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To: Rules and Directives Branch
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US Nuclear Regulatory Commission
Washington DC 20555-0001

From: Rose Montgomery,
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Date: 3/9/04

Re: Comments on Draft Regulatory Guide DG-7003 (Proposed Revision 2 of Regulatory Guide 7.9)

As an engineer specializing in radioactive packaging design, I have become very familiar with the format currently provided by the May 1986 Proposed Revision 2 of Regulatory Guide 7.9. Over the past ten years I have been involved in at least eight different packaging submittals, and an even greater number of packaging design projects. Since a large portion of my daily work is dedicated to producing packaging Safety Analysis Reports, I feel that I can provide a very experienced User viewpoint on the proposed draft guide.

I've provided my comments on DG-7003 as an attachment to this memo. The comments generally follow the layout of the Reg Guide. Some comments are fairly trivial, dealing with typographical errors and the like; however, I feel that others are more important and I have highlighted these in italic type.

Please feel free to contact me at the address, phone numbers or email listed above if you have any questions.

Best regards,

Rose

Rose Montgomery,
Montgomery Engineering & Technical Services

Attachment:
1) Comments on Draft Regulatory Guide DG-7003 (Proposed Revision 2 of Regulatory Guide 7.9)

E-RIDS = ADM-03
Add = N. Osgood (NLO)

Template = ADM-013

Comments on Draft Regulatory Guide DG-7003 (Proposed Revision 2 of Regulatory Guide 7.9)

Montgomery Engineering & Technical Services,
Johnson City, Tennessee
3/9/04

Page Number	Section Number	Comment
5	*1.2.1*	*The guide lists the maximum filled and minimum empty weight as items to include. The guide should be clarified to indicate that the maximum filled weight should be less than or equal to the weight of the package evaluated for structural integrity (both NCT and HAC) in Section 2. The guide should also be clarified to indicate that the minimum empty weight is the nominal weight of the packaging (empty) with all attachments (as applicable). The guide should also request that the application include the estimated manufacturing tolerance of the weight, taking into account the allowable variances (per the drawings) in the raw material and parts used to manufacture the packaging.*
6	1.2.3	Clarify the meaning of minimum and maximum weight
6	1.3	The heading used, "General Requirements for all Packages," is confusing, since only two are listed for this section. It would be less confusing if the Minimum Package Size requirement were added under Section 1.2.1 and the Tamper Indicating Feature were placed under Section 1.2.2 and the "General Requirement" heading was removed.
7	1.4	Typographical error, "Appendix 1.3" should be "Appendix 1.4"
7	*1.4*	*This section should be revised to include guidance on supplying manufacturing specifications for items that are not produced to generally recognized standards (e.g., ASTM) and have a significant impact on the performance of the packaging. For example, polyurethane rigid foam insulation, coatings, blanket insulations, neutron or gamma shielding, etc. Additionally, the specifications should be reflected on the packaging drawings.*
7	2.1.1	The first two bullets are repetitive information, since they appear in later sections and should not be calculated or discussed in depth in the Discussion Section. It would be less taxing to defer these items, as they appear in detail in following sections.
8	2.1.3	Clarify the meaning of "Weight." It appears that the nominal weight is called for.
8	2.2.1	Recommend that the heading be revised to "Mechanical Material Properties." These material properties should be traceable to either a recognized general specification such as ASTM, or to a specification provided in Section 1.4.
9	2.2.3	Recommend this heading be revised to "Effects of Radiation on the Materials of Construction."
9	2.3	While it is understood that the fabrication methods and extent of examination greatly influence the reliability of the packaging, especially when a particular weld, process, or part is being credited for structural stability, this information has been addressed in Section 8 in the past and still appears to be addressed in Section 8 in this draft. It may be more appropriate to ask the applicant to identify the important welds, processes, or parts in this section in order to assure that they are properly fabricated and examined on the drawings, specifications and Section 8.

