NUCLEAR PACKAGING, INC.

815 SO. 28TH STREET • TACOMA, WASHINGTON 98409 • (206) 572-7775 • 838-1243
TELEX: 152-556 "SEA"

71-9159
PDR
Return to 396SS

March 24, 1983

File: 30296.SRS

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

REFERENCE: Docket Number 71-9159
NuPac Series A Packaging

Dear Mr. Odegaarden:

Enclosed are revised pages to the Type A Family SAR which have been changed in response to concerns which you discussed with us in recent telephone conversations. Please replace the following SAR pages with the enclosed revised pages.

Page 2-69 (Drawing X-20-204D, Rev. D Sheet 1 of 2)
Page 2-70 (Drawing X-20-204D, Rev. D Sheet 2 of 2)
Page 2-75 (Drawing SK-206)
Page 8-6
Page 8-7

We trust that these changes will resolve the concerns expressed. The changes are:

1. [illegible] eld callout for the cask inner wall has been changed to a[illegible] modate all cask sizes.
2. The Gamma Scan procedure has been modified to include the grid size and additional information on the laboratory calibration procedure.
3. The Ratchet Binder drawing has been given a number (SK-206).

A check for $1200.00 is enclosed to cover the required approval fee for this submittal.

check applied only app. for approval

FEE EXEMPT

'83 MAR 28 A8:45

22092

NUCLEAR PACKAGING, INC.

We would like to thank you for allowing us to respond to your concerns in this fashion. This has significantly reduced the normal processing time and allows us to respond more quickly to our customers' needs.

Sincerely yours,

NUCLEAR PACKAGING, INC.

S. R. Streutker

SRS/pro

Enclosures: (8) sets of copies per above
Check No. 9030

NOTES: UNLESS OTHERWISE SPECIFIED.

1. **MATERIAL:** NUT, ASTM-A194 GR. 4 OR 7
   STUD, ASTM-A320 GR. L-7
   PLATE, ASTM-A516 GR. 70 (EXCEPT WHERE NOTED)
   PLATE, ASTM-A514 OR A517
   PLATE, AISI 1018 OR ASTM A-36
   ALL ASTM A516 GR 70 MATERIAL SHALL BE NORMALIZED.
2. WELDING SHALL BE IN ACCORDANCE WITH ASME CODE SECTION IX, OR AWS D1.1 AS APPLICABLE.
3. PAINT PER APPROVED NUPAC PROCEDURES.
4. LEAD FILL SHALL BE IN ACCORDANCE WITH NUPAC APPROVED LEAD POURING PROCEDURES.
5. TWELVE GAUGE 304-SS CASK LINER SHALL BE INSTALLED IN THE CAVITY AND SEAL WELDED ALONG ALL EDGES.
6. INSTALL NUPAC BINDER WITH HANDLE ORIENTATED TO TIGHTEN BINDER AS HANDLE IS PULLED AWAY FROM SHIELD BODY.
7. LOCKWIRE PRIMARY & SECONDARY LIDS AS REQUIRED FOR SHIPMENT.
8. TORQUE 3/4-10UNC NUTS TO 100 FT/LBS.
9. 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.
10. 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 6. ALL OTHER WELDS SHALL ALSO BE INSPECTED TO THESE REQUIREMENTS, EXCEPT LOAD TEST SHALL NOT BE PERFORMED. AS AN OPTION, LONGITUDINAL SHELL SEAM WELDS MAY BE RADIOGRAPHIC INSPECTED PER ASME CODE, SECTION III, DIVISION 1, SUBSECTION NB, ARTICLE NB-5000, AND SECTION V, ARTICLE 2 IN LIEU OF LP OR MP INSPECTION.
11. TORQUE BINDERS TO 50 FT/LBS. MIN.
12. OPTIONAL .25 DIA VENT HOLE WITH 3/4 NPT PLUG.
13. NUPAC BINDER UPPER PINS ARE 1" DIA. WITH A MINIMUM DOUBLE SHEAR YIELD STRENGTH OF 117,000 LBS. LOWER BOLTS ARE 1" DIA. SAE GR. 8.
14. AN ALIGNMENT STRIPE SHALL APPEAR ON THE LID AS DIMENSIONED & ON THE CASK BODY TO THE BOTTOM EDGE OF THE LOWER RATCHET BINDER LUG, ALONG WITH THE FACES OF THE TWO LID ALIGNMENT GUIDES. A GOOD GRADE ENAMEL SHALL BE USED. COLOR: BRIGHT ORANGE
15. MATERIAL FINISH SHALL BE $125\sqrt{}$ MINIMUM ON ALL SURFACES INTERFACING WITH NEOPRENE GASKETS.

