71-9253

TRANSNUCLEAR, INC.

March 1, 2002
E-19389

Mr. E. William Brach, Project Director
U. S. Nuclear Regulatory Commission
Spent Fuel Project Office
One White Flint North
11555 Rockville Pike
Washington, DC 20555

Subject: TN-FSV Safety Analysis Report
Docket No. 71-9253

Dear Mr. Brach:

On behalf of the DOE, Transnuclear is requesting an amendment to the C of C for the TN-FSV Packaging. Enclosed are revised TN-FSV SAR drawings and revised pages for the TN-FSV cask and for the Oak Ridge Container (ORC) SAR Addendum. The drawing revisions and their justifications are discussed below.

ORC SAR Addendum
Drawings 3044-70-1, Rev 4; 3044-70-2, Rev 2; 3044-70-3, Rev 2; 3044-70-4, Rev 1; and page 1-28, Rev 4

a) The words *tack weld item 20 to item 19* in Note 6 on drawing 3044-70-4, Rev 0 have been replaced by the words *stake or pin item 19 to item 17A*. Item 19 is a high strength hardened stainless steel material that is not readily weldable. Therefore, we have deleted the tack weld of the nut (item 20) to the rod (item 19). Instead, the rod is pinned or staked to the top basket plate and the nut welded to the bottom basket plate which will maintain the pre-load in the rod/nut as desired.

b) Item #30 in the Part List on drawing 3044-70-1, Rev 3 material was shown as SB-209 aluminum. The material has been changed to B-209 aluminum. Item #30 is used only as a spacer sleeve and serves no other function. The change to ASTM B-209 allows more flexibility in procurement of the aluminum plate that must be formed into the cylindrical sleeve.

c) Note 1 on drawings 3044-70-2, and –3, Rev 1 mistakenly referred to drawing 3044-30-1. Note 1 has been revised to correctly refer to drawing 3044-70-1.

FOUR SKYLINE DRIVE, HAWTHORNE, NEW YORK 10532
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NMSS01 Public

d) The Parts List in drawing 3044-70-1, Rev 3 currently shows the description for items #7 and #8 as *3/16" dia x 17.340" I.D.* and *3/16" dia x 16.374" I.D.* respectively. To allow procurement flexibility, we have added a "standard" Parker O-ring size to each description. The O-ring cross section and the material remain the same, only the I.D. of the O-ring is allowed to be smaller than the custom size currently specified. For item #7, Parker O-ring designation 2-386 has been added and for item #8, Parker O-ring designation 2-385 has been added. As can be seen from the attached Parker O-ring Handbook Table, the I.D. for 2-386 is 16.955" and for 2-385, the I.D. is 15.955". The only difference in the use of the custom and "standard" O-ring is that the stretch for the standard O-ring will be more than the custom size O-ring. We have checked with Parker and confirmed that the stretch for both the custom and standard O-rings are meet the 5% guideline recommended by Parker. Also, the squeeze for both O-rings is well within the Parker recommendation. Obviously, the real justification of the O-rings will be in the successful completion of the leak test and their successful performance during the shipments.

TN-FSV SAR
Drawing 1090-SAR-5, Rev 4, and page 1-18, Rev 4

a) The Parts List in drawing 1090-SAR-5, Rev 3 currently shows the description for items #10 and #11 as *.275"φ x-sect x 21.00" I.D.* and *.275"φ x-sect x 22.75"I.D.*, respectively. To allow procurement flexibility, we have added a "standard" Parker O-ring size to each description. The O-ring cross section and the materials for Configurations 1 and 2 remain the same, only the I.D. of the O-ring is allowed to be smaller than the custom size currently specified. For item #10, Parker O-ring designation 2-470 has been added and for item #11, Parker O-ring designation 2-471 has been added. As shown in the Parker Table, the I.D. for 2-470 is 20.955" and for 2-471 the I.D. is 21.955". The discussion above is also applicable for these O-rings.

Transnuclear requests the COC for the TN-FSV be amended to incorporate the revised drawings.

