Comment Resolution on Spent Fuel Storage and Transportation Division Draft Interim Staff Guidance 18, "The Design and Testing of Lid Welds on Austenitic Stainless Steel Canisters as the Confinement Boundary for Spent Fuel Storage," May, 2008

Commentor No. 1

Comment No. 1.1

The current revision of Interim Staff Guidance (ISG) 18, Revision 0, is applicable to both confinement (storage) and containment (transportation) boundaries while draft ISG-18 Revision 1 is only applicable to confinement boundaries for storage systems. According to the memorandum from Geoff Hornseth to E. William Brach dated November 19, 2007 (ML072410347), references to transportation casks were removed, because containment boundaries on transportation canisters are not presently constructed with welded lids nor are any such expected in the future.

While the current state-of-the-art does not include welded containment systems, ISG-18 should not automatically preclude containment boundaries. Inclusion of containment boundaries for transportation canisters in ISG-18 would help to maintain consistency between storage and transportation where appropriate and provide guidance if the current state-of-the-art for transportation canisters advances to include welded containment systems. Therefore, ISG-18 Revision 1 should be modified to include a discussion of containment boundaries.

Resolution

Comment not incorporated.

The staff agrees that consistency between the storage and transportation regulations is desirable. However, the staff declines to incorporate a discussion regarding transportation into this revision. The lid designs addressed by the draft guidance are approved lid designs which satisfy the design requirements for storage-only conditions. The staff has not examined whether these same lid designs would be adequate under the loadings that would result from the design accident conditions of transportation. Generally, Part 72 confinement boundaries have not been analyzed (or credited) for conformance with Part 71 performance requirements. Hence, extension of the guidance for Part 72 lid closures to Part 71 is inappropriate absent design-specific details and analyses. The staff has removed the statement that implies none are expected in future, and would review any such future design application, as appropriate.

Comment No. 1.2

The proposed draft ISG-18 Revision 1 requires a minimum of three weld layers for a weld to be eligible for exemption from helium leakage testing. However, the draft ISG does not provide a technical justification for requiring a minimum of three layers. Therefore, it is suggested that the technical justification for this requirement be added to draft ISG-18 Revision 1.

Resolution

Comment incorporated.

The following footnote is added to the draft ISG:

> Under this guidance, the term “multi-pass weld” means a weld with three or more individual layers of weld metal. Each layer may be composed of a single weld bead or several adjacent weld beads of common thickness. The minimum of three layers will minimize the probability of a weld flaw propagating through the weld layers resulting in a leakage path.

Comment No. 1.3

Line 189, Line 198 (2 occurrences), Line 201, and Line 240: It is suggested that “cover plate” be changed to “vent-and-drain port closure plate” to be consistent with the terminology first introduced at lines 183 and 184.

Resolution

Comment incorporated.

Comment No. 1.4

Line 194: It is suggested that “(excluding purging/welding gas)” be changed to “(use of purge or backing gas for welding operations is not considered filling or pressurizing)” which is the wording from lines 236 and 237. This change provides consistency and clarity.

Resolution

Comment incorporated.

Comment No. 1.5

Line 226: It is suggested that “partial penetration” be removed as it is unnecessarily specific.

Resolution

Comment incorporated.

Comment No. 1.6

Lines 227 and 228: It is suggested that these lines be modified to read as follows: “continues through the small weld joining the vent-and-drain port closure plate and back to the shield lid again.” The proposed change removes an unnecessarily specific weld designation and improves consistency with lines 183-184.

Resolution

Comment incorporated.

Comment No. 1.7

Lines 241 through 243: It is suggested that the sentence beginning with “Since this weld...” be replaced with the following modified wording from Lines 198 through 202 as modified in Comment No. 5 in order to improve clarity and consistency and to more accurately reflect industry practice:

> “Since the drain-and-vent port closure plate weld may have potentially been pressurized from underneath due to assumed leakage from the closure valve, it must be helium leakage tested in accordance with the methods described in ANSI N14.5-1997. If there are other drain-and-vent, closure plates, and welds, they shall also be helium leakage tested.”

Resolution

Comment incorporated.