MODEL	BASIC DATA						
	DRUM CAPACITY	PAYLOAD VOLUME (CU.FT.)	LEAD EQUIV. (IN.)	EMPTY WEIGHT (LBS.)	PAYLOAD WEIGHT (LBS.)	LOADED * WEIGHT (LBS.)	A
NUPAC 14/210L	14	217	2.00	31,600	20,000	51,600	77.2
NUPAC 14/210H	14	217	2.73	38,400	20,000	58,400	77.2
NUPAC 14/190L	14	190	2.00	29,200	20,000	49,200	75.1
NUPAC 14/190M	14	190	2.25	33,500	20,000	53,500	75.1
NUPAC 14/190H	14	190	3.50	45,200	20,000	65,200	75.1
NUPAC 10/140	10	144	3.60	41,500	15,000	56,500	66.4
NUPAC 7/100	7	104	3.50	35,900	13,000	48,900	75.1
NUPAC 6/100L	6	105	3.25	30,900	12,000	42,900	61.4
NUPAC 6/100H	6	105	4.40	41,900	12,000	53,900	61.4

* WITH MAXIMUM THEORETICAL PAYLOAD WEIGHT.

** REF DIMENSION ONLY.

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE DCN	10-85	
	B	SEE DCN	2-4-85	
	C	SEE DCN	2-11-88	
	D	SEE DCN	3-23-88	

TYPE "A" FAMILY TABLE

DIMENSIONS															
B**	C	D	E	F	G	H	J**	K	L	M	N	P	Q**	R	S
80.25	2.0	2.0	2.0	2.0	1.25	15.5	82.25	92.00	.38	.88	86.06	83.78	92.25	70.56	.88 OR 1.0
80.25	2.0	2.0	2.0	2.0	1.88	15.5	83.5	92.00	.38	.88	86.06	84.93	93.5	70.56	.88 OR 1.0
73.38	2.0	2.0	2.0	2.0	1.25	15.5	80.5	85.13	.38	.88	79.19	82.16	90.5	63.69	.88 OR 1.0
73.38	2.0	2.0	2.0	2.0	1.75	15.5	81.5	85.13	.38	.88	79.19	83.09	91.5	63.69	.88 OR 1.0
73.38	3.0	2.0	3.0	2.0	2.63	15.5	83.25	87.13	.38	.88	81.19	84.70	93.25	65.69	.88 OR 1.0
73.0	2.0	3.0	3.0	2.0	2.75	51.63	74.77	86.75	.50	1.13	80.81	76.87	84.77	45.5	1.13
40.75	2.0	3.5	3.5	2.0	3.0	15.5	84.0	55.50	.38	.88	49.56	85.40	94.0	34.06	.88 OR 1.0
62.0	2.0	2.5	2.5	2.0	2.43	39.63	69.11	74.75	.50	1.13	68.81	71.64	79.11	33.5	1.13
62.0	3.0	3.0	3.0	3.0	3.56	42.63	71.37	77.75	.50	1.13	70.81	73.73	81.37	36.5	1.13

ASSEMBLY & QUANTITY

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
FRACTIONS ±
ANGLES ± 0°-30'
3 PLACE DECIMALS ± .010
2 PLACE DECIMALS ± .03
1 PLACE DECIMALS ± .1

