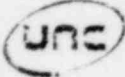


# UNC NAVAL PRODUCTS

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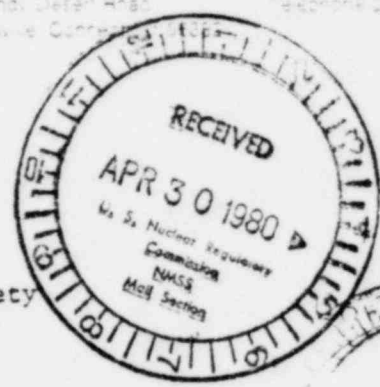
Division of United Nuclear Corporation 67 Sandh Desert Road Telephone 202-848-1531  
- UNC RESOURCES Company - Unconcrete Company

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In reply, please refer  
to: NIS-80-4-41

April 22, 1980

Mr. Charles E. MacDonald, Chief  
Transportation Certification Branch  
Division of Fuel Cycle & Material Safety  
U. S. Nuclear Regulatory Commission  
Washington, D. C. 20555



Subject: Certificate Of Compliance No. 5086  
UNC 2600 Shipping Container  
Docket No. 71-5086

- Reference: 1. Letter - W. F. Kirk To C. E. MacDonald,  
Dated December 20, 1979
2. Letter - C. E. MacDonald To W. F. Kirk,  
Dated March 4, 1980

Dear Mr. MacDonald:

As requested by Reference (2), we are enclosing consolidated Drawing D-20354-6, Sheet 7, Rev. 4 to show important configuration items for this container.

The revised drawing is consistent with the packaging that was subjected to the 30 ft. drop test and the puncture test, except as noted in Reference (1) and repeated below:

1. Stop bar fastening bolts at either end are shown as either the 1/2" diameter with nut and washer, which was tested, or a 5/8" diameter bolt with lock washer tapped into the 3/8" cage plate at either end. No loss of containment strength is associated with this option.
2. Optional banding of wooden blocks to the outside of the container for handling purposes has been provided.
3. The original webbing strap assembly, #837A2, has been revised to a steel banding strap. This modification improves the inner box closure under accident conditions involving heat or fire. However, the steel frame of the outer container is the main control on preventing opening of the inner container.

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Mr. Charles E. MacDonald, Chief  
Transportation Certification Branch  
U. S. Nuclear Regulatory Commission

April 22, 1980

- 4. The use of other equivalent materials to the "oak" block and the specified box "hinge" do not affect the performance of the container under accident conditions.

In answer to the third comment of Reference (2), review of the testing with our Plant Service Supervisor, who was present during the container testing, indicates that the cover was on after the 30 ft. drop but removed for photographing of the front end prior to the penetration test. The cover could not be put on for the penetration test.

The 40 inch penetration test if performed on the end of the package, with or without the cover and bumper in place, would not effect the closure or retention of the inner container.

The 6" diameter penetration pin would partially flatten the rear end handle of the inner container from an original 1-3/4" height to an approximate 1" height while bringing the inner container against the stop bars at far end from the penetration pin. Concurrently, the penetration pin would come against the 3/8" thick end cage plate of the cage assembly, which would absorb most all the impact loading as it moved against the bumper at the welded end closure of the outer container. Centered or off-center impact of the 6" pin would result in the same situation since its dimensions are such that it would not move past the end cage plate.

As an indication of the maximum stresses that would be developed in the eight (8) longitudinal central angles, without consideration of the loading distribution to the remainder of the cage assembly:

$$S = \sqrt{\frac{2E}{AL} \frac{WV^2}{2g}} = \text{Compression } 10,900 \text{ psi}$$

$$\begin{aligned}
 h &= 40 \text{ in.} = 3.34 \text{ ft.} \\
 V &= \sqrt{2gs} = \sqrt{2 (32.2) 3.34} \quad \left\{ \begin{aligned} &= 14.7 \text{ ft./sec.} \\ &= 176 \text{ in./sec.} \end{aligned} \right. \\
 W &= 1,200 \text{ lbs.} \\
 g &= 32.2 \text{ ft./sec.}^2 = 388 \text{ in./sec.}^2 \\
 E &= 30 \times 10^6 \text{ in.-lb./in.}^3 \\
 A &= 4 (.25 \text{ in.}^2) + 4 (.375) = 2.5 \text{ in.}^2 \\
 L &= 96 \text{ in.}
 \end{aligned}$$

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April 22, 1980



Our conclusion is that the penetration test on the end would not affect the integrity of the inner or outer container.

As requested, we are enclosing a consolidated application encompassing past applications and amendments. For your convenience, we have followed the format of Regulatory Guide 7.9, Rev. 1, dated January, 1980.

In order to satisfy a need to ship by May 20, we would appreciate your prompt review of the consolidated application.

Very truly yours,

A handwritten signature in cursive script, reading "W. F. Kirk", is positioned above the typed name.

W. F. Kirk, Manager  
Nuclear & Industrial Safety

jr  
Att.