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71-9257

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Nordion International, Inc.  
ATTN: Mr. J. Stirling  
447 March Road  
P.O. Box 13500  
Kanata, Ontario, Canada K2K 1X8

Dear Mr. Stirling:

This refers to your application dated October 25, 1993, requesting a Certificate of Compliance for the Model No. Titan Radiography Device package.

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

Please advise us within 30 days from the date of this letter when the information will be provided. Additional information requested by this letter should be submitted in the form of revised pages. If you have any questions regarding this matter, we would be pleased to meet with you and your staff. Bernard White is the project manager for our review of this application. Mr. White may be contacted at (301) 415-7905.

Sincerely,

Original Signed by  
Cass R. Chappell

Cass R. Chappell, Section Leader  
Cask Certification Section  
Storage and Transport Systems Branch  
Division of Industrial and  
Medical Nuclear Safety, NMSS

Enclosure: as stated

OFC	STSB	E	STSB	E	STSB	E	STSB	E	STSB	C
NAME	BHwhite		LYang		MGBailey		ERZiegler		CRChappell	
DATE	5/20/94		5/20/94		5/20/94		5/20/94		5/24/94	

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GENERAL

1. Revise the application to include only those sections which pertain to the requirements of 10 CFR Part 71. The application for approval as a transportation package should be whole and complete in itself and should contain sufficient information to show that the package meets the requirements of 10 CFR Part 71.
2. Revise the engineering drawings for the Model No. Titan radiography device to include the following information:
  - (a) the dimensions and thickness of the titanium plates (Part Nos. 13 and 14 on Drawing No. K122213-501);
  - (b) the weight and dimensions of the depleted uranium shield;
  - (c) the diameter, thickness and curvature of the titanium s-tube;
  - (d) the code or standard that will be used to qualify, fabricate, inspect and accept or reject the welds which connect the titanium plates;
  - (e) drawing details that clearly show how the depleted uranium shield and the source are restrained during normal and accident conditions; and
  - (f) specify any treatment or coating of the depleted uranium shield to prevent its degradation.
3. Revise the application so that all references to the U.S. Certificate of Compliance for the Titan package refer to No. USA/9257/B(U), (e.g., Note No. 4 on Drawing No. K122213-501).

STRUCTURAL

1. Revise the application to evaluate the package design for the hypothetical accident sequence specified in 10 CFR Part 71. Note that the regulations specify that the 30-foot drop test be conducted prior to the 40-inch puncture test. The tests should be conducted in sequence, with the package oriented in the most damaging position so as to sustain maximum cumulative damage. Note that the application does not contain information to support the statement (page 89) that conducting the puncture test prior to the drop test is most damaging.
  - (a) Provide sketches and narration which clearly show the orientation of the package during the drop and puncture tests.
  - (b) Provide a description and photographs of the damage sustained by the package during the test sequence. Include an evaluation or assessment showing that the package has sufficient structural integrity to meet the requirements of 10 CFR Part 71.
2. Provide "as-built" engineering drawings of the specimens used for the 30-foot drop and 40-inch puncture tests. The drawings should show the dimensions, thickness and materials of construction used for the test

specimens. The drawings should also show the weld sizes, details and methods of fabrication and inspection. Identify any design features, details, sizes, dimension, weights, welds, materials or methods of construction used for the test specimens that are different from those to be used for Titan packages. NRC Inspection Report No. 93211, dated March 30, 1994, notes that the test specimens were not constructed in accordance with an NRC-approved QA program. Justify that the performance of the "as-built" test specimens is representative of the performance of Titan packages under the 30-foot drop and 40-inch puncture test sequence specified in 10 CFR Part 71.

### SHIELDING

1. The Ir-192 source strength is given in terms of "output" activity. Revise the application to specify the maximum activity of the Ir-192 source, and use the maximum activity throughout the application.
2. The post-accident radiation tests should be performed without the source guide tube end cap assembly in place. Note that the lead in the source guide tube end cap assembly may melt during the fire.
3. Provide the normal and accident condition shielding measurement data.

### OPERATING PROCEDURES

1. Revise the operating procedures to specify that the maximum allowable level of non-fixed contamination is  $10^{-5}$   $\mu\text{Ci}/\text{cm}^2$ , as required in 10 CFR §71.87(i)(1).
2. The procedures for shipping an empty package, Section 4-4-4 of the Titan Gamma Ray Projector User's Manual, specify that the active source be replaced with a dummy source assembly. Show how this method is able to detect the presence of an unauthorized source assembly or a source assembly where the cable (pig-tail) has been removed or shortened (see NRC Information Notice No. 90-56, dated September 4, 1990).