If you have any questions, please call me.

Sincerely,

Michael Mason

Michael Mason
Chief Engineer

enclosure: as stated above (3 copies)

cc: Brian DeMonia (DOE) 1 copy

Design Table 4-1 — Gland Dimensions for Industrial O-Ring Static Seals, 103.5 Bar (1500 PSI) Max.† *(Continued)*

O-Ring Size Parker No. 2-	Dimensions ID	±	W	Mean OD (Ref)	A Bore Dia. (Male Gland) +.002 -.000	A-1 Groove Dia. (Female Gland) -.000	+	B Tube OD (Female Gland) +.000 -.002	B-1 Groove Dia. (Male Gland) +.000	-	C Plug Dia. (Male Gland) +.000 .001	D Throat Dia. (Female Gland) +.001 -.000	G† Groove Width +.005 -.000
359	5.725	.037		6.145	6.125	6.090		5.750	5.785		6.122	5.753	
360	5.850	.037		6.270	6.250	6.215		5.875	5.910		6.247	5.878	
361	5.975	.037		6.395	6.375	6.340		6.000	6.035		6.372	6.003	
362	6.225	.040		6.645	6.625	6.590		6.250	6.285		6.622	6.253	
363	6.475	.040		6.895	6.875	6.840		6.500	6.535		6.872	6.503	
364	6.725	.040		7.145	7.125	7.090		6.750	6.785		7.122	6.753	
365	6.975	.040		7.395	7.375	7.340		7.000	7.035		7.372	7.003	
366	7.225	.045		7.645	7.625	7.590		7.250	7.285		7.622	7.253	
367	7.475	.045		7.895	7.875	7.840		7.500	7.535		7.872	7.503	
368	7.725	.045		8.145	8.125	8.090		7.750	7.785		8.122	7.753	
369	7.975	.045		8.395	8.375	8.340		8.000	8.035		8.372	8.003	
370	8.225	.050		8.645	8.625	8.590		8.250	8.285		8.622	8.253	
371	8.475	.050		8.895	8.875	8.840		8.500	8.535		8.872	8.503	
372	8.725	.050		9.145	9.125	9.090		8.750	8.785		9.122	8.753	
373	8.975	.050		9.395	9.375	9.340		9.000	9.035		9.372	9.003	
374	9.225	.055		9.645	9.625	9.590		9.250	9.285		9.622	9.253	
375	9.475	.055		9.895	9.875	9.840		9.500	9.535		9.872	9.503	
376	9.725	.055		10.145	10.125	10.090		9.750	9.785		10.122	9.753	.281
377	9.975	.055	.210	10.395	10.375	10.340	.004	10.000	10.035	.004	10.372	10.003	+.005
378	10.475	.060	±.005	10.895	10.875	10.840		10.500	10.535		10.872	10.503	-.000
379	10.975	.060		11.395	11.375	11.340		11.000	11.035		11.372	11.003	
380	11.475	.065		11.895	11.875	11.840		11.500	11.535		11.872	11.503	
381	11.975	.065		12.395	12.375	12.340		12.000	12.035		12.372	12.003	
382	12.975	.065		13.395	13.375	13.340		13.000	13.035		13.372	13.003	
383	13.975	.070		14.395	14.375	14.340		14.000	14.035		14.372	14.003	
384	14.975	.070		15.395	15.375	15.340		15.000	15.035		15.372	15.003	
385	15.955	.075		16.375	16.375	16.340		16.000	16.035		16.372	16.003	
386	16.955	.080		17.375	17.375	17.340		17.000	17.035		17.372	17.003	
387	17.955	.085		18.375	18.375	18.340		18.000	18.035		18.372	18.003	
388	18.955	.090		19.373	19.375	19.340		19.000	19.035		19.372	19.003	
389	19.955	.095		20.373	20.375	20.340		20.000	20.035		20.372	20.003	
390	20.955	.095		21.373	21.375	21.340		21.000	21.035		21.372	21.003	
391	21.955	.100		22.373	22.375	22.340		22.000	22.035		22.372	22.003	
392	22.940	.105		23.360	23.375	23.340		23.000	23.035		23.372	23.003	
393	23.940	.110		24.360	24.375	24.340		24.000	24.035		24.372	24.003	
394	24.940	.115		25.360	25.375	25.340		25.000	25.035		25.372	25.003	
395	25.940	.120		26.360	26.375	26.340		26.000	26.035		26.372	26.003	
425	4.475	.033		5.025	5.000	4.952		4.500	4.548		4.996	4.504	
426	4.600	.033		5.150	5.125	5.077		4.625	4.673		5.121	4.629	.375
427	4.725	.033	.275	5.275	5.250	5.202	.004	4.750	4.798	.004	5.246	4.754	+.005
428	4.850	.033	±.006	5.400	5.375	5.327		4.875	4.923		5.371	4.879	-.000
429	4.975	.037		5.525	5.500	5.452		5.000	5.048		5.496	5.004	
430	5.100	.037		5.650	5.625	5.577		5.125	5.173		5.621	5.129	
431	5.225	.037		5.775	5.750	5.702		5.250	5.298		5.746	5.254	

