

UNITED STATES GOVERNMENT

Memorandum

TO : Files

DATE: July 1, 1963

FROM : *RH Odegaarden*
Richard H. Odegaarden
Criticality Evaluation Branch, DLR

SUBJECT: MARTIN COMPANY - SHIPPING CONTAINER FOR PATHFINDER FUEL ELEMENTS
DOCKET 70-58, JUNE 25, 1963

A meeting was held at Bethesda on the subject license amendment application on June 25, 1963. Messrs. C. W. Keller and John Wachter of Martin Company, and Messrs. Christian Beck, R. L. Layfield, and R. H. Odegaarden of AEC-DLR participated in the discussion.

The shipping container consists of a 5 inch steel pipe centrally positioned in a 22.5 inch diameter container. The container wall is fabricated of modified 18 gauge, 55 gallon drums, and the overall length of the container is 90 inches.

The 5 inch inner container contains 14 tube-in-tube fuel elements, each fuel element containing 10 w/o UO_2 (120 g U-235/element and 1680 g U-235/container). The applicant calculated a multiplication factor of 0.43 for each shipping container.

The applicant stated for 6 containers in a close packed array, the solid angle is 2.5 steradians. This would permit each container to have a multiplication factor of 0.65. The applicant's calculation was well below this.

The applicant assumed a homogeneous system for his calculations. I pointed out to the applicant that a heterogeneous system can be more reactive than a homogeneous system, but because of the 5 inch inner container, I saw no criticality problem.

Mr. Christian Beck was asked to comment on the structural integrity of the container to ascertain that it will meet the 30 foot drop test. He recommended that the supports which extend radially every 12.8 inches be rotated 45 degrees from each adjacent set to increase the container's resistance to crushing. The steel channel, which now runs the full length of the container, could be welded in one foot lengths to the container wall for each radial support to keep its weight down.

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The inner container is closed at one end by reinforced 18 gauge steel. Mr. Beck recommended that this end cap be increased to 1/4 inch steel. He was not positive the 18 gauge outer container would meet the fracture requirements. The applicant seemed reluctant to go to 16 gauge steel drums. Mr. Beck thought the 18 gauge container might meet our requirements, but desired to examine the modified container which they agreed to submit.

I pointed out to the applicant that they should submit procedures to prevent commingling of this material with all other special nuclear material during shipment, transshipment and delivery. I stated what our requirements are and referred them to Part 71.66.