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REVISION TO NRC CERTIFICATE OF COMPLIANCE 5908; FORWARDING FOR NRC REVIEW

Naval Reactors forwards for Nuclear Regulatory Commission (NRC) review a proposed revision to NRC Certificate of Compliance 5908. The revision would permit intermixing U233 and U235 fuel material packaged in 6M shipping drums.

The safety evaluation supporting the proposed revision utilizes provisions in 10CFR71.39 and 40 for assigning a transport index to U233 fuel packages. The certificate of compliance already provides transport indexes for U235 fuel packages. Having transport indexes for both U233 and U235 packages allows the material to be jointly shipped as a Fissile Class III package in accordance with provisions in 10CFR173.396 (f) and (g).

Upon satisfactory review, NRC issuance of a revision to Certificate of Compliance 5908 is requested.

W. P. ENGEL
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Enclosure: (1) Proposed Revision to Certificate of Compliance 5908

Copy to:
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PROPOSED REVISION TO
CERTIFICATE OF COMPLIANCE 5908

Proposed Revision

A Fissile Class II nuclear safety transport index of 2.5 would be provided for 6M drums containing up to 500 grams ^{233}U at an H/U ratio not to exceed 20 for material described in Paragraph 5(b)(1)(ii).

Background

A package with the stated content can now be shipped only as Fissile Class III with a limit of 51 packages per shipment in accordance with Paragraph 5(b)(2)(iii). Providing a Fissile Class II nuclear safety transport index would permit Fissile Class II shipments and "intermixed" Fissile Class III shipments in accordance with 49CFR173.396 (e) and (f), respectively.

Text of Revision

Add the following sentence at the end of Paragraph 5(b)(2)(iii):

"The minimum transport index for Fissile Class II is 2.5."

Justification

Fissile Class II nuclear safety transport indexes can be derived from Fissile Class III limits. Fissile Class III limits, i.e., the number of packages permitted in a shipment are established such that two undamaged shipments and one damaged shipment are subcritical. If A is the Fissile Class III limit, then at least 2A undamaged packages are subcritical and at least A damaged packages are subcritical. Fissile Class II limits, on the other hand, must be such that five undamaged shipments and two damaged shipments are subcritical. The number of packages permitted in a Fissile Class II shipment, B, is then the lesser of 1/5 (2A) and 1/2 (A), or 0.4A. The transport index for Fissile Class II packages is obtained by dividing 50 by the Fissile Class II limit. (The total transport index for Fissile Class II shipment must not exceed 50.) The transport index is thus:

$$\frac{50}{B} \text{ or } \frac{50}{0.4A} \text{ or } 125/A.$$

In general, then, the transport index for a Fissile Class II package is equal to 125 divided by the Fissile Class III limit. This is a conservative method and may result in a transport index higher than one based on specific calculations.

The nuclear safety transport index for the specific case of the 51 drum Fissile Class III shipments permitted by NRC Certificate of Compliance 5908 is 125/51 or 2.45. Rounding up to the nearest tenth results in a transport index of 2.5.