

# NUCLEAR PACKAGING, INC.

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TELEX: 152-556 "SEA"

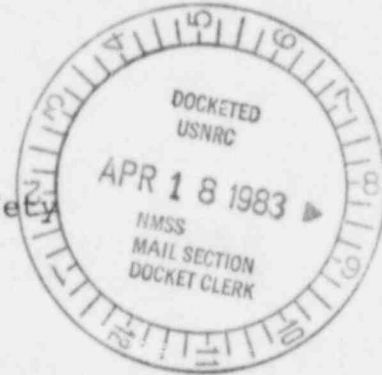
71-9079

PDR  
Return  
to  
39655

April 8, 1983

File: 30346.SRS

Mr. Richard H. Odegaarden  
Transportation Certification Branch  
Division of Fuel Cycle & Material Safety  
Nuclear Regulatory Commission  
Washington, DC 20555



APR 12 8:06

REFERENCE: Docket Number 9079

Dear Mr. Odegaarden:

Enclosed are replacement pages to the NuPac 14D-2.0 Safety Analysis Report (SAR) which you are now reviewing. The changes incorporated in these pages are a result of a recent conversation with Mr. C. Williams of your staff. He pointed out that the optional locating pins called out on Drawing X-20-215D would permit a cask to be used without provisions for lid alignment. We have deleted the word "optional" from Notes 10 and 11 on the drawing. He also requested that more information be included in Appendix 4.3.1 concerning the gamma scan procedures. This has been done also.

Please update your copies of the SAR by replacing Drawing X-20-215D with the Rev. B version enclosed and replace pages 4-9, -10, and -11 with the enclosed pages.

Please call us if you have any additional concerns or questions.

Sincerely yours,

NUCLEAR PACKAGING, INC.

