

71-9253



Public Service
Company of Colorado

16805 Weld County Road 19 1/2; Platteville, CO. 80651

September 11, 1995
Fort St. Vrain
P-95080

Mr. Cass R. Chappell, Section Leader
Cask Certification Section
Storage and Transport Systems Branch
Division of Industrial and
Medical Nuclear Safety, NMSS
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Docket No. 71-9253

SUBJECT: Request for Amendment to the Certificate of Compliance of
the TN-FSV Spent Fuel Shipping Cask to Revise Drawings in
SAR and Reflect Revisions to Cask Operating Procedure

REFERENCE: NRC Letter, Chappell to Warembourg, dated June 15,
1994 (G-94110)

Dear Mr. Chappell:

The NRC issued the Certificate of Compliance No. 9253 (C of C) for the TN-FSV spent fuel shipping package to Public Service Company of Colorado (PSCo) in the referenced letter. Section 5.(a)(3) of this C of C requires that the packaging be constructed and assembled in accordance with ten Transnuclear, Inc. drawings, 1090-SAR-1 through 1090-SAR-10, all Rev. 1. The purpose of this letter is to request an amendment to the C of C to reflect revisions to nine of these drawings (1090-SAR-1 through -9).

Revisions to the drawings were necessary to correct the location of the lifting points on the impact limiters. The impact limiters/cask were rotated so that the impact limiter lifting lugs are at the top of the cask, instead of the side of the cask as shown on the Rev. 1 drawings. The drawings have been corrected to show the orientation of the affected bolt holes, lifting lugs, etc. Rotation of the impact limiters with respect to the cask and changing the position of the impact limiter lifting lugs does not affect the design of the cask or impact limiters.

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Attachment 1 to this letter identifies and explains changes to the nine drawings requiring revision, with most changes stemming from the rotation of each impact limiter. Other drawing changes were made to reflect the as-built cask design, and are also described in Attachment 1. The enclosure to this letter contains the revised (Rev. 2) drawings.

Attachment 2 contains revised pages of the TN-FSV SAR, Section 7. This SAR section delineates TN-FSV cask loading and handling procedure guidelines which show the general approach to cask operational activities. Section 7 is being revised to reflect upgrades and corrections identified in the "dry run" testing of empty TN-FSV casks when the newly fabricated casks arrived on-site. The revisions affect the summaries of the pressure rise leak tests in Section 7, which have been changed to require an initial vacuum of equal to or greater than 60 cm. mercury (Hg), instead of the previous requirement of 10 mbar pressure, equivalent to approximately 63 cm. Hg vacuum. While the FSV leak test equipment cannot consistently and reliably attain the 63 cm. Hg vacuum, a 60 cm. Hg vacuum is within its capability, and is considered to provide an adequate pressure rise leak test. The required sensitivity and acceptance criteria of the leak tests are not affected by these revisions.

Should you have any questions on this information, please contact Mr. M. H. Holmes at (303) 620-1701.

Sincerely,



M. J. Fisher
Decommissioning Program Director
and ISFSI Manager

MJF/JRJ

Attachments
Enclosure

cc: Regional Administrator, Region IV

Mr. Robert M. Quillin, Director
Radiation Control Division
Colorado Department of Public Health and Environment

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ATTACHMENT 1

DESCRIPTION OF CHANGES TO TN-FSV SAFETY ANALYSIS REPORT DRAWINGS 1090-SAR-1 THROUGH 1090-SAR-9 (REV. 2)

TN-FSV SAR DRAWING CHANGES (Rev. 1 to Rev. 2)

Dwg. 1090-SAR-1

Longitudinal Section: Deleted lifting lug and pad on both impact limiters. Added "Rotated into Section" to lifting socket, trunnion callouts, bolt tunnels, and alignment pin. Drain callout "rotated into section" was "rotated into view". "Longitudinal section" was "Elevation view". Callout for Items 6,7 "Rotated into Section" was "Rotated into View"


Blow up of Items 6,7: Minor picture change

Section A-A : Rotated 30° the following: gussets, bolt cutouts, test port plug, vent cover, lifting lug, alignment pins. Removed center lifting lug and pad.

Section B-B : Rotated 30° the following; gussets, bolt tunnels, lifting lugs. Removed center lifting lug and pad. Rotated trunnions 90° to the 90° and 270° locations.