† This groove width does not permit the use of Parbak rings. For pressures above 103.5 Bar (1500 PSI), consult Design Chart 4-1 for groove widths where back-up rings must be used.

* These designs require considerable installation stretch. If assembly breakage is incurred, use a compound having higher elongation or use a two-piece piston.

Design Table 4-1: Gland Dimensions for Industrial O-Ring Static Seals, 103.5 Bar (1500 PSI) Max.

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 40512
Phone: (606) 269-2351 • Fax: (606) 268-3616

Design Table 4-1 — Gland Dimensions for Industrial O-Ring Static Seals, 103.5 Bar (1500 PSI) Max.† *(Continued)*

O-Ring Size Parker No. 2-	Dimensions ID	±	W	Mean OD (Ref)	A Bore Dia. (Male Gland) +.002 -.000	A-1 Groove Dia. (Female Gland) -.000	+	B Tube OD (Female Gland) +.000 -.002	B-1 Groove Dia. (Male Gland) +.000	-	C Plug Dia. (Male Gland) +.000 .001	D Throat Dia. (Female Gland) +.001 -.000	G† Groove Width +.005 -.000
432	5.350	.037		5.900	5.875	5.827		5.375	5.423		5.871	5.379	
433	5.475	.037		6.025	6.000	5.952		5.500	5.548		5.996	5.504	
434	5.600	.037		6.150	6.125	6.077		5.625	5.673		6.121	5.629	
435	5.725	.037		6.275	6.250	6.202		5.750	5.798		6.246	5.754	
436	5.850	.037		6.400	6.375	6.327		5.875	5.923		6.371	5.879	
437	5.975	.037		6.525	6.500	6.452		6.000	6.048		6.496	6.004	
438	6.225	.040		6.775	6.750	6.702		6.250	6.298		6.746	6.254	
439	6.475	.040		7.025	7.000	6.952		6.500	6.548		6.996	6.504	
440	6.725	.040		7.275	7.250	7.202		6.750	6.798		7.246	6.754	
441	6.975	.040		7.525	7.500	7.452		7.000	7.048		7.496	7.004	
442	7.225	.045		7.775	7.750	7.702		7.250	7.298		7.746	7.254	
443	7.475	.045		8.025	8.000	7.952		7.500	7.548		7.996	7.504	
444	7.725	.045		8.275	8.250	8.202		7.750	7.798		8.246	7.754	
445	7.975	.045		8.525	8.500	8.452		8.000	8.048		8.496	8.004	
446	8.475	.055		9.025	9.000	8.952		8.500	8.548		8.996	8.504	
447	8.975	.055		9.525	9.500	9.452		9.000	9.048		9.496	9.004	
448	9.475	.055		10.025	10.000	9.952		9.500	9.548		9.996	9.504	
449	9.975	.055		10.525	10.500	10.452		10.000	10.048		10.496	10.000	
450	10.475	.060		11.025	11.000	10.952		10.500	10.548		10.996	10.504	
451	10.975	.060		11.525	11.500	11.452		11.000	11.048		11.496	11.004	
452	11.475	.060		12.025	12.000	11.952		11.500	11.548		11.996	11.504	
453	11.975	.060		12.525	12.500	12.452		12.000	12.048		12.496	12.004	.375
454	12.475	.060	.275	13.025	13.000	12.952	.004	12.500	12.548	.004	12.996	12.504	+.005
455	12.975	.060	±.006	13.525	13.500	13.452		13.000	13.048		13.496	13.004	-.000