S. R. Streutker

SRS/pro

Enclosures

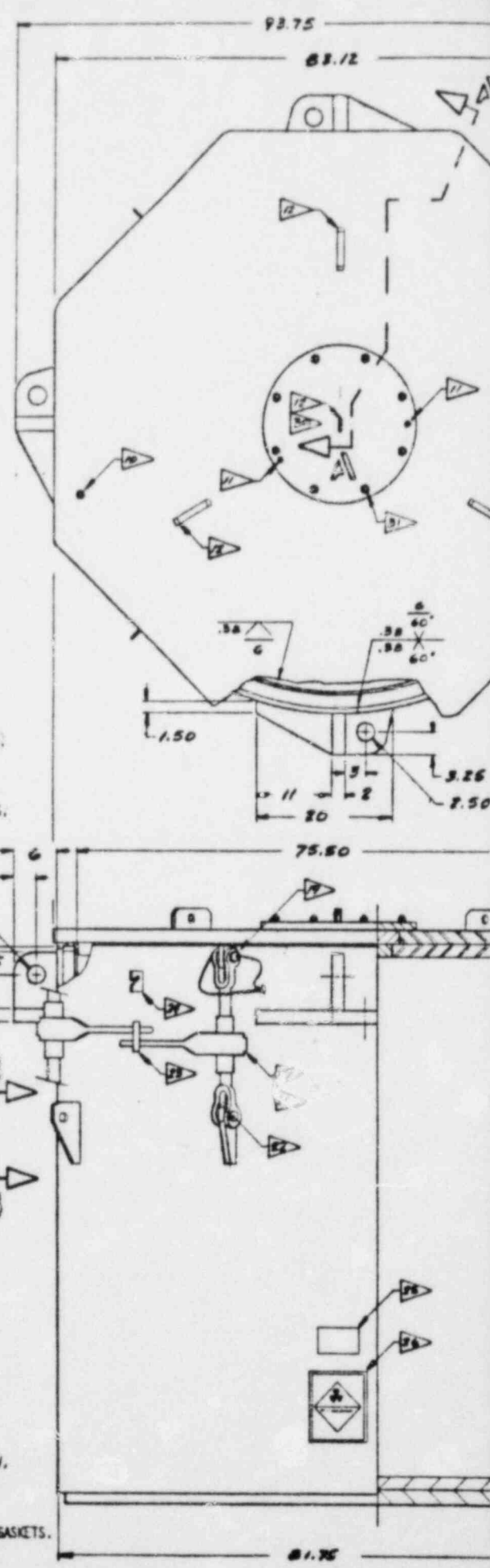
**FEE EXEMPT**

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adall ip

8304260074 830408  
PDR ADOCK 07109079  
C PDR

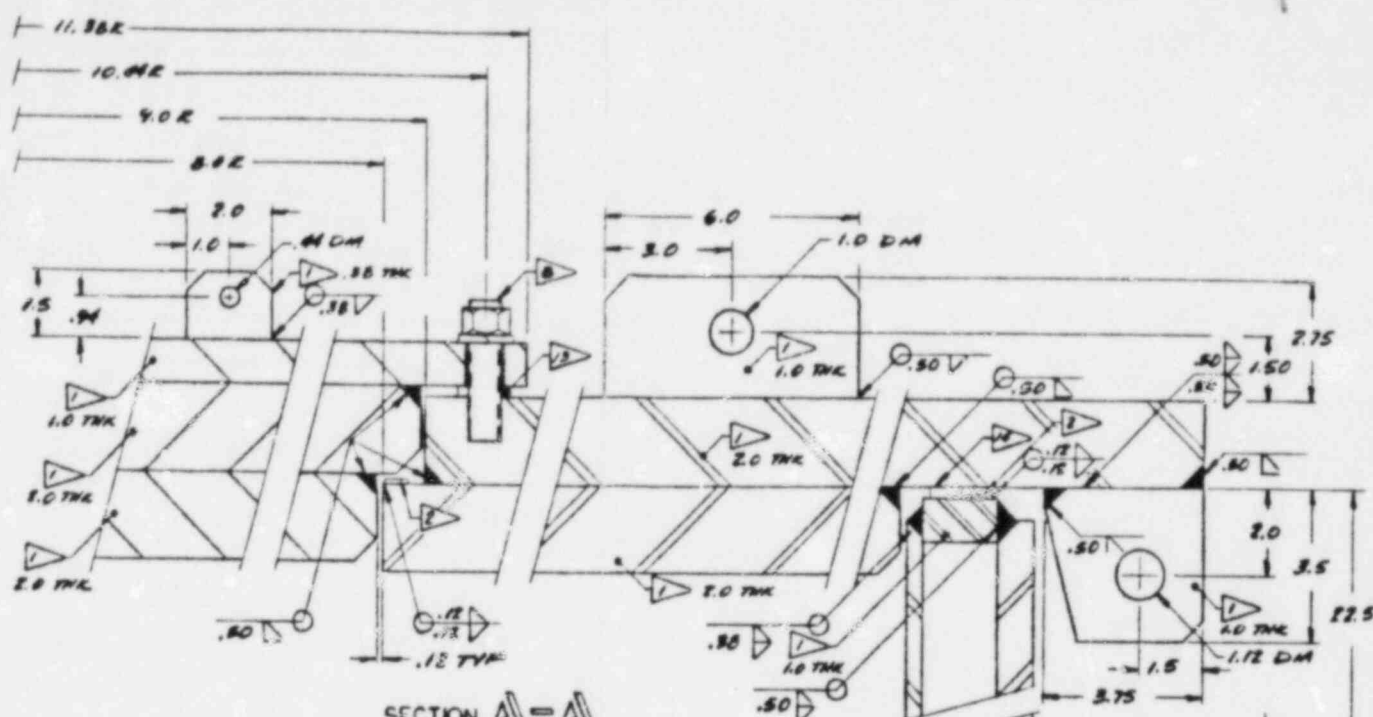
NOTES: UNLESS OTHERWISE SPECIFIED:

