

RAI M-1 Weld procedure qualification records: The weld procedure specifications (WPSs) were provided in Enclosures 2 and 3 of the RAI response dated April 5, 2018. The weld procedure qualification record (PQR) was provided in Enclosure 4 of the RAI response dated April 5, 2018. The WPS in Enclosure 2 is SS-8-M-TM Revision 10 (machine-cold wire) which references PQR-1, Rev. 2 provided in Enclosure 4. The WPS in Enclosure 3 is SS-8-A-TN Revision 8 (Manual) which also references PQR-1, Rev. 2 provided in Enclosure 4. However, Enclosure 4, which contains PQR-1 Rev. 2, states that the PQR supports WPS SS-8-M for GTAW and SS-8-C for SMAW. PQR-1 Rev. 2 does not indicate that is PQR supports WPS SS-8-A provided in Enclosure 3.

Please clarify the inconsistency in the response provided to RAI M-1 as noted in the above observations.

RAI M-3 ITCP weld deposit thickness: The RAI response states:

NSPM determined there is a reasonable expectation that the ITCP welds for DSCs 11-15 have an actual thickness of 0.25" because the weld groove height is 0.25", the confirmation from the as-measured data from DSC 16 PAUT, the consistency resulting from the adherence to the qualified weld procedure and techniques, a limited set of qualified welders using the same GTAW machine while implementing a controlled fit-up for the small weld groove volume, and maintenance of a consistent weld deposition rate. These considerations are supported by the PAUT measurements and assessment provided by the SIA chief welding engineer VID review of the DSCs 13 and 16 ITCP welds.

This determination is not supported by an actual measurement. It is noted that in response to RAIs, the applicant included Enclosure 6 Procedure 12751-MNGP-OPS-01, Revision 0, Spent Fuel Cask Welding: 61BT/BTH NUHOMS Canisters (RAI response dated April 5, 2018). The referenced procedure only required weld depth measurements of the OTCP weld (Weld 4). No measurements of the ITCP were required but Procedure 12751-MNGP-OPS-01, Revision 0, does include a note at the end of Section 8.4 indicating that the reinforcement criterion for Weld 1 (the ITCP weld) is exceeded, the OTCP may not fit properly. The only weld head video of an ICTP weld other than DSC-16 is DSC-13. The observation from the video of DSC-13 may support an ITCP weld that has a thickness greater than the 61BTH design but an actual measurement of the ITCP weld thickness is not possible from the weld head video.

Please clarify how your response answers RAI M-3.

RAI M-4 Reports and welding data sheets: The response to RAI-4 dated April 5, 2018 includes Enclosure 6 Procedure 12751-MNGP-OPS-01, Revision 0, Spent Fuel Cask Welding: 61BT/BTH NUHOMS Canisters. Procedure 12751-MNGP-OPS-01 Section 8.10 Repair of Weld Metal and HAZ Defects Post NDE states that there are two types of weld repairs, minor and major. Minor weld repairs to surface discontinuities (such as surface porosity, arc strikes, surface inclusions, improper profile, slight undercut, etc.) are addressed in Procedure 12751-MNGP-OPS-01, Section 8.10.2. Major repairs such as lack of fusion, cracks, bum through, inclusions, crater cracks, excessive root concavity, excessive undercut, excessive root

reinforcement, unconsumed insert, and lack of penetration are addressed in Procedure 12751-MNGP-OPS-01, Section 8.10.3. For both major and minor repairs, NDE (including VT and PT) are required, and are required to be documented in Procedure 12751-MNGP-OPS-01, Attachment 9.3 for minor repairs, and Attachment 9.5 for major repairs.

The DSC 11-15 Exemption request dated October 18, 2017, included Enclosure 3, Structural Integrity Associates, Inc. Report 700388.401, Revision 1, Evaluation of The Welds on DSC 11-15. Appendix C of Enclosure 3 is the Tabulated Review of Available VIDS for Monticello DSC-12 Thru DSC-16. Appendix D of Enclosure 3 has the general area video summary for the DSC welding for DSC-11 through DSC-16. For DSC-11 through DSC-14 grinding was noted on welds in the review of weld head videos and general area videos. It is not clear if the grinding performed was conducted in accordance with Procedure 12751-MNGP-OPS-01, Section 8.8: Rework of In-process Welds, Section 8.9: Weld and HAZ conditions Prior to NDE, Section 8.10: Repair of Weld Metal and HAZ Defects Post NDE, or a combination of rework, conditioning and repairs. In each of the following cases, identification of the applicable section(s) of Procedure 12751-MNGP-OPS-01, Revision 0, Spent Fuel Cask Welding: 61BT/BTH NUHOMS Canisters, is necessary.