Dwg. 1090-SAR-2

Half Section View: Moved Item 27 to 90° location from 180° location. Added "Lifting Socket Rotated into Section". Added "Trunnion rotation into section". Redrew lifting socket and trunnion 90° axis. "Drain rotated into section" was "drain rotated into view".

View A-A : Rotated impact limiter bolt holes 30° (1-1/4" threaded holes). Rotated security seal hole (.188"Ø) to 70° location. Removed "straddle  on impact limiter bolt holes dimension. Redrew trunnions on 90° and 270° location

Section B-B : Redrew lifting sockets on 90° and 270° location

Section C-C : Redrew trunnions on 90° and 270° location

Note 9 : 90° was 180°

Dwg. 1090-SAR-3

View D : .188" dia. holes in lid recess at $7\frac{1}{2}^\circ$, $97\frac{1}{2}^\circ$, $187\frac{1}{2}^\circ$ and $277\frac{1}{2}^\circ$ was 0° , 90° , 180° , 270° . Added to view title "drain holes rotated into view".

Item 12 & 16 (lifting sockets): Added top view.

Parts List : Item 13 (socket head cap screw) length 1.50" was 1.75"

Dwg. 1090-SAR-4

View H-H : Redrew trunnions at 90° and 270° location. Rotated -30° the following; impact limiter bolt holes ($1\frac{1}{4}$ " threaded holes), alignment pin holes ($1.062\text{"}\varnothing$ hole) and drain flat (5.50" flat). Removed "straddle Φ " on impact limiter holes dimension.

Detail G : In title of view " 30° location" was " 60° location".

Note 6 : Changed note to "if this weld is to be made" was "this weld to be made".

Item 27 (regulatory plate): Changed "Transnuclear, Inc., Hawthorne, NY USA" to "Public Service Company, Denver, Colorado USA".

Item 10 (canister insert): Chamfer 0.38" x 0.38" was 0.19" x 0.19".

Dwg. 1090-SAR-5

Lid Assembly View: Rotated 30° the following; impact limiter cutouts, alignment pin holes ($1.062\text{"}\varnothing$), Item 8 (test port and penetration), Item 3 (vent cover and penetration).

View E-E : Location 330° was 300° .

Section A-A : Added cutout for impact limiter bolt, removed alignment pin hole, spacer diameter 17.63" was 18.38".

Dwg. 1090-SAR-6

- View B-B : Rotated the following 30°; outer gussets, bolt tunnel; fusible plugs, removed center lifting lug and pad, rotated center gusset 90°, rotated 30° lifting lugs and pads.
- Section A-A : Removed center lifting lug and pad, moved outer lifting lug and pad to C.G. of impact limiter.
- View C-C : Rotated the following 30°, bolt tunnels, alignment pins, lifting lugs, removed center lifting lug and pad, rotated Item 32 (security support plate) - 20° to 70° location, change size of Item 32, deleted Item 33, 3.00" dimension (support pad location) was 2.50".
- Detail D : 30° and 217.5° location was 0° and 187.5°.
- Detail W : Redrew to reflect Item 32 change.

Added Section X-X

Dwg. 1090-SAR-7

Deleted Detail W

- Detail S : 6.00" dimension was 5.00", Scale of view was 1/8.
- Detail R : 3.81" dimension was 2.88", scale of view was 1/8.
- Parts List : Item 13; No. req'd. "2" was "3"
Item 19; Material....added "or equivalent"
Items 33 , 34 deleted

Dwg. 1090-SAR-8

- View B-B : Rotated the following 30°; outer gussets, bolt tunnels, fusible plugs, lifting lugs, removed center lifting lug, rotated center gusset 90°.
- Section A-A : Removed center lifting lug and pad, moved outer lifting lug and pad to C.G. of impact limiter.

View C-C : Rotated the following 30°; bolt tunnels, alignment pins, lifting lugs, removed center lifting lug and pad, 90° & 270° axis references are reversed, 3.00" dimension (support pad locations) was 2.50".

Detail D : 142.5° and 330° location was 0° and 172.5°

Dwg. 1090-SAR-9

Deleted Detail W

Detail S : 6.00" dimension was 5.00", scale of view was 1/8.

Detail R : 3.81" dimension was 2.88", scale of view was 1/8.

Parts List : Item 13; no. req'd. "2" was "3".
Item 19, material....added or "equivalent".
Item 30 deleted.

