



71-9044

GE Nuclear Energy

General Electric Company  
Vallecitos Nuclear Center  
P.O. Box 460, Vallecitos Road  
Pleasanton, CA 94558

February 5, 1991

Mr. C. E. MacDonald, Chief  
Transportation Branch  
Office of Nuclear Material Safety & Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

Reference: Certificate of Compliance No. 9044, Docket 71-9044

Dear Mr. MacDonald:

Certificate of Compliance No. 9044 permits the shipment of nonfissile irradiated metal hardware with a maximum heat load of 600 watts. This hardware is shipped to the Vallecitos Nuclear Center (VNC) usually for examination in the shielded cell facility.

Occasionally, it will be necessary to ship irradiated hardware which, while within the 600-watt heat load limit, will require additional shielding to meet the DOT external dose rate requirements. To provide this shielding, VNC proposes the use of an inner steel liner for the Model 1600 shipping container. The liner will be fabricated as follows:

Material: 10-inch-diameter carbon steel rod approximately 53 inches in length.

Cavity: 1-1/4-inch cavity drilled down the center axis of the rod. The cavity will run the length of the rod.

Weight: Maximum 1,200 lb. (within the weight limits of Certificate of Compliance No. 9044).

The liner is shown on Certification Drawing No. 166D8032, Rev. 0, attached.

As the height of the cask cavity is 54 inches, the length of the liner (approximately 53 inches) precludes any hardware from escaping into the cavity during normal conditions of shipment. Shoring will be provided as required by Certificate of Compliance No. 9044. The form of the shoring is not specified as the location of the liner in the cask cavity is immaterial (see dose rate analysis below).

1/5

9102140073 910205  
FDR ADOCK 07109044  
C FDR

158022

NT01

The liner will be provided with a lifting device to permit its insertion and removal from the cask. This device has not been classified as safety related as: (1) it will be used only for insertion/removal of the liner prior to and after shipment and serves no function during transport, and (2) it cannot be used to lift other components of the packaging.

Shielding calculations were made using a Radiation Shielding Information Center (RSIC) provided computer code, ISOSHL. The quantities of Co-60 necessary to meet the maximum permitted radiation levels during transport of the Model 1600 were calculated using the following assumptions:

Isotope: Co-60 was chosen as it is the limiting isotope for the activation products in most irradiated hardware

Liner location: Directly against the cask cavity wall. This is the worst configuration as it allows no credit for spacing within the cavity.

Accident Condition: No credit was taken for any shielding by the liner in the accident condition.

Using ISOSHL, the following results were obtained:

<u>Mode</u>	<u>Maximum Dose Rate</u>	<u>Ci Co-60 to Produce Maximum Dose Rate</u>
Exclusive Use*	Surface of Package - 200 mRem/hr	51,000
	2 m from Vehicle - 10 mRem/hr	23,000
Exclusive Use * Closed Vehicle	Surface of Package - 1,000 mRem/hr	257,000
	Surface of Vehicle - 200 mRem/hr	107,000
	2 m from Vehicle - 10 mRem/hr	23,000
Accident Condition	1 m from Package Surface - 1,000 mRem/hr	33,000

The above calculations demonstrate that as long as the contents of the liner do not exceed 23,000 Ci of Co-60 or equivalent, all maximum permitted dose rates will be met. (Note: Because of the small diameter of the liner cavity, the lack of the 10 inches of steel at the top and bottom of the liner poses no problem. Dose rates at the package surface will be approximately

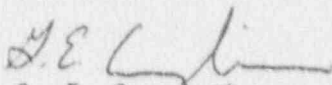
The Model 1600 is only shipped exclusive use.

25% of those at the side. All shipments will be measured for radiation levels prior to shipment.) Therefore, General Electric requests that Certificate of Compliance No. 9044 be modified to permit the use of the inner liner shown on Certification Drawing No. 166D8032, Rev. 0 when necessary, to provide additional shielding for shipments of nonfissile irradiated metal hardware with a content not exceeding 20,000 Ci of Co-60 or its equivalent.

