

From: Christopher Staab
Sent: Friday, January 16, 2009 10:03 AM
To: michael.conroy@dot.gov; John J. Miller
Subject: Request: Phone Call to Discuss Following RAI Responses and Suitable Path Forward:

Mike and John,

The statement in the response cover letter from A&DM: "To make the changes to our document to suit your regulators will require a resubmission to ARPANSA, this is a headache that we do not want" is an invalid reason to not respond to U.S. NRC questions on analyses, if the package is to be used for U.S. import or export. A&DM may choose to supplement the SAR to satisfy NRC requirements independent from ARPANSA interactions. The following issues require resolution for the U.S. NRC to revalidate the packaging. We recommend a phone call to discuss an appropriate path forward:

"Thermal:

For RAI 2-3, how will the test oven produce the environment described in S-T-2, Paragraph 728.8:

728.8. The 1985 edition of the Regulations removed the previous ambiguity of "convection heat input in still ambient air at 800°C" but did not specify a value for the coefficient, requiring the designer to justify the assumptions. A significant proportion of the heat input may derive from convection, particularly when the outer surface is finned and early in the test when the surfaces are relatively cool. The convective heat input should be at least equivalent to that for a hydrocarbon fuel air fire at the specified conditions.

For RAI 2-4, you should consider radiation in your analysis, otherwise there is a potential for your package surface temperature to increase.

Shielding:

1.1 Based upon the applicant's desire to use this as a non-exclusive use package and the lack of information regarding certain parts of the shielding configuration and calculations' bases as well as based upon staff dose calculations for the package (as described in the technical drawings) and the proposed contents showing dose rates that exceed the non-exclusive use limits, the NRC may, with the attachment of necessary conditions to the approval, recommend reduced content limits for non-exclusive use transport. Any contents that exceed these staff-derived limits, but still meet the Approval Certificate limits, would need to be shipped as exclusive-use. The content limits for non-exclusive use transport and the requirement to ship contents in excess of the limits as exclusive use would become conditions for revalidation. The calculation work would still need to be done to determine the contents limits.

At this point in time, it appears that only the Cobalt-60 (Co-60) and Radium-226 (Ra-226) sources are of concern. The Ra-226 is a problem due, at least in part, to the presence of decay daughters; these do not appear to have been accounted for in the applicant's analyses. The daughters need to be considered since the source is special form. The discrepancy in dose rates also appears to arise from the use of additional shielding material than the technical drawings show to exist in the package. For example, the dose rate calculation for package Configuration A, which has lead-only shielding, uses 200mm of lead;

the technical drawings indicate that there is only 189.5mm of lead. This is a small thickness, but enough to see the dose rate (Transport Index) nearly double. Not knowing anything about the source drawer (its shielding configuration and its ability to keep the source centered in the package) requires certain assumptions to be made which in turn may need to be stipulated as conditions of revalidation. Lastly, there is a question as to the package surface for defining distances and application of dose rate limits. The TS-R-1 regulations state that the the dose rate at any point on the package surface should be less than 2mSv/hr and the TI at 1 meter from the surface be 10 or less for non-exclusive use. At the ends of the package, the surface of the package is at the end caps of the attenuator case since the crumple shell does not cover this area on either end of the package.

1.2 TS-R-1 explicitly states in Paragraph 501(b) that: "For each Type B(U), Type B(M) and Type C package ... it shall be ensured that the effectiveness of its shielding ... are within the limits applicable to or specified for the approved design." This means, that each fabricated package must be able to contain the maximum approved contents as set forth in the Approval Certificate for that design. If it cannot do this, it is a defective package that cannot be used. NRC agrees this would require a change to the SAR, since this affects two sections in the SAR that deal with this operation/acceptance test. This is resolved by placing a condition on the revalidation that the shielding of fabricated packages shall be, prior to first use, shown to be effective for the maximum allowed contents (that for non-exclusive use, the package can meet the contents limit set in the conditions for revalidation or set in the Approval Certificate, whichever are applicable for non-exclusive use) for the applicable package configuration using the procedure on page 237 of 276 of the application. Packages that do not meet this condition shall not be used.

1.3 The items discussed in this question are requirements given in the TS-R-1 and are therefore required regardless of local jurisdictions' additional criteria. The appropriate paragraphs of the regulations were cited in the question. Incorporating these in the application would probably also require SAR modifications. However, this item is resolved by making performance of the items requested in the RAI a condition of revalidation.

1.4 A part of the application references materials that appear to be part of the application/SAR. The question was to have those items provided, not to generate new material. If these things are not part of the SAR, why are they pointed to as being part of the SAR? Why are they not in the materials submitted? It is the purview of the package designer to establish the essential elements of the operations for package use, while site/user-specific procedures are developed from those essential elements. This material may still be included in the application; yet it was not clear to the staff that such is the case. Thus, clarification is needed.

1.5 Staff does not think the question (regarding wipe tests) was understood. However, further review indicates this is something that staff does not need to pursue further.

Additionally, the applicant sent a number of drawings with their response. However, Drawing No. 1860A-B1-010-00 had problems with viewing the second page of the drawing.

Also, there needs to be a technical drawing for the source drawers in, or referenced by, the approval certificate since this item appears to be relied upon to maintain the source position and provide axial shielding. If there is a different item used for the Co-60 pencils, that drawing would need to be provided as well. However, this may be dealt with by listing certain requirements upon the source drawer designs as conditions of revalidation.

Regarding the drawings in general, it is noted that technical drawings, which are to be a part of the certificate of approval, are included in the engineering report submitted with the application. It is not clear that this report is part of the SAR that is referenced in the certificate. Thus, to ensure the drawings are a part of the certificate, there should be a condition of revalidation that indicates the packagings shall be fabricated in accordance with the technical drawings contained in the engineering report. (Staff did not see anything that appears to be a technical drawing in the SAR or its appendices.)

It is not clear that the puncture tests for hypothetical accident conditions included tests through the package ends (where crumple shield does not cover) at the end caps. The size of the opening is such that the puncture bar can access the end caps of the attenuator cask. This area can be vulnerable to damage and should be evaluated for/included in this test.

Further, there are other items staff is looking at to add as conditions for recommending revalidation. These include checks of surface contamination on the attenuator case as well as the crumple shield since the crumple shield is open and would allow access of debris to the attenuator case surface. Another condition is a clarification that only Co-60 pencil sources may be loaded in package Configuration D and that the other three sources in this configuration are only point sources."

Please advise a suitable time for a phone call with the appropriate stakeholders.

Very Respectfully,

Chris Staab
NRC Project Manager
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E-mail Properties

Mail Envelope Properties ()

Subject: Request: Phone Call to Discuss Following RAI Responses and Suitable Path
Forward:
Sent Date: 1/13/2009 8:59:53 AM
Received Date: 1/16/2009 10:02:00 AM
From: Christopher Staab

Created By: Christopher.Staab@nrc.gov

Recipients:
 michael.conroy@dot.gov (michael.conroy@dot.gov)
 Tracking Status: None
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 Tracking Status: None

Post Office:

Files	Size	Date & Time
MESSAGE	16713	1/13/2009

Options

Expiration Date:

Priority: olImportanceNormal

ReplyRequested: False

Return Notification: False

Sensitivity: olNormal

Recipients received: ZZZ