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ATTACHMENT 2

**REVISED PAGES OF THE TN-FSV SAFETY ANALYSIS REPORT
INCLUDING SECTION 7, "OPERATING PROCEDURES" (REV.2)**

<u>SECTION</u>	<u>EFFECTIVE PAGES</u>	<u>REVISION NO.</u>
Cover Page	Original	1
List of Effective Pages	1 through 2	2
Table of Contents	i through ii	2
Table of Contents Chapter One	1-i through 1-ii	0
Chapter One, General Information	1-1 through 1-17	0
	1-18	1
	Drawings 1090-SAR-1 through -9	2
	Drawing 1090-SAR-10	1
Chapter Two	2-i through 2-viii	0
Table of Contents		
Chapter Two, Structural Evaluation	2-1 through 2-32	0
	2-32a	1
	2-33 through 2-79	0
	2-79a	0
	2-80 through 2-124	0
Appendix 2.10.1	2.10.1-i	0
	2.10.1-ii	1
	2.10.1-iii through 2.10.1-v	0
	2.10.1-1 through 2.10.1-33	0
	2.10.1-34	1
	2.10.1-35	0
	2.10.1-35a	1
	2.10.1-36	0
	2.10.1-36a	1
	2.10.1-37	0
	2.10.1-37a through 2.10.1-37b	1
	2.10.1-38 through 2.10.1-40	0
	2.10.1-40a	0
	2.10.1-41 through 2.10.1-42	0
	2.10.1-42a	0
	2.10.1-43 through 2.10.1-53	0
	2.10.1-53a	0
	2.10.1-54	0
	2.10.1-54a	0
	2.10.1-55 through 2.10.1-56	0
	2.10.1-56a through 2.10.1-56b	0
	2.10.1-57 through 2.10.1-58	0
	2.10.1-58a through 2.10.1-58b	0
	2.10.1-59 through 2.10.1-64	0
	2.10.1-64a through 2.10.1-64b	0
	2.10.1-65 through 2.10.1-101	0
Appendix 2.10.2	2.10.2.i through 2.10.2-iii	0
	2.10.2-1 through 2.10.2-62	0
Appendix 2.10.3	2.10.3-i through 2.10.3-ii	1
	2.10.3-1 through 2.10.3-40	1
Appendix 2.10.4	2.10.4-i	0
	2.10.4-1 through 2.10.4-15	0

<u>SECTION</u>	<u>EFFECTIVE PAGES</u>	<u>REVISION NO.</u>
Appendix 2.10.5	2.10.5-1 through 2.10.5-5	0
Table of Contents Chapter Three	3-i through 3-iii	0
Chapter Three, Thermal Evaluation	3-1 through 3-31	0
Table of Contents Chapter Four	4-i through 4-ii	0
Chapter Four, Containment	4-1 through 4-12	0
Table of Contents Chapter Five	5-i 5-ii	1 0
Chapter Five, Shielding Evaluation	5-1 5-2 5-3 through 5-3a 5-4 5-5 through 5-12	1 0 1 1 0
Table of Contents Chapter Six	6-i through 6-ii	1
Chapter Six, Criticality Evaluation	6-1 through 6-15	1
Appendix 6.7	6.7-1 through 6.7-6	1
Table of Contents Chapter Seven	7-i	2
Chapter Seven, Operating Procedures	7-1 through 7-10	2
Table of Contents Chapter Eight	8-i	1
Chapter Eight, Acceptance Tests and Maintenance Program	8-1 through 8-2 8-3 through 8-5 8-6 8-7	0 1 0 1

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CHAPTER SEVEN

OPERATING PROCEDURES

This chapter contains TN-FSV loading and handling procedure guidelines which show the general approach to cask operational activities. The information in this chapter will be used to prepare site specific procedures. Operational steps which must be performed to maintain the validity of cask transport regulations and safety analysis conclusions are identified by underlined procedural steps. Some steps may be performed out of the sequence shown below to allow for efficiency in cask handling operations.

The procedures in this section are for those activities associated with the loading and transport of canistered spent fuel elements from the Fort St. Vrain High Temperature Gas Cooled Reactor. The loading shall be performed in the independent spent fuel storage installation and unloading of the cask shall be performed dry, presumably in a hot cell, at a location yet to be determined.

The final steps of cask acceptance testing are performed at the loading site prior to the cask being transported for the initial shipment.

7.1 PROCEDURES FOR LOADING PACKAGE

7.1.1 Receipt of Empty Package

7.1.1.1 Inspect and clean the tractor and semitrailer, removing any road dirt. Check for damage or irregularities and begin performance of radiation and contamination survey. (The radiation and contamination survey continues following removal of the personnel barrier, and as shipping cask surfaces become accessible.)