Section 5.(a)(3) of Certificate of Compliance No. 9044 lists an exception to Drawing No. 129D4735, Rev. 4 concerning the length of fastening bolts. GE is including in this submittal a revised drawing No. 129D4735, Rev. 5, which corrects the drawing to conform with the Certificate. It also includes a reference for the new steel liner.

If you have any questions concerning this request, please contact me on (415) 862-4330. Thank you.

Sincerely



G. E. Cunningham  
Senior Licensing Engineer

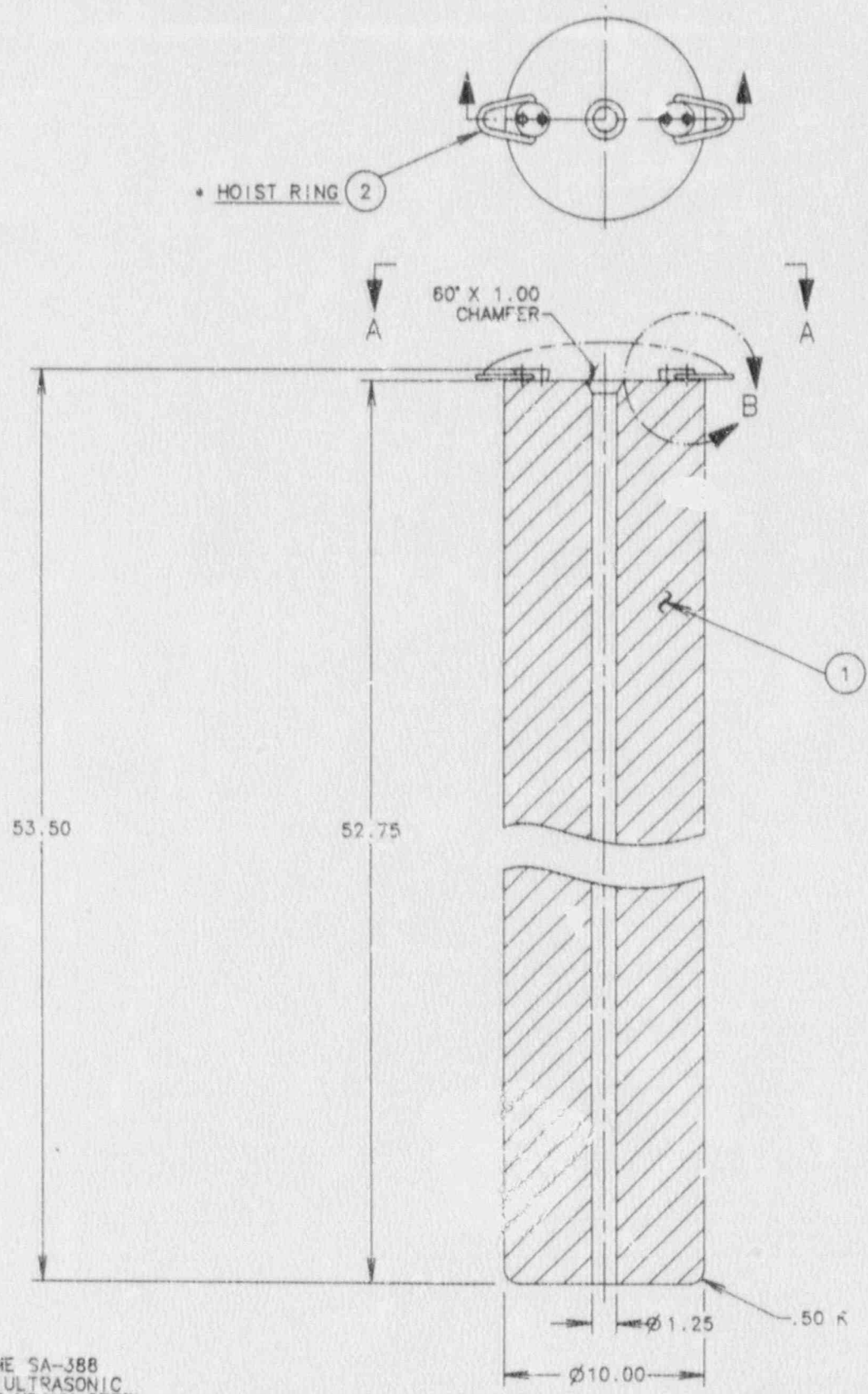
/ca

Attachments

Attachments

Certification Drawing No. 129D4735, Rev. 5  
Certification Drawing No. 166D8032, Rev. 0

