



Department of Energy
Washington, DC 20585

NOV 05 2007

Attn: Document Control Desk
Director, Spent Fuel Project Office
Office of Nuclear Material Safety and Safeguards
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555-0001

This letter is in reference to Certificate of Compliance (CoC) No. 9315, for the Model ES-3100 Package, Docket No. 71-9315, USA/9315/B(U)F-96. By letter dated September 6, 2007, the Nuclear Regulatory Commission (NRC) issued Revision 6 of the CoC for the ES-3100. By letter dated October 11, 2007, the Department of Energy (DOE) submitted copies of the Safety Analysis Report (SAR) for the ES-3100 to the NRC, and asked for the review and close out of seven specific items.

One of these seven items ("Revision of the manufacturing specification for the neutron absorber material (277-4)") is administrative in nature. DOE is requesting that this item be approved now and not in conjunction with the other six items under review. This request addresses Section 5.(a)(3)(vi) of the CoC. The equipment specification for the neutron absorber material (JS-YMN3-801580) was updated and is now Revision F. DOE is asking that the CoC be changed to reflect Revision F, as shown on the marked-up page 2 of the CoC (attached). The specific updates to the equipment specification are shown (circled with dotted lines) on SAR pages 1-83, 1-97, and 1-110 (attached). These pages are unchanged from the October 11, 2007 SAR submittal and are attached to this letter for information only.

A second administrative change is also requested at this time. This change is not related to the seven items referenced above. This request addresses CoC Section 5.(a)(3)(i), Drawing No. M2E801580A037, Sheets 1 through 6. This drawing has been updated and is now Revision B. DOE is asking that the CoC be changed to reflect Revision B, as shown on the marked-up page 2 of the CoC (attached). In creating Revision B of this drawing, the change was to the format of the serial number on the Trefoil data plate. The format had been Y-12-XXXXX; and was changed to XXXXXXXXXX. This allows more flexibility in assigning serial numbers to these containers. Sheet 2 of 6 of the drawing is provided with this letter for information only. Sheet 2 of 6 is unchanged from the October 11, 2007 SAR submittal.

The original of this letter, with attachments is being sent to the Document Control Desk. Ten copies of this letter with attachments are being delivered to Kimberly J. Hardin, Project Manager, Licensing Branch, Division of Spent Fuel Storage and Transportation, Office of Nuclear Material Safety and Safeguards shortly after this letter is sent.

NMSS01





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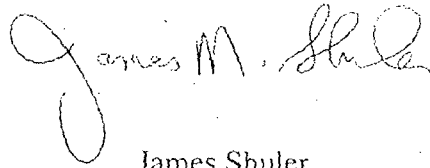
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If you have any questions, please contact me at 301-903-5513.

Sincerely,

A handwritten signature in cursive script that reads "James M. Shuler". The signature is written in dark ink and is positioned above the typed name.

James Shuler
Manager, Packaging Certification Program
Safety Management and Operations
Office of Environmental Management

Enclosure

cc:

Kimberly J. Hardin, NRC
Joe Bozik, NNSA NA-261
Dana Willaford, DOE ORO
Jeff Arbital, BWXT Y-12
Steve Sanders, BWXT Y-12

MARK-UP

NRC FORM 618 5-2002 10-1997		U.S. NUCLEAR REGULATORY COMMISSION				
CERTIFICATE OF COMPLIANCE FOR RADIOACTIVE MATERIAL PACKAGES						
CERTIFICATE NUMBER	REVISION NUMBER	DOCKET NUMBER	PACKAGE IDENTIFICATION NUMBER	PAGE	PAGES	
9315	6	71-9315	USA/9315/B(U)F-96	2	OF	7

5.(a) Packaging (continued)

(3) Drawings

The Model No. ES-3100 package is constructed and assembled in accordance with:

- (i) BWXT Y-12, L.L.C., Drawing No. M2E801580A037, Sheets 1 through 6, Rev. ^{A, B} "Consolidated Assembly Drawing "
- (ii) BWXT Y-12, L.L.C., Drawing No. M2E801580A026, Rev. C, "Heavy Can Spacer Assembly."
- (iii) Equipment Specification JS-YMN3-801580-A001, Rev. E, "ES-3100 Containment Vessel."
- (iv) Equipment Specification JS-YMN3-801580-A002, Rev. D, "ES-3100 Drum Assembly."
- (v) Equipment Specification JS-YMN3-801580-A003, Rev. C, "Manufacturing Process Specification for Casting Kaolite 1600™ into the ES-3100 Shipping Package."
- (vi) Equipment Specification JS-YMN3-801580-A005, Rev. ^F "Casting Catalog No. 277-4 Neutron Absorber for the ES-3100 Shipping Package."

5.(b) Contents (Type and form of material, maximum quantity of material per package, and Criticality Safety Index (CSI)).

The weight of the radioactive contents, convenience containers, can lift attachments, polyethylene bags, spacers, and other material in the containment vessel shall not exceed 90 lb. The maximum mass of hydrogenous packaging materials in the containment vessel (e.g., polyethylene containers or bagging, silicone rubber pads, etc.) shall not exceed 500 grams. The maximum content decay heat load shall not exceed 0.4 watts.

The concentration limits of uranium and transuranic constituents shall be the following:

Isotope	Maximum Concentration
U-232	0.040 µg/gU ^a
U-233	0.006 g/gU ^b
U-234	0.02 g/gU
U-235	1.00 g/gU
U-236	0.40 g/gU
Transuranics (except Np)	40.0 µg/gU
Np-237	0.003 g/gU

^a µg/gU = 10⁻⁶ grams per gram of total uranium

^b g/gU = grams per gram of total uranium

EQUIPMENT SPECIFICATION APPROVAL/REVISION PAGE

SPECIFICATION NO. JS-YMN3-801580-A005	REV. F	ISSUE DATE 02-18-05
PAGE i of ii	REVISION DATE 10/12/2006	
PROCURED BY BWXT Y-12 L.L.C.	INSTALLED BY BWXT Y-12 L.L.C.	
PROJECT TITLE ES-3100 Shipping Package	PLANT Y-12	BUILDING AREA
JOB TITLE Production Design Definition	W.O. OR E.S.O. 7RCPCA08	RECORD NUMBER Y2003-0328
SPECIFICATION FOR Casting Catalog No. 277-4 Neutron Absorber For The ES-3100 Shipping Package	SSC IDENTIFICATION NUMBER NA	

APPROVALS

SIGNATURE	DATE	SIGNATURE	DATE
PREPARED BY G. A. Byington /s/	2/18/05	PROJECT ENGINEER G. A. Byington /s/	2/18/05
DESIGN VERIFICATION M. L. Goins /s/	2/18/05	CRITICALITY SAFETY D. A. T. J. F. DeClue /s/	2/18/05
DISCIPLINE MANAGER D. P. Sooter /s/	11 Feb 05		

REVISIONS/APPROVALS

REV. NO.	DESCRIPTION OF REVISION
A	Issued for Procurement.
B	Changed the minimum LOD from 25.3% to 30.1% at three locations on page 13 section 4.7.3 and one location on page 23 Form D.
C	General changes. Went from an off the shelf item to a two part system of boron carbide plus high alumina cement.
D	General revision. Reformatted sections and attachments. Deleted references to drawing numbers.
E	The mass limits were changed to account for volume tolerances in the 277-4 annulus. Section 3.3.8, Item I, "inner liner" was replaced with "can". A.3.1 was separated into two sections; the second part of A.3.1 became A.3.1.a with the title "Net Count Rate Time Determination". Section A.6.3 was modified by adding "Define the repeatable accuracy for" before the first sentence. JS-YMN3-801580-A005-5 was expanded to include more approval data requirements. A typo was fixed on JS-YMN3-801580-A005-6. Added Rev level to Forms and headers.
F	In Section 3.3.9.3, added maximum and minimum LOD% table based upon cured density and made reference to table on Form F.

