

71-5805



February 26, 2007  
E&L-006-07

Mr. E. William Brach, Director  
Spent Fuel Project Office  
Office of Nuclear Material Safety and Safeguards  
U.S. Nuclear Regulatory Commission  
Washington, DC 20555

**REFERENCES: (1) CERTIFICATE OF COMPLIANCE NO. 5805  
(2) SAFETY ANALYSIS REPORT FOR MODEL CNS 3-55 TYPE B SHIPPING PACKAGING**

Dear Mr. Brach:

**SUBJECT: SUBMITTAL FOR MODEL NO. CNS 3-55 PACKAGE**

Duratek, Inc. (Duratek) respectfully requests an amendment to the Certificate of Compliance for the Model No. CNS 3-55 Package. This amendment is in the form of a revision to Drawing No. MOD-124, VNDB Skid Assembly, to include tolerances for some dimensional measurements. These have been added to the drawing as Notes 6 and 7.

A review of the Safety Analysis Report for the 3-55 has been performed regarding this proposed change. Only the Skid Assembly hold-down straps are evaluated in Section 2.4.4, pages 2-8 and 2-9 (enclosed) of the SAR as a tie-down device. In the analysis, the distance between the hold-down straps is used in the calculation. Evaluating the calculation with a dimensional variation as requested by this change, will not have any adverse affect on the analyses presented in the SAR. We therefore request approval of this revision to the drawing. No other changes to the Certificate of Compliance are being requested.

If you or members of your staff have any questions about the change identified herein, please feel free to contact me at (803) 758-1824.

Sincerely,

Patrick L. Paquin  
General Manager - Engineering & Licensing

Enclosure:

- 1. CNS 3-55 Safety Analysis Report Pages 2-8 and 2-9

Attachments:

- 1. Title Page to Revision 4 of the CNS 3-55 Safety Analysis Report
- 2. SAR Drawing MOD-124, Revision 6

NM5501

9.0 DRAWINGS

LIST OF DRAWINGS FOR CNS 3-55 SHIPPING CASK

<u>Drawing Number</u>		<u>Drawing Name</u>
MOD-100	Rev. 14	Modification of VNDB Cask (LS-6000-1)
C-111-D-0001	Rev. -	3-55 Cask Shield Ring
C-111-E-0002	Rev. 2	CNS 3-55 Lid Detail
MOD-139-1	Rev. K	VNDB Shipping and Storage Cask Engineering Reference Drawing
MOD-140	Rev. C	VNDB Shipping and Storage Cask Closure Detail
MOD-124	Rev. 6	VNDB Skid Assembly
0999-D-07	Rev. 8	Cask, Shock Absorber Detail for Top Cover, Bottom , & Trunnions
0999-C-08	Rev. 9	Vent
C-110-D-5001	Rev. 1	Sunshade for 3-55 Transport Cask

**Enclosure**

**Safety Analysis Report  
Pages 2-8 and 2-9**

### 2.4.3 Lifting Devices (continued)

The maximum bending stress on the trunnion weld is:

$$\begin{aligned}\sigma_{\max} &= \frac{P_e}{\pi r_o^2 t_{tw}} \\ &= \frac{99,969 (3.25)}{\pi (4.0)^2 (1.0)} \\ &= 6,464 \text{ psi}\end{aligned}$$

$$\text{M.S.} = \frac{51,000}{1.5(6464)} - 1 = \overset{5.26}{\text{large}}$$

The maximum shear stress on the trunnion weld is:

$$\begin{aligned}\sigma_s \max &= \frac{P}{2\pi r_o t_{tw}} \\ &= \frac{99,969}{2\pi (4.0) (1.0)} \\ &= 3,978\end{aligned}$$

$$\frac{32,000}{1.5(3978)} - 1 = \overset{5.36}{\text{large}}$$

### 2.4.4 Tie-down Devices

As shown on the drawing, (Reference Drawing MOD-124), the cask is transported in a skid cradle bolted to the truck trailer frame. The vertical and horizontal transverse restraint is through the cradle and the two heavy hold down straps; the horizontal axial restraint (direction in which vehicle travels) is through the kick plates in the skid cradle through the cask closure end pipe buffer shock absorber assembly to the cask itself. There is an upending moment on the hold-down straps in the axial direction to resist the 10g axial load (direction in which vehicle travels).

#### 2.4.4 Tie-down Devices (continued)

The maximum load on a strap with the three combined loads is:

$$P_{\max} = \frac{10W\left(\frac{D}{2}\right)}{2L} + \frac{2W}{4} + \frac{5\left(\frac{D}{2}\right)W}{2D}$$

where: D = outside dia. of cask = 50.5 inches  
 L = distance between hold-down straps = 79 inches  
 W = 70,000 pounds

$$= W \left[ \frac{10 \times \frac{50.5}{2}}{2 \times 79} + \frac{2}{4} + \frac{5 \times \frac{50.5}{2}}{2 \times 50.5} \right]$$

$$= W (1.6 + .5 + .25)$$

$$70,000 \times 3.35 = 234,500 \text{ pounds}$$

Tensile stress in the 8 in. x 1 in. strap is:

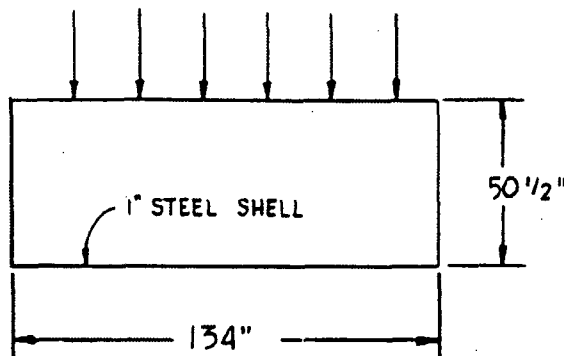
$$\sigma = \frac{P}{A} = \frac{234,500}{8 \times 1} = 29,312 \text{ psi}$$

$$\frac{36,000}{29,312} - 1 = \underline{0.23 \text{ M.S.}}$$

#### 2.5 Standards for Type B - Large Quantity Packaging

##### 2.5.1 Load Resistance

W = 70,000 pounds  
 5W = 350,000 pounds



**Attachment 1**

**Title Page of Revision 4 of the Safety  
Analysis Report**

**SAFETY ANALYSIS REPORT**  
**FOR**  
**MODEL CNS 3-55 TYPE B SHIPPING PACKAGING**

**REVISION 4**

**February 2007**

**Duratek, Inc.**  
**140 Stoneridge Drive**  
**Columbia, SC 29210**

**Attachment 2**

**MOD-124, Revision 6  
Drawing VNDB Skid Assembly**



**THIS PAGE IS AN  
OVERSIZED DRAWING OR  
FIGURE,  
THAT CAN BE VIEWED AT THE  
RECORD TITLED:  
DRAWING NO. MOD-124, REV. 6  
“VNDB SKID ASSEMBLY”  
WITHIN THIS PACKAGE... OR**

**D-01X**