G  
F  
E  
D  
C  
B  
A



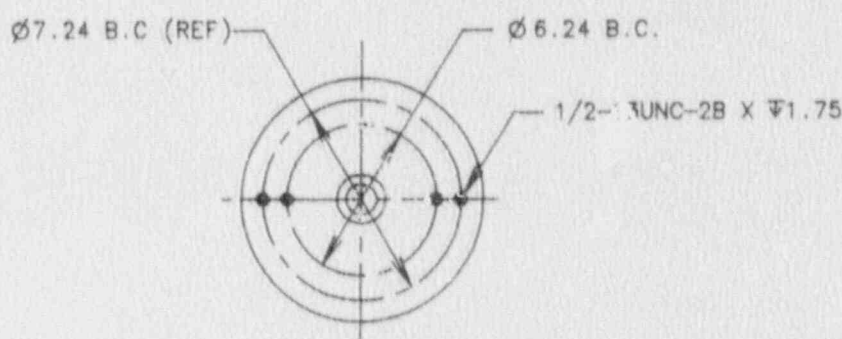
NOTES:

1. LINER TO BE TESTED PER ASME SA-388 "RECOMMENDED PRACTICE FOR ULTRASONIC TESTING AND INSPECTION OF HEAVY STEEL FORGINGS".
2. DRILL AND TAP OR WELDING MAY BE USED TO ATTACH SHORING DEVICE.
3. LINER WEIGHT: 1200 ± 50 LBS.
4. (\*) DENOTES A NON-SAFETY RELATED COMPONENT.

G1

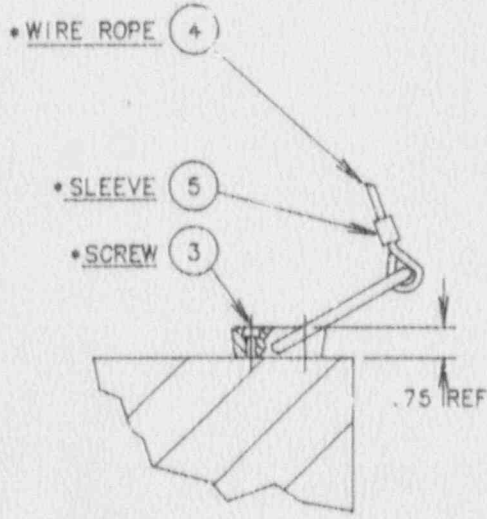
GROUP NO AND QTY	ITEM NO	NAME	IDENTIFICATION
G01			
1	1	LINER	SEE DETAIL
2	2	HOIST RING	REID #SHR-34030 OR EQUIVALENT.
4	3	S.H.C.S.	REID #SHRS-3 (1/2-13UNC-2A SST.)
A/R	4	WIRE ROPE	SPC # 1/4-7x19 SST. 12"
2	5	SLEEVE	McCARR #3573T6 OR EQUIVALENT

