UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D. C. 20555

DEC 0 6 1979

FCTC:RHO
71-9132

Nuclear Packaging, Inc.
ATTN: Mr. John D. Simchuk
1733 South Fawcett
Tacoma, WA 98402

Gentlemen:

This refers to your application dated October 20, 1978, as amended, requesting approval to deliver the Model No. T-3 packaging to a carrier for transport.

In connection with our review, we need the information identified in the enclosure to this letter.

Please advise us within thirty (30) days from the date of this letter when this information will be provided. The additional information requested by this letter should be submitted in the form of revised pages to the original Safety Analysis Report in order to preserve the continuity of your application. If you have any questions regarding this matter, we will be pleased to meet with you and your staff.

Sincerely,

Charles E. MacDonald, Chief
Transportation Certification Branch
Division of Fuel Cycle and
Material Safety, NMSS

Enclosure:
Request for Additional
Information

1642 266

MODEL NO. T-3 SHIPPING PACKAGE
Docket No. 71-9132

Encl to ltr dtd _____

1. The buckling analysis (Section 1.1.2.3.2.3) does not adequately show the containment vessel would not buckle under normal and accident condition tests in 10 CFR 71. The evaluation should be revised to consider the following items:

   a. The evaluation considered only column-type buckling and did not address other possible modes of buckling (e.g., bending and external pressure). The evaluation should be revised to address other possible modes of buckling and to consider buckling under combined loadings (e.g., axial compression, bending moments and external pressure from the lead).

   b. The buckling analysis concluded that the containment vessel would not buckle elastically (in a column-type mode) but did not show that the membrane stresses would be within elastic limits. The evaluation should be revised to either show that the membrane stresses will be within elastic limits under normal and accident conditions or to evaluate possible inelastic buckling of the containment vessel.

   c. Revise the containment vessel drawings to include the tolerances that will be used to assure the containment vessel, after fabrication, is the intended size and form (e.g., diameter, roundness, straightness, or cylindricity).

2. The evaluation of the one-foot free-drop test (Section 1.6.6) and the 30-foot free-drop test (Section 1.7.1) do not adequately show that the impact limiters would remain attached to the cask under corner and oblique impact orientations. Note that the evaluation of the 40-inch puncture test is predicated upon the impact limiters being in place. Also, the analyses indicate that the degree of protection afforded by the impact limiters at shallow angle impact orientations is not consistent with the g-loads used to assess the integrity of the cask in the stress analyses. The evaluation of the cask under corner and oblique drop orientations should be revised to consider the following items:

   a. The analyses (pages 1-60e(3) and 1-77e) conclude that the base plate would remain attached to the cask. However, the analyses do not consider the reaction forces (and their distribution) that would be needed to hold the foam in position. Also, the analyses do not show that the shroud surrounding the foam is capable of providing these reaction forces without excessive deformation (i.e., deformation in regions other than the region in contact with the impact surface). The analyses should justify the assumption (pages 1-60e(13) and 1-77n) that the shroud would behave as a short cantilever at shallow angle impact orientations.

b. The evaluation of the impact limiters (pages 1-60e(8) and 1-77h) indicates that for various oblique drop orientations, the impact forces would be developed directly at the ends of the cask rather than through the impact limiters. This is inconsistent with the g-loads used to analyze the cask body. The integrity of the cask should be evaluated for shallow angle impact orientations where the ends of the cask contact the impact surface.

c. Provide an engineering drawing showing the dimensions and design features of the impact limiters and the devices that are used to attach the limiters to the cask. Specify the minimum and maximum density foam that will be used to fabricate the limiters. Note that the analyses of the attachment devices (pages 1-60e(13) and 1-77n) considered eight connection points although the drawings of the package show only six.

d. Define the terms and add appropriate narration to clarify the derivation of the expressions used to evaluate internal loads under corner and oblique impact orientations (page 1-60b(3)).

3. The evaluation of the 40-inch puncture test at the top end of the package (page 1-112) apparently contains errors whose effect is to overestimate the amount of kinetic energy that can be dissipated by the precompressed foam. The analysis should be revised to correctly estimate the energy that would be dissipated by the foam. Also, the analysis should should include an evaluation of the 40-inch puncture test at the bottom end of the cask.