Comment No. 1.8

Lines 256 through 259: It is suggested that this paragraph be replaced with the following modified wording from Lines 191 through 193 in order to improve clarity and consistency:

> “This large canister shell to lid weld is exempted from the helium leakage test. This is because the canister shell to lid weld is a large, multi-pass weld meeting the flaw tolerance and other guidance of ISG-15, and the appropriate portions of this guidance.”

Resolution

Comment incorporated.

Comment No. 1.9

Lines 270 and 271: It is suggested that the sentence beginning with “The two designs…” be modified as follows to improve clarity: “The two designs discussed above are considered to have met this requirement.”

Resolution

Comment incorporated.

Comment No. 1.10

Line 296 and 297: It is suggested that wording be added to clarify the phrase: “maximum depth allowed by the ISG-15 calculation method”.

Resolution

Clarification added.

Comment No. 11

Lines 294 through 300: These lines describe a method to be used to limit the amount of weld deposit in the root pass. It is suggested that wording be added to indicate that alternate methods may be used if the intent of this paragraph is met.

Resolution

Clarification added.

Comment No. 12

While it is understood that NRC has not endorsed Code Case N-595-4 or its previous revisions, the language currently proposed in draft ISG-18 Revision 1 may discourage Certificate of Compliance (CoC) holders from requesting NRC approval of elements of the Code Case under the "Code Alternatives" section of the CoCs as described in ISG-4. In addition, the current language may have the unintended consequence of discouraging licensees from N-stamping a canister that meets both the requirements of Code Case N-595 and the CoC. Therefore, it is suggested that clarifying language endorsing the Code Alternative process in the CoC and ISG-4 be added to ISG-18 Revision 1.

Resolution

Not incorporated.

Regulatory Guide 1.193 provides a list of those portions of the ASME Code which the NRC staff has found, in its assessment, to be unacceptable. Applicants and/or licensees must be aware of NRC regulatory conditions with respect to the various ASME Code Editions, Addenda, and Code Cases.

Applicants and licensees are always free to propose alternatives to the ASME Code, etc. for specific instances. Proposed alternatives should provide an equivalent level of quality and safety.

The regulatory process provides opportunity for review of a proposed design, prior to fabrication, thus allowing for consideration of proposed alternatives or unique cases before commitments are made.

In the case of N-595, the staff considers that use of the Code Case does not provide the same level of inspection that other welds in the confinement boundary receive, hence its prohibition.

Commentor 2

Comment No. 2.1

The cover letter {for the draft revision to ISG-18} indicates that this revision removes all references to transportation casks because containment boundaries of transportation casks are

not presently constructed with welded lids.....nor are any such expected in the future. However, {the commentor} intends to propose a transportation package which will rely on double containment to prevent leakage. This double containment will consist of a welded inner canister containing spent fuel that will be placed inside a transportation cask. As such, it is appropriate to retain staff guidance for closure welds to be credited as leaktight during transportation. Hence it is recommended that lines 7 and 8 of the draft be revised as shown to broaden the scope and that the applicable content of the ISG be expanded accordingly:

> "Issue: The Design and Testing of Lid Welds on Austenitic Stainless Steel Canisters as the Confinement Boundary for Spent Fuel Storage *or as a Redundant containment Boundary for Transportation"*

Resolution

Not incorporated.

The staff agrees that consistency between the storage and transportation regulations is desirable. However, the staff declines to incorporate a discussion regarding transportation into this revision. The lid designs addressed by the draft guidance are approved lid designs which satisfy the design requirements for storage-only conditions. The staff has not examined whether these same lid designs would be adequate under the loadings that would result from the design accident conditions of transportation. Generally, Part 72 confinement boundaries have not been analyzed (or credited) for conformance with Part 71 performance requirements. Hence, extension of the guidance for Part 72 lid closures to Part 71 is inappropriate absent design-specific details and analyses. The staff has removed the statement that implies none are expected in future, and would review any such future design application, as appropriate.

Commentor 3

<u>Comment No. 3.1</u>

Line 242 (page 6) should be modified by inserting the parenthetical phrase "(either individually or as part of the inner closure)" between the word 'tested' and 'regardless' such that the complete sentence would read as follows:

> Since the weld may potentially be pressurized from underneath due to assumed leakage through the closure valve, it must be helium leakage tested (either individually or as part of the inner closure) regardless of weld size (thickness).

Resolution:

This sentence was edited for clarity. (See Comment 1.7)