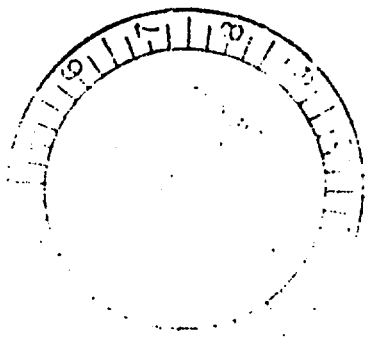
71-9102



NEUTRON PRODUCTS INC

'85 AUG -2 A10:24

July 31, 1985

PDR return to 39655

'85 AUG -5 A10:35

Mr. Charles E. MacDonald, Chief
Transportation Certification Branch
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Subject: Certification of Compliance No. 9102

Dear Mr. MacDonald:

Neutron Products, Inc. is using three shipping packages under Certificate of Compliance No. 9102 and presently finds it advisable to build three more in the near future. While the additional packages could be built of materials identical to the original, improved material have become available since the initial design of the package. This letter is a request to include the use of higher strength and improved fracture toughness steels in the fabrication of the shipping/transfer cask which is the shielded inner container of the subject package.

The physical design of the cask will not be changed. The only change will be in the materials of construction. With the planned change, all of the cask structure which encloses lead will be an ASTM A-516 type carbon steel or an austenitic stainless steel, both of which have superior low temperature fracture toughness properties. The specific changes are itemized in Attachment I. Included are the principal structural properties of the proposed as well as the present cask materials. Review of the safety analysis of records shown unchanged or improved margins for all situations using the new materials.

A dimensional change results as a consequence of limited availability of the A-516 type material in tubular form. The shell liner (Item 6) becomes 3/16 inches thick instead of 3/8 inches thick. While this member provides one of the lead containing boundaries, it does not carry any structurally critical loading and is completely supported in any severe accident condition. Calculations indicate that under normal transport conditions the maximum loading developed in the liner is a compressive thermal stress of 3300 psi due to a maximum temperature difference between the liner and the outer shell of 20° F when the cask is loaded with 9500 ci. Cobalt-60 (equivalent of 150 watts). A differential pressure of 25 psi between the inside and outside of the cask, which is greater than any anticipated in service, develops a liner stress of less than 600 psi. The liner material has a minimum guaranteed yield strength of 30,000 psi and a tensile strength of 60,000 psi or greater

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Under the Hypothetical Accident Conditions the maximum liner stress is calculated to result from a 30 foot top drop generating a 220g average load on the cask. The resulting maximum stress is a localized combined tension and bending stress of 25,300 psi. A structural evaluation of the liner under HAC is provided as Attachment II.

The other dimensional change is functional. The outside diameter of the tubing for the drum liner is reduced from 3 inches to 2.75 inches. The wall thickness remains the same. The change has been made to improve gamma leakage under source changing conditions. The net effect for use as a shipping cask is an improvement in shielding. No other safety question are involved in this change.

It is offered that the proposed additions can be accommodated by altered wording in the following two sections of the certificate:

5 (a)(2) Description
delete ... "by 3/8 inch thick"... in the fourth line.

5 (a)(3) Drawing
following Rev. C in line 2, add "... or 240010, Rev. D..."

The new cask will be designated as Model 240010-D. The package will be Model No. NPI-20WC-6 MkII.

A copy of Neutron Products Drawing No. 20010, Rev. D is provided as Attachment III to this letter. Also enclosed is an application check for $150.00.

Sincerely,

NEUTRON PRODUCTS, INC.

Paul C. Zmola

PCZ/ksg

neutron products inc

MacDonald:SP7