DO NOT SCALE THIS DRAWING

NEXT ASSY	USED ON
	340-1

APPLICATION

ITEM	PART NO	DESCRIPTION	MATERIAL

LIST OF MATERIAL

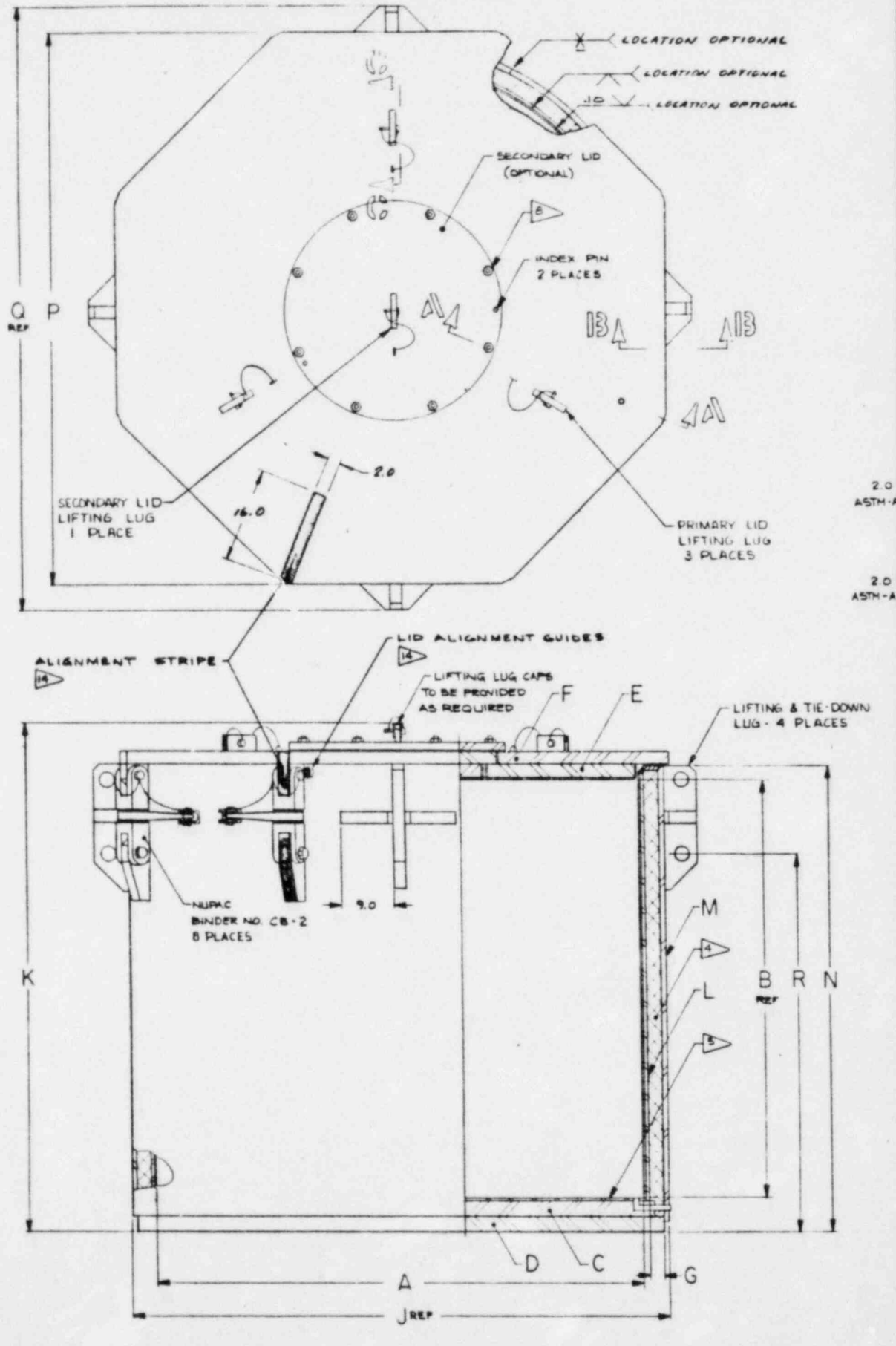
NUCLEAR PACKAGING, INC.
TACOMA, WASHINGTON

NUPAC SERIES A CASKS

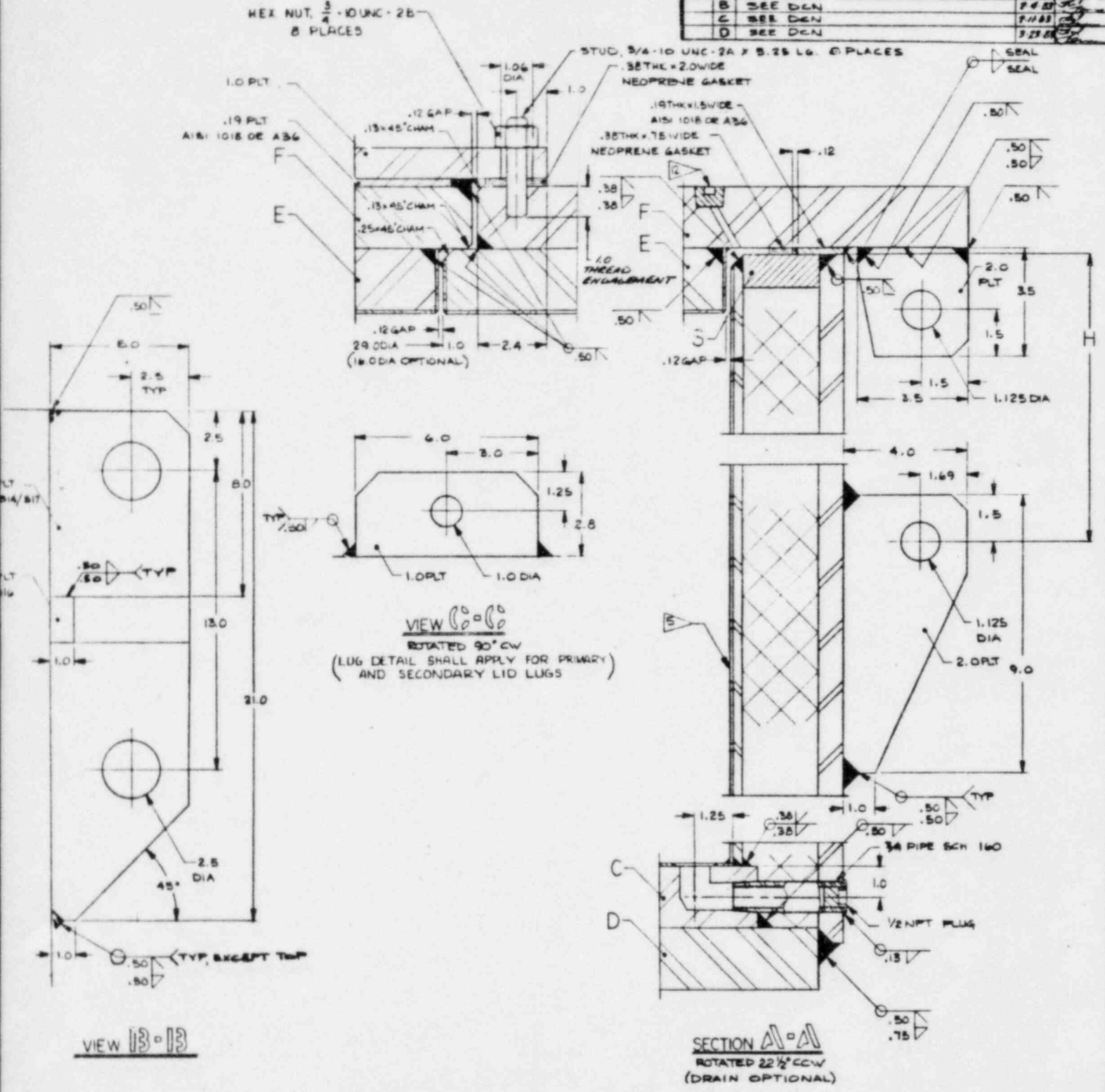
DRAWN	S. C.	6-82	QA	4/24/87
CHECK			DWG REL (D)	3-23-88
ENGR			PROG REL	10/19/87

SCALE: WT
REV D SHEET 1 OF 2
DWG SIZE D DWG NO. X-20-204D

D X-20-204D 1 of 2


LOCATION OPTIONAL
LOCATION OPTIONAL
LOCATION OPTIONAL
SECONDARY LID (OPTIONAL)
INDEX PIN 2 PLACES
Q REF
P
2.0
16.0
SECONDARY LID LIFTING LUG 1 PLACE
PRIMARY LID LIFTING LUG 3 PLACES
ALIGNMENT STRIPE
LID ALIGNMENT GUIDES
LIFTING LUG CAPS TO BE PROVIDED AS REQUIRED
F
E
LIFTING & TIE-DOWN LUG - 4 PLACES
NUPAC BINDER NO. CB-2 8 PLACES
9.0
K
M
L
B REF
R
N
D
C
G
A
J REF

REVISIONS				
ZONE	LTR	DESCRIPTION	DATE	APPROVED
	A	SEE DCN	10-9-82	
	B	SEE DCN	9-6-83	
	C	SEE DCN	9-11-83	
	D	SEE DCN	9-23-83	



