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United States Nuclear Regulatory Commission

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Comments on

Standard Format and Content of Part 71 Applications for Approval of Packaging for Radioactive Material, Draft Regulatory Guide DG-7003, dated December 2003

1. **Paper Stock**: The draft Design Guide (DG) identifies the paper weight as 20 pound for duplex printing (i.e., both sides) or 16 to 20 pound for single side printing. The DG should identify these paper stock weights as the “minimum” poundage acceptable. Some duplex printers require a heavier weight paper (e.g., 28-pound) in order to print properly.
2. **General Comment**: The draft DG identifies that references be placed in the appendix of each section. Safety Analysis Reports (SARs) that have been submitted and approved by the NRC have utilized footnotes as a method of identifying references (e.g., TRUPACT-II, HalfPACT, and GNF-A NPC SARs). The DG should state that other methods for reference identification are acceptable.
3. **General Comment**: The draft DG does not identify requirements for electronic submittals of either a complete application or computer input/output files that are used in the structural, thermal, shielding, and/or criticality evaluations. Electronic guidelines for submittals should be included in this DG.
4. **§1.2.2, Containment System**: This section states to define the exact boundary of the containment system, including a sketch. §4.1.1, *Containment Boundary*, requires essentially the same information with the addition of further details. Based on the requirements of §4.1.1, it appears that §1.2.2 is a duplication of the containment boundary definition requirement. Suggest that this section be revised to clarify the content required versus the content requirements of §4.1.1.
5. **§1.3, General Requirements for All Packages**: This section states that the requirements of 10 CFR §71.43, *General Standards for All Packages*, should be addressed. However, only the requirements for *Minimum Package Size* (§1.3.1) and *Tamper-Indicating Feature* (§1.3.2) are identified at the subsection level. The other general requirements of 10 CFR §71.43 should also be identified in this section. The other criteria that should be identified are:
 - a. Positive Closure
 - b. Chemical and Galvanic Reactions
 - c. Protection of Package Valve or Other Device
 - d. No Reduction of Packaging Effectiveness under the tests of §71.71, *Normal Conditions of Transportation*.
 - e. Accessible Surface Temperature Limit – Exclusive Use/Non-Exclusive Use
 - f. Continuous Venting
6. **§1.4, Appendix**: This section states that the drawings should be included in “Appendix 1.3”; the correct reference should be “Appendix 1.4”. Additionally, this section should reference NUREG/CR-5502, *Engineering Drawings for 10 CFR Part 71 Package Approvals*, for guidance in preparing engineering drawings.

Comments on NRC's Draft DG-7003

7. §2.2.2, Chemical, Galvanic, or Other Reactions: As noted in Comment 3, this section is a requirement from §71.43, *General Standards for All Packages*, and hence, should be provided in DG §1.3, *General Requirements for All Packages*.
8. §2.5.1, Evaluation by Test: This section requires a significant amount of information that has historically been supplied in a test appendix, i.e., *Certification Tests*. These appendices usually include a large number of photographs, data sheets, and/or other graphical information that were obtained during the testing. Test appendices can be as large as 100 pages. By requiring this information in the main body of the structural evaluation section rather than just a summary of the tests, the section will increase in size, creating a large separation from the following sections. Suggest modifying this section to require summarizing the certification testing, with reference to an appendix for details.
9. §2.5.1, Evaluation by Test, 4th Paragraph: This section states that the dimensional tolerances for the prototype or model are to be specified, and that these dimensional tolerances are to be compared to the tolerances that will be used for the package. This statement is not sufficiently clear whether a quantitative or qualitative comparison is required. The section should clarify what type of comparison is required. Note that if a quantitative comparison were required, then fabrication tolerances would essentially become the SAR tolerances for all dimensions, both non-critical and critical.

The section also states to provide detailed drawings that show its dimensions and materials of construction. As currently written, an applicant would be required to create and include essentially another set of engineering drawings in addition to the general arrangement drawings required for Appendix 1.4. This requirement adds significant cost and bulk to the SAR. Rather than a totally independent drawing set, it is suggested that a descriptive comparison between the prototype or model and the package. Examples of this type of comparison are provided in the TRUPACT-II and HalfPACT SARs.

10. §2.5.2, Evaluation by Analysis: It would appear that this section requires a significant amount of information that would also be required in §2.6, *Normal Conditions of Transport*, and §2.7, *Hypothetical Accident Conditions*. For example, the last paragraph states that "*The analysis should show how of the kinetic energy will be dissipated and what local deformation and dynamic forces occur during impact*". Note that the statement does not identify whether the "impact" is for normal conditions of transport (NCT) or hypothetical accident conditions (HAC) free and/or puncture drops. This same information would also be required for NCT and HAC free drops per §71.71 and §71.73 respectively. It is suggested that this section be revised to require only the discussion of the analysis technique(s) and analysis model(s) be stated, and that the analysis results are discussion in their appropriate section, i.e., §2.6 or §2.7.
11. §3.3.1, Evaluation by Analysis: It would appear that this section requires a significant amount of information that would also be required in §3.4, *Thermal Evaluation Under Normal Conditions of Transport*, and §3.5, *Thermal Evaluation Under Hypothetical Accident Conditions*. For example, the last section of this section states "*Clearly describe any models and modeling details.*" These modeling details would also be required for §3.4 and especially §3.5 to describe the modeling details to address damage due to the free and puncture drop tests of §71.73. It is suggested that this section be revised to require only the discussion of the analysis technique(s) and analysis model(s) be stated, and that the analysis results are discussion in their appropriate section, i.e., §3.4 or §3.5.

Comments on NRC's Draft DG-7003

12. **§3.3.2, Evaluation by Test:** It would appear that this section requires a significant amount of information that would also be required in §3.4, *Thermal Evaluation Under NCT*, and §3.5, *Thermal Evaluation Under HAC*. In addition, discussion of facilities and equipment may also be identified in the discussion of *Certification Tests* that are normally delineated in a structural evaluation appendix. Suggest that this section only stated to provide a summary of evaluation by test, with the details provided in their appropriate section, i.e., §3.4 or §3.5.
13. **§3.3.3, Margins of Safety:** This section requires identification of thermal margins of safety for the package temperatures, pressures, and thermal stresses. This same information is also required under §3.4 and §3.5, which are more suited for discussion of their applicable results. Suggest elimination of this section so that there is no duplication of thermal results in the later sections.