456	13.475	.070		14.025	14.000	13.952		13.500	13.548		13.996	13.504	
457	13.975	.070		14.525	14.500	14.452		14.000	14.048		14.496	14.004	
458	14.475	.070		15.025	15.000	14.952		14.500	14.548		14.996	14.504	
459	14.975	.070		15.525	15.500	15.452		15.000	15.048		15.496	15.004	
460	15.475	.070		16.025	16.000	15.952		15.500	15.548		15.996	15.504	
461	15.955	.075		16.505	16.500	16.452		16.000	16.048		16.496	16.004	
462	16.455	.075		17.005	17.000	16.952		16.500	16.548		16.996	16.504	
463	16.955	.080		17.505	17.500	17.452		17.000	17.048		17.496	17.004	
464	17.455	.085		18.005	18.000	17.952		17.500	17.548		17.996	17.504	
465	17.955	.085		18.505	18.500	18.452		18.000	18.048		18.496	18.004	
466	18.455	.085		19.005	19.000	18.952		18.500	18.548		18.996	18.504	
467	18.955	.090		19.505	19.500	19.452		19.000	19.048		19.496	19.004	
468	19.455	.090		20.005	20.000	19.952		19.500	19.548		19.996	19.504	
469	19.955	.095		20.505	20.500	20.452		20.000	20.048		20.496	20.004	
470	20.955	.095		21.505	21.500	21.452		21.000	21.048		21.496	21.004	
471	21.955	.100		22.505	22.500	22.452		22.000	22.048		22.496	22.004	
472	22.940	.105		23.490	23.500	23.452		23.000	23.048		23.496	23.004	
473	23.940	.110		24.490	24.500	24.452		24.000	24.048		24.496	24.004	
474	24.940	.115		25.490	25.500	25.452		25.000	25.048		25.496	25.004	
475	25.940	.120		26.490	26.500	26.452		26.000	26.048		26.496	26.004	

† This groove width does not permit the use of Parbak rings. For pressures above 103.5 Bar (1500 PSI), consult Design Chart 4-1 for groove widths where back-up rings must be used.

* These designs require considerable installation stretch. If assembly breakage is incurred, use a compound having higher elongation or use a two-piece piston.

Design Table 4-1: Gland Dimensions for Industrial O-Ring Static Seals, 103.5 Bar (1500 PSI) Max.

Parker Hannifin Corporation • O-Ring Division
2360 Palumbo Drive, Lexington, KY 45012
Phone: (606) 269-2351 • Fax: (606) 268-3616
www.parker.com/o-ring

Parker Seals
Build With The Best!

1.3 APPENDIX

TN-FSV DRAWINGS/DOCUMENTS

DRAWING/DOCUMENT NO.	TITLE	REVISION
1090-SAR-1	TN-FSV Packaging - Assembly	3
1090-SAR-2	Shell Assembly	3
1090-SAR-3	Details and Shell Parts List	3
1090-SAR-4	Shell Details	3
1090-SAR-5	Lid Assembly and Parts List	4
1090-SAR-6	Front Impact Limiter Assembly	3
1090-SAR-7	Front Impact Limiter Details & Parts List	3
1090-SAR-8	Rear Impact Limiter Assembly	3
1090-SAR-9	Rear Impact Limiter Details & Parts List	3
1090-SAR-10	Impact Limiter Attachment Bolt	2

FIGURE WITHHELD UNDER 10 CFR 2.390

NO.	DATE	REVISIONS	DWN.	CHK'D.	PROJ.