VIEW B-B

VIEW C-C
ROTATED 90° CW
(LUG DETAIL SHALL APPLY FOR PRIMARY AND SECONDARY LID LUGS)

SECTION A-A
ROTATED 22½° CCW
(DRAIN OPTIONAL)

ITEM	PART NO	DESCRIPTION	MATERIAL

LIST OF MATERIAL

ASSEMBLY & QUANTITY

UNLESS OTHERWISE SPECIFIED DIMENSIONS ARE IN INCHES.
TOLERANCES:
FRACTIONS ±
ANGLES °
3 PLACE DECIMALS ±
2 PLACE DECIMALS ±
1 PLACE DECIMALS ±

DO NOT SCALE THIS DRAWING

NEXT ASSY | USED ON

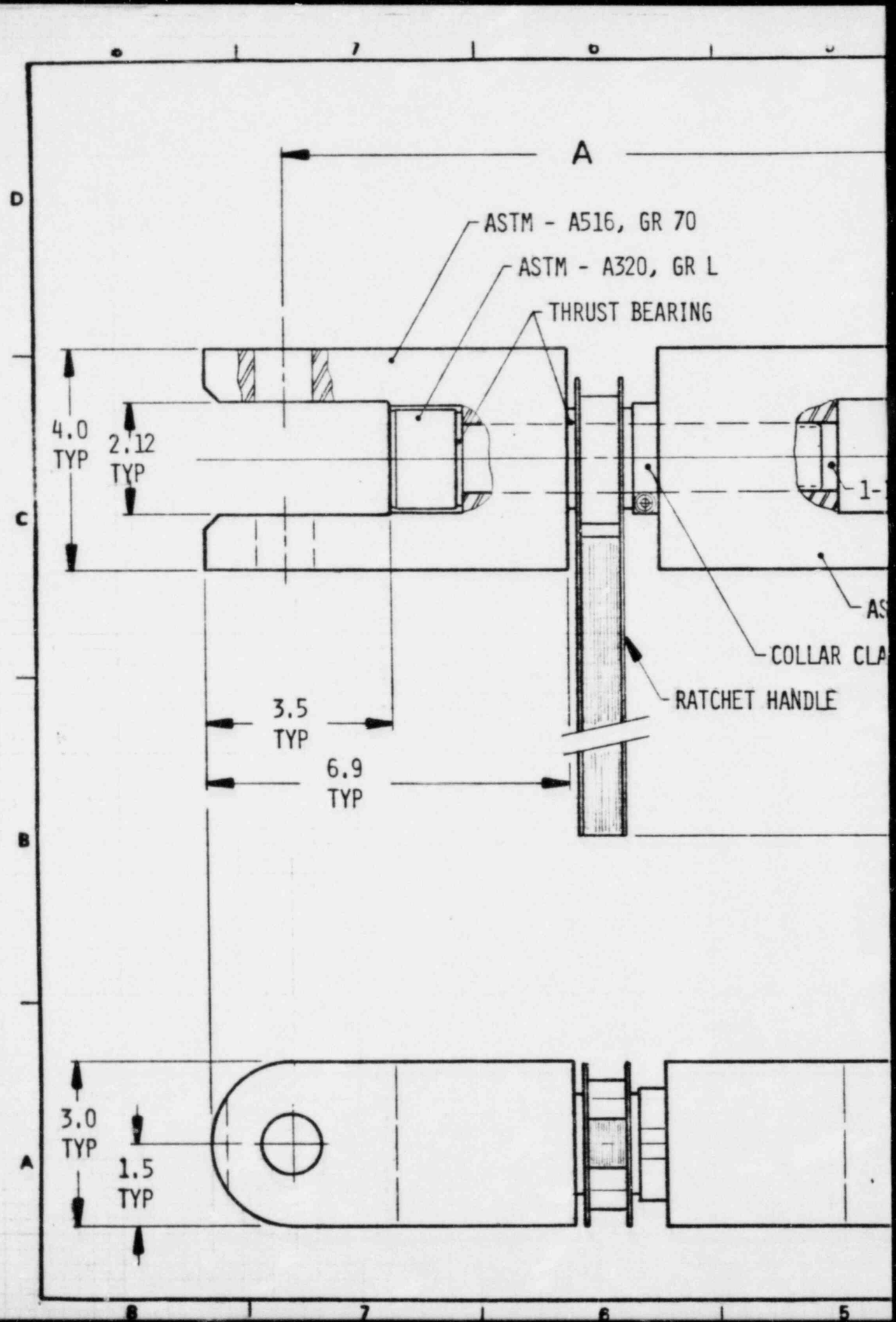
APPLICATION

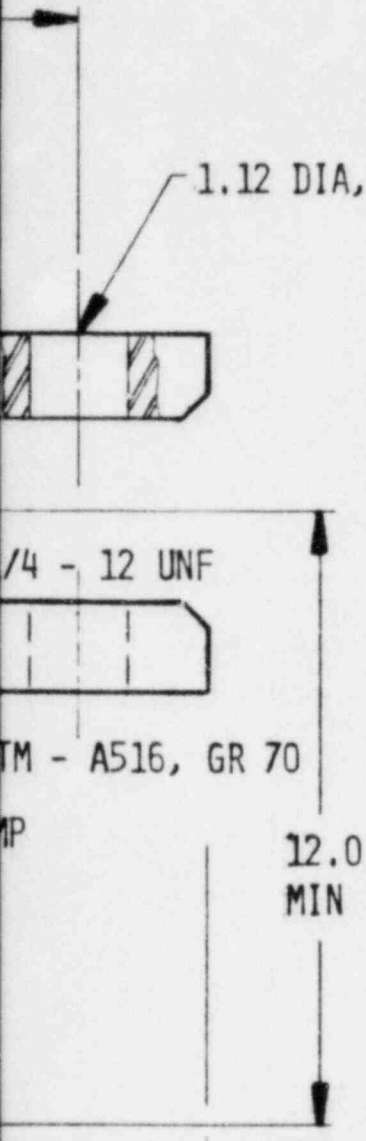
NUCLEAR PACKAGING, INC.
TACOMA, WASHINGTON

NUPAC SERIES A CASKS

DRAWN PCP	10/12/82	Q.A.	10/14/82	SCALE: NONE	WT.
CHECK PMC PEARSON	10/19/82	DWG. RELEASE	9-23-83	REV D	SHEET 2 OF 2
ENGR	10/20/82	PROD. RELEASE	10/18/82	DWG SIZE D	DWG NO X-20-204D

X-20-204D 2 of 2


A
ASTM - A516, GR 70
ASTM - A320, GR L
THRUST BEARING
4.0
TYP
2.12
TYP
COLLAR CLA
RATCHET HANDLE
3.5
TYP
6.9
TYP
3.0
TYP
1.5
TYP



MODEL NUMBER	RATED CAPACITY (YIELD IN POUNDS)	RATCHET SCREW DIAMETER	"A" MAXIMUM EXTENSION	USABLE ADJUSTMENT