7.1.1.2 Remove the personnel barrier. Inspect and clean the shipping cask.

- | 7.1.1.3 Remove the impact limiter attachment bolts and remove the front and rear impact limiters using a suitable crane and rigging.
- | 7.1.1.4 Release the trunnion tie-downs.
- | 7.1.1.5 Release and remove the front saddle tie-down.
- | 7.1.1.6 Back the semitrailer into the truck bay.
- 7.1.1.7 Engage the cask lifting apparatus in the recessed lifting sockets. Use handcrank to lock the cask lifting apparatus balls in the cask sockets.
- | 7.1.1.8 Raise the shipping cask to the vertical position. This will require moving the trailer forward while the cask is being lifted.
- |
- | 7.1.1.9 Raise the cask to above the Cask Load and Unload Port (CLUP).
- | 7.1.1.10 Remove the trailer from the truck bay.
- 7.1.1.11 Lower the cask to seat on the CLUP.
- 7.1.1.12 Install the bottom restraint on the shipping cask.
- 7.1.1.13 Disengage the cask lifting apparatus from the cask.
- 7.1.1.14 Lower the CLUP hatch cover into place.

7.1.2 Dry loading

Note: The drain port is not used for loading operations.

7.1.2.1 Install the lid lifting attachments.

| 7.1.2.2 Remove the twelve (12) socket bolts that hold the lid in
| place.

7.1.2.3 Lift the lid from the cask and store.

| 7.1.2.4 Remove the lid o-ring port plug.

| 7.1.2.5 Examine the cask sealing surface.

| 7.1.2.6 Visually inspect the cavity of the cask for any damage or
debris. If any is noted, evaluate and take corrective
action if necessary.

| 7.1.2.7 Load the canister with six (6) spent fuel elements into
the cask. Record the contents on the cask loading
report.

| 7.1.2.8 Inspect the o-rings in the lid for damage and replace if
defects are noted. Record inspection results on the cask
loading report.

| 7.1.2.9 Transfer the lid to a position directly over the cask
cavity. Establish correct lid orientation using the
orientation marks and lower the lid until fully seated.
Visually verify the lid for proper installation.

- | 7.1.2.10 Inspect the lid bolts. Replace defective bolts and note any defect indications on the cask loading report. Apply a light coating of Nuclear Grade Neolube to bolt threads and install all 12 lid bolts. Tighten to hand tight. Torque all lid bolts to 130 ft-lbs. in several stages. Follow an approved torquing sequence.
- | 7.1.2.11 Install the Leak Test System (LTS) to the lid gasket port and evacuate the lid gasket interspace until a vacuum of equal to or greater than 60 cm Hg is achieved.
- | 7.1.2.12 Perform a pressure rise leakage test for assembly verification of the cask lid.
- |

The test must have a sensitivity of at least 1×10^{-3} std cm³/sec.

The acceptance criteria is a leakage rate of no greater than 1×10^{-3} std-cm³/sec. Replace the lid o-ring port plug.
- | 7.1.2.13 Remove the vent cover and evacuate the cask using the leak test system. Back fill with dry air.
- | 7.1.2.14 Inspect the vent cover, seal and bolts for damage and replace if defects are noted. Record inspection results on the cask loading report.
- | 7.1.2.15 Install the Vent port cover and bolts. Torque the bolts to 20 in-lbs.

- | 7.1.2.16 Remove the lid lifting attachments.

- | 7.1.2.17 Place the test bell over the Vent cover and use the LTS to reduce the pressure between the Vent port O-ring and the O-ring on the test bell until a vacuum of equal to or greater than 60 cm Hg is achieved. Isolate the vacuum pump and perform a pressure rise leakage rate test of the vent port cover. The acceptance criteria is a leakage rate no greater than 1×10^{-3} std-cm³/sec. The test must have a sensitivity of at least 1×10^{-3} std-cm³/sec.

- | 7.1.2.18 If the sum of the leakage rates from both tests is greater than the allowable rate, the leakage area shall be identified, repaired as needed and the test repeated until the acceptance criteria is satisfied.

- | 7.1.2.19 Remove the CLUP hatch cover.

- | 7.1.2.20 Engage the cask lifting apparatus in the recessed lifting sockets. Use the handcrank to lock the balls in the sockets.

- | 7.1.2.21 Remove the restraint from the bottom of the cask.

- | 7.1.2.22 Lift the cask from the fuel loading port, and lower it into the truck bay.

