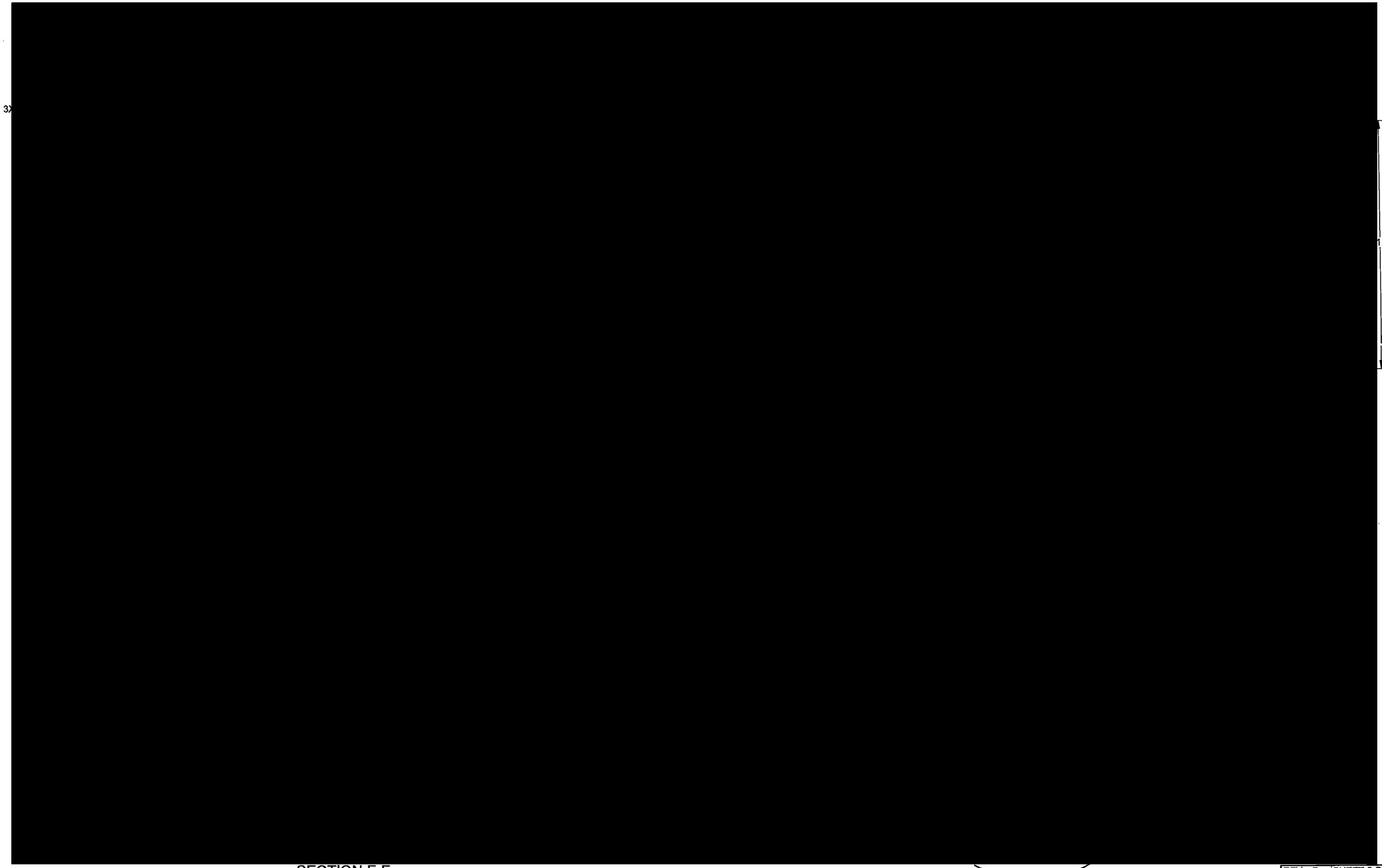
D

C

B

A

[redacted]



SECTION F-F
SCALE: 1/2

REV: 7 | SHEET 5 OF 5
DWG NO.
1910-01-01-SAR