- 1 MATERIAL: ASTM A316, GRADE 70
- 2 MATERIAL: A151 1008 OR EQUIVALENT, .12 THICK, MINIMUM .50 WIDE.
- 3. TRANSPORTATION SHIELDS FABRICATED PRIOR TO DECEMBER 18, 1960 MAY BE CONSTRUCTED UTILIZING ASTM-A36 OR EQUIVALENT MATERIALS.
- 4. WELDING SHALL BE IN ACCORDANCE WITH ASME CODE SECTION IX OR AWS D1.1 AS APPLICABLE
- 5. WELD CALLOUTS SHOWN ARE TYPICAL FOR ALL LIKE ITEMS.
- 6 MATERIAL: LEAD PER 60-L-171a, GR. A OR C,
- 7. LEAD FILL SHALL BE IN ACCORDANCE WITH NUPAC APPROVED LEAD POURING PROCEDURES.
- 8 STUD: 3/4-10 UNC X 3-1/4 - 8 REQUIRED  
MATERIAL: ASTM A320, ANY L GRADE  
  
NUT, 3/4-10 UNC  
MATERIAL: ASTM A194, GR. 4 OR 7  
HELICAL SPRING LOCKWASHER, 3/4 HEAVY, CARBON STEEL, CAD PLATED,  
ALL OTHER FASTENERS SHALL BE SAE GR. 5
- 9 .105 THICK (12 GA) 304 SST INTERIOR LINER IS OPTIONAL. IF INSTALLED SAID LINER SHALL BE SEAL WELDED ALONG ALL EDGES.
- 10 ONE INCH DIAMETER ORIENTATION PIN
- 11 3/4 INCH DIAMETER ORIENTATION PIN
- 12 LIFTING LUG COVERS SHALL BE PROVIDED AS REQUIRED;
- 13 NEOPRENE GASKET, 1/4 INCH MINIMUM THICKNESS X 1-1/4 INCH MINIMUM WIDTH;
- 14 NEOPRENE GASKET, 1/4 INCH MINIMUM THICKNESS X 3/8 INCH MINIMUM WIDTH.
- 15 3/4 INCH PIPE, (UTILIZES 1/2 NPT PIPE PLUG)
- 16 DETAIL C OPTIONAL DRAIN UTILIZES A 1/2 NPT PIPE PLUG WITH A 1-1/4 NPT COVER PLUG.
- 17 OVER DRAIN OPENING ONLY.
- 18 CENTER SQUARE BAR OVER DRAIN OPENING, FILLET INNER EDGE (AS SHOWN) AND BOTH ENDS.
- 19 ONE INCH DIAMETER FASTENER WITH LANYARD ASSEMBLY AND LOCKING PIN. FASTENER PER ASTM - A320 ANY L GRADE
- 20 RATCHET BINDER TYPE J, 1-3/8 X 8, W.W. PATTERSON, 8 REQUIRED
- 21 ORIENT RATCHET BINDERS SUCH THAT THE UNIT TIGHTENS AS HANDLE IS PULLED AWAY FROM SHIELD BODY.
- 22 ONE INCH DIAMETER FASTENER, PER ASTM -A320 ANY L GRADE
- 23 RATCHET BINDER RETAINER
- 24 OPTIONAL COVER TIE DOWN BRACKETS.
- 25 IDENTIFICATION PLATE
- 26 OPTIONAL IDENTIFICATION PLATE
- 27 LOCKWIRE PRIMARY AND SECONDARY LIDS AS REQUIRED FOR SHIPMENT.
- 28 PAINT TRANSPORTATION SHIELD PER NUPAC APPROVED PROCEDURES.
- 29 SCALE, TOP & FRONT VIEW - 1/10  
DETAILS & SECTIONS - 1/2
- 30 USE 3 LUGS EQUALLY SPACED AS AN OPTION.
- 31 TORQUE REQUIREMENTS: a) 3/4-10 UNC NUTS - 100 FT/LBS  
b) RATCHET BINDERS - 50 FT/LBS MINIMUM
- 32 ALL WELDS SHALL BE VISUALLY EXAMINED IN ACCORDANCE WITH ASME CODE SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 9.
- 33 CONTINUOUS WELDS ON LIFTING AND HOLD DOWN LUGS SHALL BE MAGNETIC PARTICLE OR LIQUID PENETRANT INSPECTED, AFTER 125% LOAD TEST, IN ACCORDANCE WITH ASME CODE SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000 AND SECTION V, ARTICLE 7 OR 8. ALL OTHER WELDS SHALL ALSO BE INSPECTED TO THESE REQUIREMENTS, EXCEPT LOAD TEST SHALL NOT BE PERFORMED.
- 34 MATERIAL FINISH SHALL BE  $\sqrt{125}$  MINIMUM ON ALL SURFACES INTERFACING WITH NEOPRENE GASKETS.

