October 5, 2017

NNSA Response to NRC Request for Additional Information

Docket No. 71-9355
Model No. 435-B, Revision 4.2

By letter dated July 21, 2017, NRC requested additional information (RAI) regarding the 435-B package amendment, SAR Revision 4.2. A teleconference was held on August 22, 2017, to further discuss the RAI. The RAI as well as the response, along with a detailed list of changes made to the SAR, is given below.

RAI-St-1 Provide a detailed description of the condition of the package after free drop tests and puncture test after replacing previously approved rubber tipped stainless steel bolts with bare bronze bolts used to secure the Long Term Storage Shield (LTSS) using toggle clamps.

Section 1.3.3, "Packaging General Arangement Drawings," Drawing No. 1916-01-02-SAR, "435-B LTSS Lodgment SAR Drawing," includes changes to items 17 and 18 of the "List of Materials." These items are a bronze hex bolt and locknut for use with the toggle clamps. Toggle clamps are used to secure the LTSS to the LTSS lodgment. Previously, the toggle clamps engaging the LTSS were rubber tipped stainless steel bolts. The applicant requested using bare bronze bolts instead of rubber tipped stainless steel bolts. Previous drop tests (Test series D1 and D2) indicated that there was damage to the toggle clamps and/or that they had become unclamped. Additional damage to the toggle clamps and/or the LTSS is expected with bronze bolts since this material is relatively stiffer than rubber, and expected to transmit higher forces.

This information is needed to determine compliance with 10 CFR 71.71(c)(7) and (10), and 10 CFR 71.73(c)(1) and (3).

RAI-St-1 Response: The applicant notes that the toggle clamps are not important to safety because they do not secure the LTSS within the lodgment. The toggle clamps only serve to stabilize the LTSS during transport to reduce unwanted motion, but they do not secure it. In this way, the toggle clamps function as dunnage, and do not fulfil a safety function. From a safety standpoint, the LTSS is controlled by the lodgment structure. This was demonstrated in the certification testing by the fact that, despite damage to the toggle clamp bolts and clamp bodies, the LTSS did not incur significant damage in the worst-case HAC free drops. The material for the adjustment bolts used in the certification testing was steel.

Also of note, because the rubber tips are not important to safety, they were not used in the testing. Thus, the consequences of having no rubber tips on the bolt heads is already demonstrated by the tests.

The rubber tips were introduced in order to prevent possible cosmetic damage (marring) to the surface of the LTSS from the bare steel bolt head. They were configured as a relatively thin rubber cover, fitted over the adjustment bolt head.

Subsequently, a review of all non-metallic materials within the 435-B package was made. Revision 4.2 of the SAR provides a demonstration that all non-metallic materials remain well below their decomposition temperatures. Where this could not be demonstrated in any instance, the non-metallic components were revised or removed. The rubber tips could fall off of the bolt heads during an impact event, and come in contact with hot surfaces. In consultation with the client, it was decided that a bronze bolt would be adequate to prevent significant cosmetic damage to the LTSS surface by the toggle clamp forces, and the rubber tips were eliminated. The bronze production bolts will not change the performance of the 435-B package or the LTSS under NCT or HAC.

To better depict how the toggle clamps stabilize the LTSS, Figure 1.2-6a has been added to SAR Chapter 1. A discussion of the toggle clamps and bolts relative to the certification tests has been added to Section 2.12.3.3 as a new paragraph number 18. Notations have also been added to Table 2.12.3-1, Figure 2.12.3.3-2, and Figure 2.12.3.3-3.