SIGNATURE	DATE	SIGNATURE	DATE
PREPARED BY G. A. Byington /s/	10/11/06	PROGRAM MANAGER George Singleton /s/	11/21/06
DESIGN VERIFICATION Monty L. Goins /s/	11/07/06	CRITICALITY SAFETY John F DeClue /s/	11/16/06
DISCIPLINE MANAGER W. I. North /s/	11/21/06	QUALITY ASSURANCE Vaughn Chase /s/	11-20-2006

This document has been reviewed by a Y-12 DC and UCNI RO and has been determined to be UNCLASSIFIED and not UCNI. This review does not constitute clearance for public release.

Name: Roger D. Aigner /s/ Date: 11/8/06

3.3.9.3 Companion Sample LOD Verification

The companion sample cans identified in Section 3.3.7.b shall be LOD tested. The acceptable LOD percent range shall be based upon the companion sample can cured casting density in Section 3.3.9.2. The Acceptable Maximum and Minimum LOD% at Density is given in this table below. This table was developed from data in DAC-PKG-801624-A001, Table 7.

Acceptable Maximum and Minimum LOD% at Density		
Density (lb/ft ³)	Maximum LOD%	Minimum LOD%
100	31.80%	28.61%
101	32.47%	28.33%
102	33.12%	28.06%
103	33.77%	27.79%
104	34.40%	27.52%
105	35.03%	27.26%
106	35.64%	27.00%
107	36.25%	26.75%
108	36.84%	26.50%
109	37.42%	26.25%
110	37.99%	26.01%
111	38.56%	25.78%
112	39.11%	25.55%
113	39.65%	25.32%
114	40.18%	25.10%
115	40.70%	24.88%
116	41.21%	24.66%
117	41.71%	24.45%
118	42.20%	24.25%
119	42.68%	24.05%
120	43.15%	23.85%

- The lid shall have the serial number permanently transferred by vibro etch or other method.
- The lid shall have a small vent hole in it. It is recommended that a nail be used to punch a hole 0.12±0.06 in. diameter in the metal lid from the inside surface of the lid.
- Match the can serial numbers and place the lid on the can.
- The weight of the can shall be recorded on Form F.
- The cans shall be placed in an oven at 1500±150°F (800°C) for 4 hours.
- The weight of the can shall be recorded on Form F with the can temperature not below 100°F.
- Calculate the LOD% using the equation below and record it on Form F. Due to can oxidizing and gaining weight during the heating cycle, a 0.024 lb correction factor is included in the following LOD% calculation.

$$\text{LOD}\% = \left[1 - \frac{(\text{LODWeight} - \text{Empty} - 0.024\text{lb})}{(\text{Cured \& Clean} - \text{Empty})} \right] \times 100\%$$

- Verify that the LOD% is within the acceptable range. If water content is outside the acceptable range, a copy of the form shall be sent to the Company.

FORM F ES-3100 Companion Sample Casting Control and Tests

Casting Company Name		Ave. 10 Can and Lid Empty Weight ^a		Ave. 10 Can and Lid Water Wgt. ^a		Temp. of Water Weight (°F)		Drawing Number M2E801580A026	
Serial Numbers		Can Measurement Weights ±0.01 (lb)			For Record Only	Loss On Drying (Odd Serial Numbered Cans)		PGNAA (Even Serial Numbered Cans)	
Part # or Can Lot#	Companion Sample Can ^a	After Casting Weight	Cured Weight	LOD Weight	Cured Density (lb/ft ³)	Calculated LOD%	Pass Or Fail per Sec. 3.3.9.3	PGNAA (PMN) ^c	Pass Or Fail
Complied by					Comments				

- a For the same lot of sample cans, it is acceptable to use an average weight of ten can bodies and ten can lids.
- b Recommended vibration settings are at 450 VPM and three times the total vibrated weight. The total vibrated weight is the finish cast part and fixtures weight, for a setting of approximately 5 pound-force.
- c Record the PGNAA Measurement Number (PMN) from Form AD for each Companion Sample Can tested.