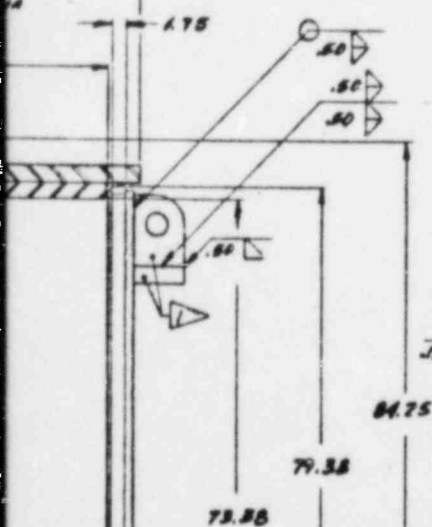


4 3 2 1

| ZONE | LET     | REVISIONS | DATE    | APPROVED |
|------|---------|-----------|---------|----------|
| A    | SEE DCN |           | 7-13-52 |          |
| B    | SEE DCN |           | 8-22-52 |          |

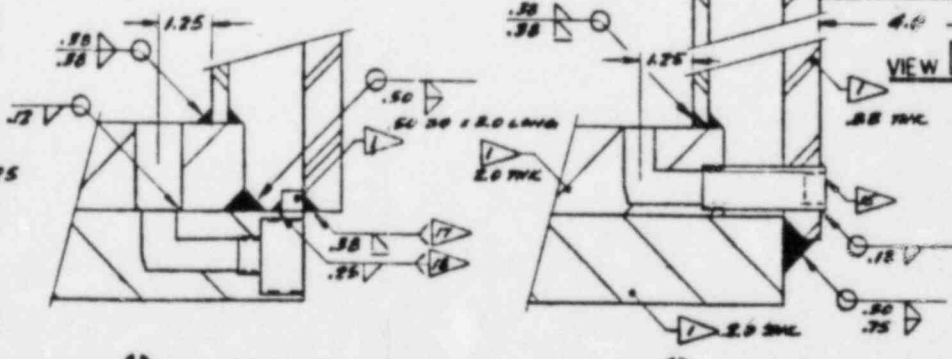


**SECTION A-A**  
 ROTATED 90° CW  
 BASKETS SHOWN UNCOMPRESSED  
 NUTCHET BINDER AND FASTENERS OMITTED



79.38  
79.88

**DETAIL C (OPTION)**  
 DRAIN, LOCATION OPTIONAL



**VIEW B-B**

**DETAIL B (OPTION)**

23  
 3 X-20-215D  
 A

| ITEM   | PART NO | DESCRIPTION      | MATERIAL     |
|--|---------|------------------|--------------|
| ASSEMBLY & QUANTITY                                  |         | LIST OF MATERIAL |              |
| UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES  |         |                  |              |
| TOLERANCES   |         |                  |              |
| FRACTIONS: ANGLES                                    |         |                  |              |
| 2 PLACE DECIMALS                                     |         |                  |              |
| 3 PLACE DECIMALS                                     |         |                  |              |
| 4 PLACE DECIMALS                                     |         |                  |              |
| DO NOT SCALE THIS DRAWING                            |         |                  |              |
| <b>NUCLEAR PACKAGING, INC.</b><br>TACOMA, WASHINGTON |         |                  |              |
| TRANSPORTATION SHIELD<br>NUPAC 340-2-0               |         |                  |              |
| DRAWN  | DATE    | SCALE            | WT           |
| CHKD   |         | REV              | SHEET / OF / |
| CHECK  |         | DWG NO           | DWG NO       |
| NEXT ASBY  | USED ON | DATE             | DATE         |
| APPLICATION  |         | D                | X-20-215D    |