APPROVALS	DATE	
G.G. PROJ.	11 MAR. 93	TRANSNUCLEAR, INC. HAWTHORNE, N.Y.
T.J.N. CHK'D. BY	11 MAR. 93	TN-FSV PACKAGING LID ASSEMBLY AND PARTS LIST
J.T.G. DWN. BY.	27 JAN. 93	AS NOTED SCALE · B SIZE · 1090-SAR-5 DWG. NO. · 4 REV.

1.4 Appendix

Oak Ridge Container Drawings

Drawing No.	Title	Revision
3044-70-1	Oak Ridge Container, General Arrangement	4
3044-70-2	Oak Ridge Container, Container Weldment	2
3044-70-3	Oak Ridge Container, Details	2
3044-70-4	Oak Ridge Container, Assembly Details	1
3044-70-5	Oak Ridge Container, Poison Enclosure Details	2
3044-70-6	Oak Ridge Container, Lid Details	1
3044-70-7	Oak Ridge Container, Details	1
3044-70-8	Oak Ridge Container, Loading Arrangements	0
3044-70-9	Oak Ridge Container ASME Code Compliance and Exceptions	0
X3E020566A175	ORNL SNF Program Oak Ridge Canister SAR Information	0

FIGURE WITHHELD UNDER 10 CFR 2.390

APPROVALS	DATE
M.M. PROJ.	01 NOV. 00
W.R.S. Q/A	02 NOV. 00
J.C. MECH. ENG.	01 NOV. 00
M.M. CHK'D. BY	01 NOV. 00
J.T.G. DWN. BY.	24 OCT. 00

TRANSNUCLEAR, INC.
HAWTHORNE, N.Y.

OAK RIDGE CONTAINER
GENERAL ARRANGEMENT

SAR

NONE SCALE	B SIZE	3044-70-1 DWG. NO.	4 REV.

FIGURE WITHHELD UNDER 10 CFR 2.390

APPROVALS	DATE
MM PROJ.	1 NOV. 00
WRS Q/A	2 NOV. 00
JC MECH. ENG.	1 NOV. 00
MM CHK'D. BY	1 NOV. 00
JTG DWN. BY.	24 OCT. 00

TRANSNUCLEAR, INC.
HAWTHORNE, N.Y.

OAK RIDGE CONTAINER
CONTAINER WELDMENT

NONE	B	3044-70-2	SAR 2
SCALE	SIZE	DWG. NO.	REV.

FIGURE WITHHELD UNDER 10 CFR 2.390

APPROVALS	DATE
MM PROJ.	1 NOV. 00
WRS Q/A	2 NOV. 00
JC MECH. ENG.	1 NOV. 00
MM CHK'D. BY	1 NOV. 00
JTG DWN. BY.	24 OCT. 00

TRANSNUCLEAR, INC.
HAWTHORNE, N.Y.

OAK RIDGE CONTAINER DETAILS

NONE SCALE	B SIZE	3044-70-3 DWG. NO.	SAR 2 REV.

FIGURE WITHHELD UNDER 10 CFR 2.390

NO.	DATE	REVISIONS	DWN.	CHK'D.	M.E.	Q/A	PROJ.
1	3/6/01	SEE DCN 3044-41	RJV		DS		

APPROVALS	DATE
M.M. PROJ.	1 NOV. 00
W.R.S Q/A	2 NOV. 00
J.C. MECH. ENG.	1 NOV. 00
M.M. CHK'D. BY	1 NOV. 00
J.T.G. DWN. BY.	24 OCT. 00

TRANSNUCLEAR, INC.
HAWTHORNE, N.Y.

OAK RIDGE CONTAINER
ASSEMBLY DETAILS

SAR

NONE	B	3044-70-4	1
SCALE	SIZE	DWG. NO.	REV.