REV: 2108



VIEW A-A  
HOIST RINGS AND WIRE ROPE  
NOT SHOWN FOR CLARITY

FINISHED  
CARBON STEEL  
ASTM A108



DETAIL B

SI  
APERTURE  
CARD

9102140073-01

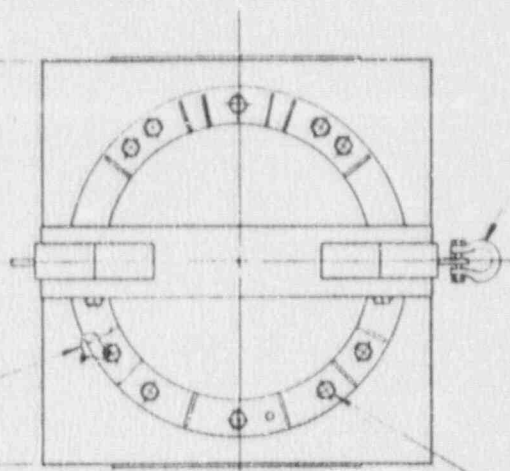
EQUIPMENT CLASS. CODE NA		SAFETY RELATED THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM <input type="checkbox"/> YES <input type="checkbox"/> NO		IEEE CLASS 1E (NUCLEAR SAFETY RELATED) <input type="checkbox"/> YES <input type="checkbox"/> NO	
SIGNATURES		DAY	MO	YR	 Nuclear Energy GENERAL ELECTRIC COMPANY VNG, Pleasanton, CA
DESIGNED BY SCOTT A. MYERS		30	01	01	
DRAWN BY [Signature]		31	01	01	
CHECKED BY [Signature]		31	01	01	
APPLIED PRACTICES		UNLESS OTHERWISE SPECIFIED		NA	TITLE
					ATR CAPSULE LINER
					PIP - CERTIFICATION DRAWING
TOLERANCES UNLESS OTHERWISE SPECIFIED:		2 PLACE DECIMALS ± .00		FRACTIONS ± .0001	
		3 PLACE DECIMALS ± .001		ANGLES ± .1°	
		FORM NO.	REV. NO.		166D8032
		REV. NO.	REV. NO.		0
		DATE	DATE		
		BY	BY		
		CHECKED	CHECKED		
		APPROVED	APPROVED		

166D8032

DIST

68.00 SQ.

\* LOCK WIRE (4)



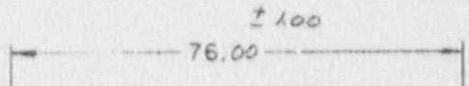
TOP VIEW

(1) \*  
(2) HEX 2.0-  
ASTM  
(10 R)

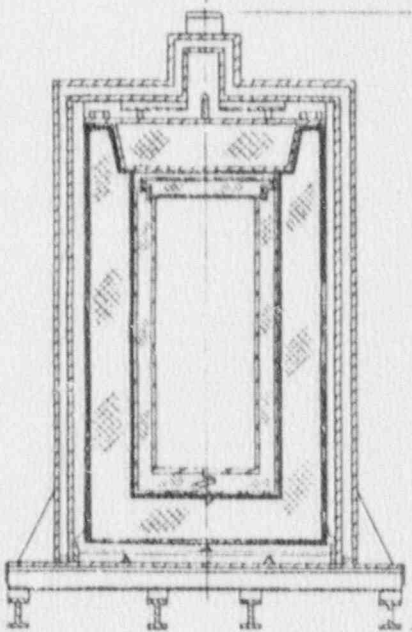
CLOSURE LID  
DWG: 129D4737G2

CLOSURE BOLTS  
1.0-8UNC x 2.25 LG.  
6 REQ.  
ASTM A-520/A-193  
GR. B8 SERMS

(3)

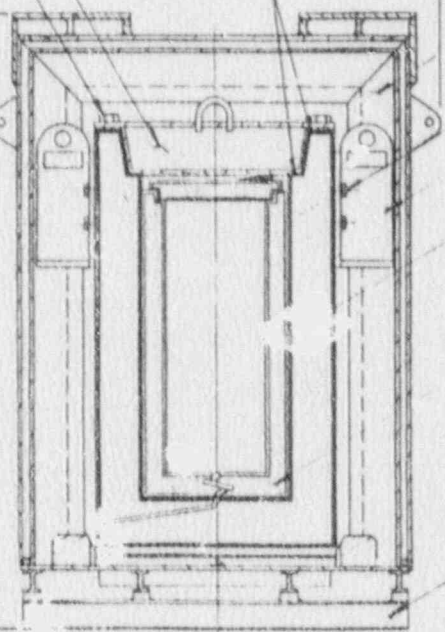


SEAL  
DWG. -  
OR  
(1)



SECTION B-B  
(PACKAGE CROSS SECTION)

94.50



SECTION A-A  
(PACKAGE CROSS SECTION)

(A) HE  
R2

(B) NO  
SEE

(C) SH  
DWG.