- | 7.1.2.23 Position the trailer such that the rear cask supports are under the cask.

- | 7.1.2.24 Align the trunnions of the cask with the support pedestals on the trailer.

- | 7.1.2.25 Place the trunnions on transport vehicle rear trunnion supports and rotate cask from the vertical to horizontal position. (This will require moving the trailer back into the transfer cask reception bay while lowering cask.)
- | 7.1.2.26 Install and torque the rear trunnion tie-downs.
- | 7.1.2.27 Remove the cask and trailer from the truck bay.
- | 7.1.2.28 Install and torque the front saddle tie-downs.
- | 7.1.2.29 Install the front and rear impact limiters and torque attachment bolts diametrically to 40 ft-lbs. Repeat torquing sequence to 80 ft-lbs.
- | 7.1.2.30 Install security seal on the front impact limiter.
- | 7.1.2.31 Perform final radiation and contamination surveys to assure compliance with 10CFR71.47 and 71.87.
- | 7.1.2.32 Apply appropriate labels to the cask and placards to the vehicle in accordance with 49CFR172.
- | 7.1.2.33 Install Personnel Barrier.
- | 7.1.2.34 Prepare final shipping documentation.
- | 7.1.2.35 Release the loaded cask for shipment.

7.2 PROCEDURES FOR UNLOADING PACKAGE

| 7.2.1 Receipt and Dry Unloading of Loaded Package

7.2.1.1 Upon arrival of the loaded cask at the receiving site, perform receipt inspection. Inspect for damage, verify security seals are intact and begin performance of radiation and contamination survey.

7.2.1.2 Verify that placards, labels and shipping papers are in place and correct.

| 7.2.1.3 Remove the personnel barrier.

| 7.2.1.4 Inspect and clean the tractor, trailer and cask as required.

7.2.1.5 Remove the security seal from the front impact limiter.

7.2.1.6 Remove the impact limiter attachment bolts and remove the front and rear impact limiters using a suitable crane and rigging.

| 7.2.1.7 Release and remove the front saddle and rear trunnion tie-downs.

7.2.1.8 Attach the cask lifting apparatus to the crane hook.

7.2.1.9 Engage the cask lifting apparatus in the recessed lifting sockets. Use handcrank to lock the balls into the sockets.

7.2.1.10 Lift the cask slowly to the vertical position.

- 7.2.1.11 Move the cask to the unloading area and lower in the vertical position using a suitable support. Disengage cask lifting apparatus.
- 7.2.1.12 Attach suitable lifting fixture to three (3) threaded holes in the lid.
- 7.2.1.13 Remove the vent cover.
- 7.2.1.14 Install the cavity gas sampling adapter in the vent test port.
- 7.2.1.15 Operate an evacuation system to draw a sample of the cavity gas from the cask.
- 7.2.1.16 Disconnect the evacuation system and install the vent cover.
- 7.2.1.17 Attach a lifting fixture to the lid using the three (3) threaded inserts.
- 7.2.1.18 Remove the twelve lid bolts.
- Caution: The next three steps must be performed remotely.
- 7.2.1.19 Remove the lid.
- 7.2.1.20 Use a suitable grapple to remove the canister containing six (6) spent fuel elements from the cask cavity.
- 7.2.1.21 Visually examine the cask sealing surfaces and interior for any damage or debris.

- 7.2.1.22 Visually examine the lid, especially the o-ring seals for any damage.
- 7.2.1.23 Transfer the lid to a position directly over the cask cavity. Establish correct lid orientation using the orientation marks and lower the lid until fully seated. Visually verify the lid for proper installation.
- | 7.2.1.24 Remove the lid o-ring port plug.
- | 7.2.1.25 Inspect the lid bolts. Replace defective bolts and note any defect indications on the cask loading report. Apply a light coating of Nuclear Grade Neolube to bolt threads and install all 12 lid bolts. Tighten to hand tight. Torque all lid bolts to 130 ft-lbs. in several stages. Follow an approved torquing sequence.
- | 7.2.1.26 Replace the lid o-ring port plug.
- | 7.2.1.27 Inspect the vent cover, seal and bolts for damage and replace if defects are noted. Record inspection results on the cask loading report.
- | 7.2.1.28 Install the Vent port cover and bolts. Torque the bolts to 20 in-lbs.
- | 7.2.1.29 Remove the lid lifting attachments.
- | 7.2.1.30 Engage the cask lifting apparatus in the recessed lifting sockets. Use the handcrank to lock the balls in the sockets.