$$Density = \left(\frac{Cured - Empty}{WithWater - Empty} \right) \times 62.3 \text{ lb/ft}^3$$

$$LOD\% = \left[1 - \frac{(LODWeight - Empty - 0.024)}{(Cured \& \text{ Clean} - Empty)} \right] \times 100\%$$

4 UNCLASSIFIED

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FISSILE RADIOACTIVE MATL CNTR
 BWXT Y-12 LLC
 Y-12 PLANT, OAK RIDGE, TENNESSEE
 CONTAINER MODEL NO. ES-3100
 SERIAL NO. ES-3100 XXXXXXXXXX



5X .25 HIGH CHARACTERS
[6.4]

8
B

.50 HIGH CHARACTERS
[12.7]

.75 HIGH CHARACTERS
[19.1]

ES-3100
 RADIOACTIVE MATERIAL,
 TYPE B(U) PACKAGE,
 FISSILE UN3328
 USA/9315/B(U)/F-96
 MAX. GROSS WT. 420 LBS

4X .38 HIGH CHARACTERS
[9.7]

9

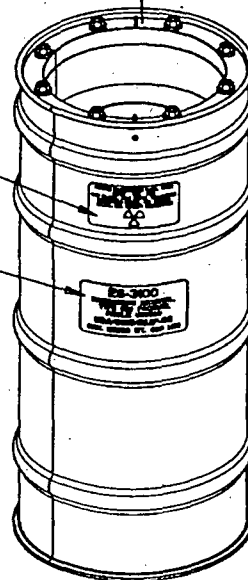
B

8
B

9

2

A



-1 MAIN ASSEMBLY

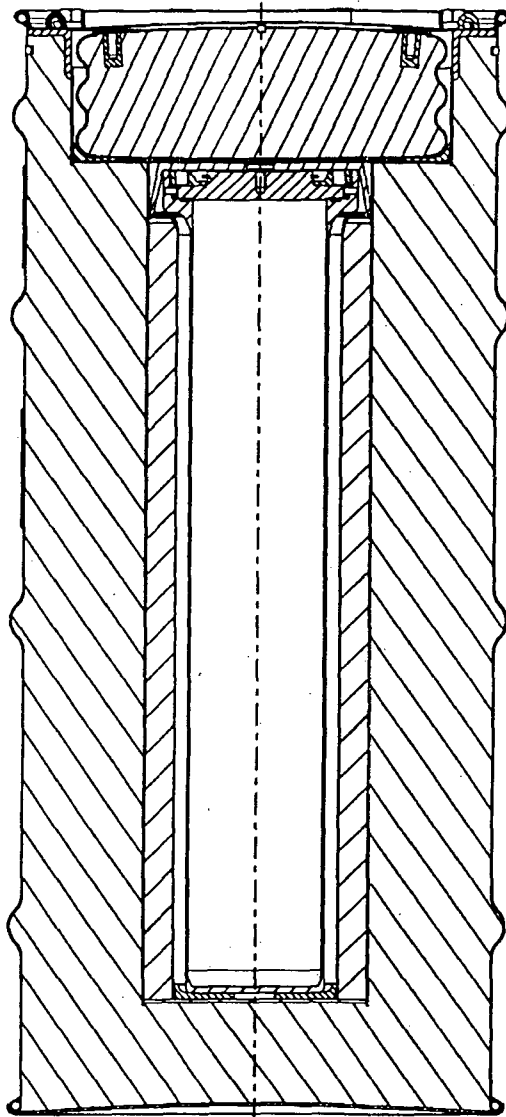
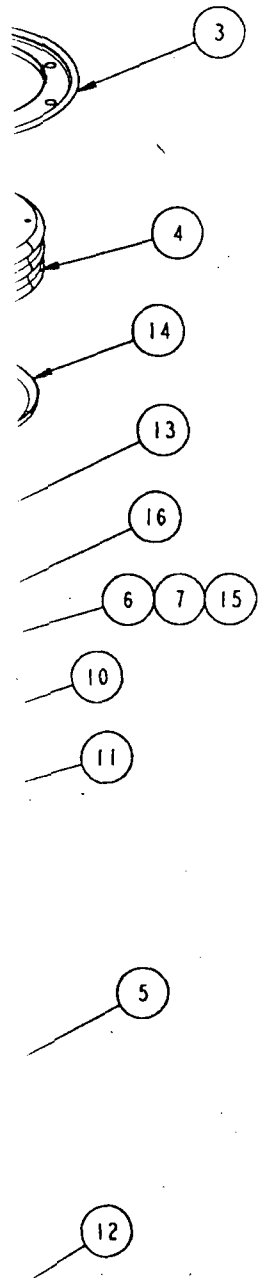
4 UNCLASSIFIED