LINE  
DWG. - 129  
121  
(S) 166

BA  
DWG.

UNLESS OTHERWISE SPECIFIED USE THE FOLLOWING—			
APPLIED FINISHES	SURFACES	TOLERANCES UNLESS OTHERWISE SPECIFIED	FINISHES
	✓	± .50	

GENERAL ELECTRIC  
 129D4735  
 MODEL 1600 TRANSPORT CONTAINER  
 CERTIFICATION DWG.

IE DOWN SHACKLE

HD. BOLT  
 1.5 UNC-2A x 4.5-5.0 LG.  
 4.449 (OR EQUAL)  
 (QD)

29D4737 G3 OR G3 (UPPER)  
 29D4737 G4 (LOWER)  
 LOCATION OPTIONAL

JACKET  
 DW6-129D4736 G1

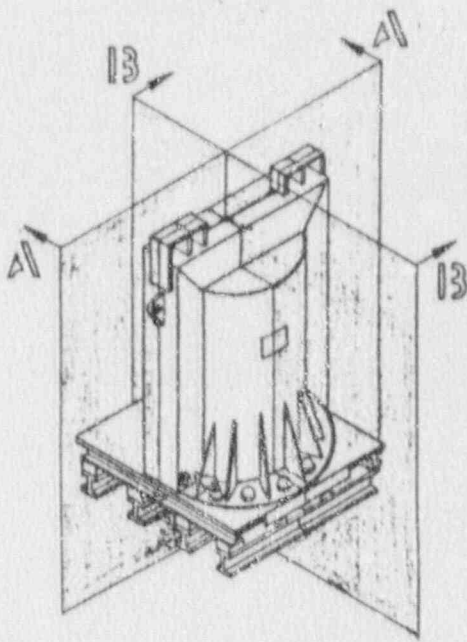
HD. BOLT  
 129D4737 P19

NOMINAL LIFTING EAR  
 NOTE 1

LIFTING CASK BODY  
 129D4737 G1

(ALL LINERS OPTIONAL)  
 129D4738 G1 (SHOWN)  
 129D4738 G2  
 129D8032

129D4736 G2



ISOMETRIC VIEW  
 OF MODEL 1600 PACKAGE

SI  
 APERTURE  
 CARD

Also Available On  
 Aperture Card

NOTE :

1. REDUNDANT LIFTING EARS (NOT SHOWN) ARE USED FOR CERTAIN IN-PLANT OPERATIONS, (SEE 129D4787).
2. BASE AND JACKET INSIDE & OUTSIDE ARE PAINTED WITH RUSTOLEUM GRAY OR EQLM.
3. DIMENSIONS AND TOLERANCES INDICATE MAXIMUM VARIATIONS BETWEEN PACKAGES AND ARE NOT INDICATIVE OF 'FIT' OR INTERCHANGEABILITY.
4. NOMINAL DIMENSIONS FOR STRUT TAPES, PLATES, JOBS, ETC. WILL FALL WITHIN STANDARD MILL TOLERANCE.
5. ALL OTHER DIMENSIONS ARE ± 0.50 UNLESS SHOWN OTHERWISE.
6. PACKAGING WT = 25,500 lbs (+ or - 1000 lbs) WITHOUT LINER  
 30,450 lbs (+ or - 1000 lbs) WITH LINER
7. THE JACKET LIFTING EARS (129D4737P19) ARE BOLTED CLOSED DURING TRANSPORT WITH A SEAL FLAP WHICH IS MARKED TO DENOTE THAT THEY ARE NOT TO BE USED FOR TIE-DOWN OR TO LIFT THE ENTIRE PACKAGE.

\* NOT SAFETY RELATED COMPONENT,  
 SHOWN FOR CLARITY ONLY.

9102140073-02

DESCRIPTION OF GROUP	REV. NO.	REV. DATE	REV. BY	REV. TO
NOT FOR FABRICATION	4	12/18/80	TCT	129D4735
	5	12/18/80	TCT	129D4735
	3	12/18/80	TCT	129D4735
YES	12/18/80	TCT	129D4735	