1. DSC 11-15 Exemption request dated October 18, 2017, Enclosure 3, Appendix C, page C-3 describes the welding of the OTCP weld of DSC-12 where there appear to be 2 instances of weld root burn-through on layer 2a and 2c (described as a blow through or a blow hole). In accordance with in Procedure 12751-MNGP-OPS-01, Section 8.10.3, these appear to be defects requiring major repair but the RAI response dated April 5, 2018, Enclosure 10, Welding Data Sheets and Inspection Records for the Closure Welds on DSCs 11-16 contains no documentation of any minor or major repairs on DSC-12.
2. DSC 11-15 Exemption request dated October 18, 2017, Enclosure 3, Appendix C, pages C-4 and C-5 describes the welding of the OTCP weld of DSC-13 where there appear to be two instances of grinding documented associated with layer 2 and layer 4. No minor repair documentation was provided for DSC-13. It is not clear if the grinding identified in the summary qualifies as a minor repair described in Procedure 12751-MNGP-OPS-01, Section 8.10.2.
3. DSC 11-15 Exemption request dated October 18, 2017, Enclosure 3, Appendix C, page C-6 indicates grinding on layer 5a of the OTCP weld of DSC-14. No minor repair documentation was provided for DSC-14. It is not clear if the grinding identified in the summary qualifies as a minor repair described in Procedure 12751-MNGP-OPS-01, Section 8.10.2.
4. DSC 11-15 Exemption request dated October 18, 2017, Enclosure 3, Appendix D, page D-4 identifies grinding for all ITCP and OTCP welds on DSC-11. No major or minor repair documentation was provided for DSC-11. It is not clear if the grinding identified in the summary in Appendix D qualifies as a major or minor repair described in Procedure 12751-MNGP-OPS-01, Section 8.10.

Clarifications, as identified above, are needed to complete evaluation of RAI M-4 response.

RAI M-5 Weld head videos and general area video differences: The response to RAI M-5, page 8 of 14 states: *In some cases, periodic grinding was apparent and in other cases, local weld repairs were observed.* As previously stated, the RAI response dated April 5, 2018, Enclosure 10, Welding Data Sheets and Inspection Records for the Closure Welds on DSCs 11-16, contains no documentation of any minor or major repairs on any of the DSCs 11-16. It is unclear if the local weld repairs referred to in this statement should have been documented in additional Attachment 9.3 forms (minor repairs) or Attachment 9.5 forms (major repairs).

Please clarify RAI M-5 response related to the discussion of RAI M-4 above and specifically describe the local weld repairs for each DSC loaded in this campaign.

RAI M-6 Assumed flaw size in the ITCP weld: The applicant's response to RAIs dated April 5, 2018, included Enclosure 8, Structural Integrity Associates, Inc. Report 130415.403, Revision 2, Assessment of Monticello Spent Fuel Canister Closure Plate Welds Based on Welding Video Records. This report includes the SIA review of available weld head videos. The only weld head videos of the ITCP welds are for DSCs 13 and 16. The PAUT of DSC-16 showed intermittent lack of fusion defects that were conservatively modeled as full circumferential defects.

The staff notes that there are differences in the assessment of the ITCP weld comments included in the Exemption request dated October 18, 2017, Enclosure 3, Appendix C, page C-5 with the description provided in RAI response dated April 5, 2018, Enclosure 8, Structural Integrity Associates, Inc. Report 130415.403, Revision 2, Assessment of Monticello Spent Fuel Canister Closure Plate Welds Based on Welding Video Records Section 5.7. DSC 11-15 Exemption request dated October 18, 2017, Enclosure 3, Appendix C, page C-5 includes a summary of the ITCP weld of DSC-13. Specifically, Appendix C, page C-5 describes the weld pool as lava-like from side to side and extended ahead of the tungsten electrode on the lid side. Drifting of the tungsten electrode is also noted. Lack of fusion defects would appear to be more likely under these conditions. The description on page C-5 does not appear to be consistent with the description provided in the RAI response dated April 5, 2018, Enclosure 8, Structural Integrity Associates, Inc. Report 130415.403, Revision 2, Assessment of Monticello Spent Fuel Canister Closure Plate Welds Based on Welding Video Records, Section 5.7, which only notes observations of good welding practices and did not identify weld conditions that may require mitigating action(s).

Please clarify the differences in the assessment of the ITCP weld comments, as noted above.

RAI M-6 Assumed flaw size in the ITCP weld continued: The General Area video provided in the exemption request dated October 18, 2017, Enclosure 3, Structural Integrity Associates, Inc. Report 700388.401, Revision 1, Evaluation of The Welds on DSC 11-15, Appendix D, provides some additional insight into the ITCP welds for the loading campaign. The following observations are noted from the summary in Appendix D:

1. DSC-11, the first DSC loading in this campaign, had multiple stops and restarts as well as corrective actions including grinding for both ITCP weld passes. No repair were

identified in Enclosure 10 Welding Data Sheets and Inspection Records for the Closure Welds on DSCs 11-16 provided in the RAI response dated April 5, 2018.

2. DSC-12 has no weld head video or general area video of the ITCP weld. No repair were identified in Enclosure 10 Welding Data Sheets and Inspection Records for the Closure Welds on DSCs 11-16 provided in the RAI response dated April 5, 2018.

Please clarify how the limited available information on DSCs 11 and 12 support the assumed flaw size based on the PAUT results obtained for DSC-16.