CB - 2A	100,000	1-1/4	14.0	1.25
CB - 2B	100,000	1-1/4	38.0	1.25
CB - 2C	100,000	1-1/4	41.0	1.25
CB - 2D	100,000	1-1/4	50.0	1.25

ITEM | PART NO | DESCRIPTION | MATERIAL

LIST OF MATERIAL

UNLESS OTHERWISE SPECIFIED
DIMENSIONS ARE IN INCHES
TOLERANCES
FRACTIONS ±
ANGLES ±
2 PLACE DECIMALS ±
3 PLACE DECIMALS ±
1 PLACE DECIMALS ±

DO NOT SCALE THIS DRAWING

NEXT ASSY | USED ON

APPLICATION

NUCLEAR PACKAGING, INC.
TACOMA, WASHINGTON

NUPAC SERIES CB-2 RATCHET BINDER

DRAWN PHIL PEARSON
CHECK
ENG APPR
MFG APPR

SCALE | WT
REV | SHEET OF

SIZE B | DWG NO. SK-206

2-75

APPENDIX 8.3 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.

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 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. 71-9159
CONTROL NO. 22092
DATE OF DOC. 03/24/83
DATE RCVD. 03/28/83
FCUF _____ PDR ✓
FCAF _____ LPDR _____
WM _____ I&E REF. ✓
WMUR _____ SAFEGUARDS _____
FCTC ✓ OTHER _____

DESCRIPTION:
Enclosed are revised pages to the Type A Family SAR

04/05/83 INITIAL CEC