7.3 PREPARATION OF EMPTY PACKAGE FOR TRANSPORT

- 7.3.1 Raise the cask into the vertical position and return to the trailer.
- 7.3.2 Position the cask above the trunnion supports and lower the cask.
- 7.3.3 Rotate cask from the vertical to the horizontal position.
- 7.3.4 Install and torque the rear trunnion tie-downs and the front saddle tie-downs.
- 7.3.5 Perform radiation and contamination survey.
- 7.3.6 Install the front impact limiter and torque attachment bolts diametrically to 40 ft-lbs. Repeat torquing sequence to 80 ft-lbs.
- 7.3.7 Apply appropriate transport labels to the cask and placards to the vehicle.
- 7.3.8 Install personnel barrier.
- | 7.3.9 Release empty cask for shipment.

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ENCLOSURE

REVISED DRAWINGS FOR TN-FSV SAFETY ANALYSIS REPORT
DRAWINGS 1090-SAR-1 THROUGH 1090-SAR-9 (REV.2)

FIGURE WITHHELD UNDER 10 CFR 2.390


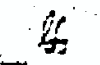
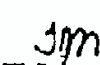
APPROVALS		DATE	 TRANSNUCLEAR, INC. <small>HAWTHORNE, N.Y.</small>			
		5/14/63	TN-FSV. PACKAGING ASSEMBLY			
		7/4/63				
J.T.G.		27 JAN 63	1/10	D	1090-SAR-1	2

FIGURE WITHHELD UNDER 10 CFR 2.390




APPROVALS	DATE	 TRANSNUCLEAR, INC. <small>BRIDGEVILLE, N.T.</small>			
	2/1/92	TN-PV. PACKAGING SHELL DETAILS & PARTS LIST			
	3/1/92				
J.T.G.	27 Jan 93	ISSUED	D	1090-SAR-3	2

FIGURE WITHHELD UNDER 10 CFR 2.390


NO.	DATE	ISSUANCE	DATE	QTR.	PER.
APPROVALS	DATE	 TRANSNUCLEAR, INC. BARTONVILLE, ILL.			
66	7/1/73	TN-RSY PROCESSING			
3/1/74	7/1/74	SHELL			
27	27	DETAILS			
JTG	1/1/74	AS SHOWN	D	1090-SAR-4	2
	1973	FOR			PL.

FIGURE WITHHELD UNDER 10 CFR 2.390

FIGURE WITHHELD UNDER 10 CFR 2.390

174941 700000000 0		2/10		2/10		2/10		2/10	
NO.	DATE	REVISIONS		PREP.	CHK.	NO.			
APPROVALS	DATE								
LS	3/1/93								
JTG	27 Jan 93								
TRANSNUCLEAR, INC.		1 TN-PSV PACKAGING PROJECT, LITERATURE ASSEMBLY							
4 NOV 93		D		1090-SAR-6		2			


FIGURE WITHHELD UNDER 10 CFR 2.390

IN.	DATE	INVOICE				PNL	CTD	PNOL
LYONVILLE	DATE							
65	3/1/73	<div>TRANSNUCLEAR, INC. MARTINBORO, I.T.</div> <div>TN-PSV PACKAGING FRONT IMPACT LIMITER DETAILS & PARTS LIST</div>						
37m	3/1/73							
27	3/1/73							
178	3/1/73	AS NOTED	D	1090-SAR-7	2			

FIGURE WITHHELD UNDER 10 CFR 2.390

1	1/4/93	ADDED NOTE 8		JIG.	P.S.	PS
NO	DATE	REVISIONS		APP.	CTR.	INCL.
APPROVALS		DATE		TRANSNUCLEAR, INC. BARTONVILLE, ILL.		
PS		3/1/93		TN-FSV PACKAGING REAR IMPACT LIMITER ASSEMBLY		
JIM		3/1/93				
JIG.		27 JAN 93		16 1/4 D 1090-SAR-B 2		
				PS		

FIGURE WITHHELD UNDER 10 CFR 2.390

NO		DATE		ISSUES		PAGE		CITY		STATE	
APPROVALS		DATE		 TRANSNUCLEAR, INC. BARTHOLOMEW, N.Y.							
JES		3/1/93		TN-FSV PACKAGING REAR IMPACT LIMITER DETAILS & PARTS LIST							
JPM		3/1/93									
JIG		27 JAN 93		AS NOTED		D		1090-SAR-9		2	