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UNCLASSIFIED

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D
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M2E801580A037

Y-12 National Security Complex managed by BNL Y-12, LLC
 for the Department of Energy under U.S. Government
 contract DE-AC05-00OR22400
 at Oak Ridge, Tennessee

PROJECT NAME
 ES-3100 SHIPPING PACKAGE

CONSOLIDATED ASSEMBLY DRAWING

REV	DATE	BY	CHKD	APP'D	REASON	QC	NO.	OF	TOTAL	CLASS
6	M	L	F	Y-12	NA	NA	2	6	A	
	CM	PKG	IM		M2E801580A037					REV B

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UNCLASSIFIED

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NOTES

- 1. INTERPRET DIMENSIONS AND TOLERANCES PER ASME Y14.5M-1994.
- 2. DIMENSIONS ARE IN INCHES [mm].
- 3. APPROXIMATE WEIGHT: 325 LBS [147.4 Kg] FOR F/N 1 EMPTY.
- 4. WELDING SYMBOLS SHALL BE INTERPRETED IN ACCORDANCE WITH AWS A2.4.
- 5 SEE EQUIPMENT SPECIFICATION JS-YMN3-801580-A002 ES-3100 DRUM ASSEMBLY.
- 6 SEE EQUIPMENT SPECIFICATION JS-YMN3-801580-A001 ES-3100 CONTAINMENT VESSEL.
- 7 SEE EQUIPMENT SPECIFICATION JS-YMN3-801580-A003 MANUFACTURING PROCESS SPECIFICATION FOR CASTING KAOLITE 1600TM INTO THE ES-3100 SHIPPING PACKAGE.
- 8 SEE EQUIPMENT SPECIFICATION JS-YMN3-801580-A005 CASTING CATALOG # 277-4 NEUTRON ABSORBER FOR THE ES-3100 SHIPPING PACKAGE.
- 9 DURING INSTALLATION OF O-RINGS APPLY A THIN COAT OF SUPER-O-LUBE
- 10 DURING INSTALLATION OF CONTAINER VESSEL LID ASSEMBLY, APPLY A LIGHT COAT OF KRYTOX GREASE TO THE THREADS AND UNDER THE NUT.

D
C
B
A

P THIS DRAWING PRODUCED ON PRO/ENGINEER

A	B	REVISED TREFOIL DATA PLAT F/N B	JR	JRDA	JR	JG	AB	WIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
		PAGE 1: MODIFIED GENERAL NOTES AND UPDATED FIELD NOTES ADDED TOLERANCES TO O-RINGS	RDA	JSL	GAB	JR	JWS	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
		PAGE 3: ADDED CORRECT TOLERANCES AND REF. DIMS. PAGE 4: ADDED CORRECT INSPECTION DIMS. AND WELD SYMS. PAGE 5: ADDED CORRECT TOLERANCES AND INSPECTION DIMS. AND ADDED NOTE TO -5 ADDED SHEET 6 RN Y2003-0328	FOR	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN
O	RN: Y2003-0328 ORIGINAL ISSUE	JMR	GM	GAB	RBC	MLG	MIN	RDA	MIN	JG	MIN	MIN	MIN	MIN	MIN	MIN	MIN	MIN	
REV	DESCRIPTION	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD	DATE	BY	CHKD	
		REVISION OR ISSUE PURPOSE										REVISION APPROVALS							

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