Page Number	Section Number	Comment
10	*2.5*	*First, the heading "General Considerations" is too broad. A more descriptive heading may be "Methods for demonstrating Compliance." Second, this section is difficult to address, since many times several different models and approaches are used to analyze the package. Describing them all in a single section may be confusing. It may be more helpful to provide this information as general guidance under Section C, stating that each evaluation (applies to all, including structural, thermal, shielding, criticality, containment) should fully describe the model/prototype, conditions, etc, and refer to this guidance in the appropriate sections (e.g., 2.6, 2.7, 3.4, 3.5).*
11	2.6.1	The thermal evaluation is provided in Section 3; thus, it is possible to summarize both heat and cold in this section as "Temperature Effects." The applicant should qualitatively describe any effects on the packaging and payload due to heat or cold, including any phase changes, thermal expansion effects, shrinking, brittle behavior, etc, and their effect on the operation of the packaging. The applicant should be advised to examine the worst case condition (heat or cold) in Sections 2.6.1.1 through 2.6.1.4.
11	2.6.1.1 through 2.6.1.4	It seems that these sections would be more efficiently listed: 2.6.1.1 Summary of Pressures and Temperatures (no change) 2.6.1.2 NCT Stress Calculations 2.6.1.2.1 Stresses due to differential thermal expansion 2.6.1.2.2 Stresses due to pressurization 2.6.1.2.3 Stresses due to mechanical loads 2.6.1.2.4 Combined Stresses 2.6.1.2.5 Comparison with Allowable Stresses
12	*2.6.4*	*The word "possibility" implies that a risk assessment analysis is necessary. Suggest, "Evaluate the packaging for buckling."*
12	2.6.6	"Ensure that this test has no significant effect on material properties" should be revised to "Evaluate the effects of water on the material properties of moisture-sensitive components, for example, wood, fiberboard, paper honeycomb, and open-cell foam products may exhibit reduced strength when wet."
13	*2.7.1*	*It appears that other package components must be assessed for the combined load of a 30-ft drop and a puncture drop, as well as internal pressures and thermal stresses. Please clarify the combination of the 30-ft and puncture drops – is this meant to be the deceleration of the 30-ft drop and the deformation of the puncture drop?*
14	2.7.1.5	This section is superfluous, as a complete summary of damage is given in Section 2.7.8.
14	2.7.4.2 through 2.7.4.4	These sections could be re-organized similar to the suggestion for Section 2.6.1.1.
15	2.10	"As applicable," should be removed.
17	3.2.2	"As appropriate" should be replaced by " that are important to the thermal performance of the package." These technical specifications should be provided in Section 1.4 and called out on the drawings.
17	3.3	Same comment as Section 2.5.
18	3.4.2	Hydrogen generation and flammability should have been addressed in Section 2.2.2.
20	4.1.2	This section appears to be misplaced. Suggest it is more appropriate in 1.2.3.
20	4.2	Same comment as Section 2.5.
22	5.3	This section does not appear to contain information concerning code benchmarking consistent with Sections 2, 3, and 6.

Page Number	Section Number	Comment
25	*6.3.4*	*This section should clarify that the internal moderation should consider both water moderation and moderation by any hydrogen-containing pre-packaging materials used with the payload. In particular, when the pre-packaging materials have a hydrogen density greater than that of water (for example, polyethylene buckets used to pre-package material for transport in the packaging), the applicant should demonstrate that the optimum multiplication factor calculated with water moderation is unaffected by the addition of these materials, even when re-distributed by HAC conditions (as applicable) or the material should be modeled explicitly. Additionally, the applicant should consider the absence of the materials (as applicable).*
27	*6.8*	*The criticality evaluation section of the SAR has historically included a benchmarking section, with each applicant providing a benchmark of the code used. This is inconsistent with the requirements of the structural, thermal, and shielding sections; in these sections, it is only necessary to show that the code is well benchmarked. The use and accurate result of all of these codes (structural, thermal, shielding) is dependant upon the skill of the analyst as well as the accuracy of the code, yet individual applicant benchmarking is not required only for the criticality section. Internationally recognized codes such as SCALE and MCNP should be provided with universally accepted bias values by the manufacturer or by a User's Group for use within specific parameters, and NRC should take the lead in organizing this effort. The applicant should only be required to benchmark those portions of the code that are not within the universally accepted benchmark. Suggest this section be revised to be consistent with Sections 2, 3, and 5.*