4 3 2 1

Revision

March 1, 1983

#### APPENDIX 4.3.1 DISCUSSION OF GAMMA SCAN PROCEDURE

Lead shielding integrity shall be confirmed via gamma scanning. There are two gamma scan techniques utilized. The main difference is in the method utilized to determine acceptance criteria.

Both Gamma Scan Techniques are exactly the same in all other respects and are conducted as follows.

An Eberline E120 probe or equivalent is used to scan the outer surface of the cask while an Iridium 192 or Cobalt 60 source of sufficient strength is present in the center of the cask. The source is first placed on the bottom of the cask while the surface is scanned around its circumference parallel to the source. The source is then moved up a pre-determined distance and the circumference scanned again. This sequence is repeated until the entire cask surface is scanned.

For these tests, a 4 inch grid is drawn on the cask surface and a chart is made to reflect the gridded cask surface. The readings obtained in the cask grid as described above are recorded in the corresponding grid on the chart. This data then serves as the raw gamma scan results. All readings are in Milliroentgens (MR).

The readings are evaluated by comparing them to predetermined MR values for nominal, or as designed, lead thickness and nominal - 10% lead thickness.

The two different methods utilized to determine acceptance criteria are discussed below.

Revision

March 1, 1983

The Laboratory Calibration Method (NuPac Procedure GS-001) utilizes two test blocks which simulate the cask wall. The blocks are made up of lead and steel. The first has a lead thickness equal to the cask as-designed lead thickness. The second has 10% less lead thickness. The source is placed a distance away from one surface of the test block which equals the inside radius of the cask. The probe is placed on the opposite side of the test block and readings are taken. This procedure is then repeated for the -10% test block.

Acceptance criteria is determined by averaging the dose readings of the as-designed and -10% test blocks. This is then multiplied by the increase in dose expected due to -10% shield (the ratio of the -10% reading to the as-designed readings). This is the maximum reading allowed on the surface of the cask being inspected. The average of the nominal and -10% readings is used to account for differences in geometry between the calibration test and the cask acceptance test.

The Field Calibration Method (NuPac Procedure GS-002) utilizes a specially fabricated test lid which incorporates a holder for various lead and steel sheet thicknesses. This fixture is installed onto the cask to be scanned. The test lid is then set up to simulate the nominal lead thickness, the source is placed below the test lid in the cask at a distance equal to the inside radius of the cask. Readings are then taken. The test lid is then set up to recreate the -10% lead thickness configuration, and readings are again taken. Other readings are then taken in 1/8 inch lead thickness increments between and beyond the two base readings until four to eight readings are obtained. The

Revision

March 1, 1983

data is then plotted on a chart of readings versus lead thickness. The value for nominal lead -10% is then utilized as the maximum acceptable reading during the actual gamma scan.

DOCKET NO. 71-9079  
CONTROL NO. 22144  
DATE OF DOC. 04/05/83  
DATE RCVD. 04/12/83  
FCUF \_\_\_\_\_ PDR   
FCAF \_\_\_\_\_ LPDR \_\_\_\_\_  
WM \_\_\_\_\_ I.E. REF.   
WMUR \_\_\_\_\_ SAFEGUARDS \_\_\_\_\_  
FCTC  OTHER \_\_\_\_\_

DESCRIPTION:

Enclosed are replacement  
pages to the NuPac  
14D-2.0. Safety Analysis  
Report (SAR) which you  
are now reviewing  
04/19/83 INITIAL CCE