

Non-proprietary Request for Additional Information
NAC International
Docket No. 71-9225
Certificate of Compliance No. 9225
Model No. NAC-LWT Package

By application dated December 28, 2012, as supplemented on March 14, 2013, and March 5, and July 16, 2014, NAC International (NAC) requested an amendment to Certificate of Compliance No. 9225 for the Model No. NAC-LWT package. The applicant requested that the certificate be revised to add high enriched uranyl nitrate liquid (HEUNL) as authorized contents. This request for additional information identifies information needed by the U.S. Nuclear Regulatory Commission staff in connection with its review of the application. The requested information is listed by chapter number and title in the applicant's safety analysis report (SAR). NUREG-1609, "Standard Review Plan for Transportation Packages for Radioactive Materials," was used by the staff in its review of the application.

Each question describes information needed by the staff for it to complete its review of the application and to determine whether the applicant has demonstrated compliance with regulatory requirements.

Chapter 1 – General Information Evaluation

1. See Enclosure 1.
2. Revise the SAR to address the following regarding the Type I and Type II HEUNL containers:
 - a. Clarify whether the Type I HEUNL container design will be used for vertical draining only, and whether the Type II HEUNL container design will be used for vertical or horizontal draining. In addition, describe any other reasons for using a Type I or Type II HEUNL container.
 - b. Address the potential confusion regarding note 4 in association with item 25, both of which appear on Drawing No. 315-40-181, Rev. 3P considering the need for complete removal of contents and accountability of the fissile contents.

If the Type II HEUNL container is drained in the horizontal orientation, it appears the vent tube (item 25 from Drawing No. 315-40-181, Rev. 3P) is used for draining instead of the drain tube (item 15 from Drawing No. 315-40-181, Rev. 3P) (i.e. the HEUNL liquid will come out of the vent tube when the HEUNL container and vent tube are in the proper orientation.) Note that means for the Type II HEUNL container, the vent tube (item 25 from Drawing No. 315-40-181, Rev. 3P) should have the stamp/engraving "Drain/fill" as described in note 4 from Drawing No. 315-40-181, Rev. 3P, or more accurately the stamp/engraving "Drain." This could result in incorrect stamping/engraving and potentially incomplete removal of contents, or incorrect accountability of contents. It may not be the intention to "Fill" through the vent tube because the tube doesn't reach the bottom of the HEUNL container during the required vertical filling operations. For example, Section 7.1.14.2 step 3 of the application may not be accurate for the Type II HEUNL container. If this is not correct, provide further explanation how the Type II HEUNL container will be completely drained in the horizontal orientation.

This information is needed to determine compliance with Title 10, *Code of Federal Regulations* (10 CFR) 10 CFR 71.33.

Chapter 4 – Containment Evaluation

All questions are proprietary.

Chapter 7 – Operating Procedures Evaluation

1. Clarify the acceptance criteria when leak testing the HEUNL lid plug and HEUNL closure lid O-ring seals to ensure HEUNL containment after filling.

SAR Section 7.1.14.2 steps 7.i and 9.d (page 7.1-66), indicate a leakage rate sensitivity of 1×10^{-3} ref-cm³/s, per American National Standards Institute (ANSI) in ANSI N14.5-1997, "Radioactive Materials - Leakage Tests on Packages for Shipment." According to ANSI N14.5-1997, the acceptance criteria for a preshipment leakage rate test is either "a leakage rate of not more than the reference air leakage rate" or "no detected leakage when tested to a sensitivity of at least 1×10^{-3} ref-cm³/sec." As currently written in Section 7.1.14.2 of the SAR, it appears that the HEUNL lid plug and O-ring seal leakage test procedures accept a certain amount of leakage.

This information is needed to determine compliance with 10 CFR 71.33, and 10 CFR 71.87.

2. Clarify whether Section 7.1.14.2 of the SAR addresses that the functional leakage rate test ensures there is no leakage of air from the valved nipple(s) and container interface, and the vent tube or siphon tube to the HEUNL container's top end cap interface.

The focus of the NAC response dated July 16, 2014, (see ADAMS Accession No. ML14203A315) to NRC's question No. 7.4 (in letter dated June 3, 2014 (see ADAMS Accession No. ML14155A016) was on the quick disconnect valve, and it is not clear whether the functional leakage rate test of this component also tests the integrity of the vent tube or siphon tube interface with the HEUNL container's top end cap. In order to ensure that an under fill void volume of at least 1 gallon based on the length of the siphon assembly and vent tube, there cannot be leakage of air from the HEUNL container during filling operations. That also means there cannot be leakage from the valved nipple(s) and container interface, or the vent tube or siphon tube to the HEUNL container's top end cap interface. It is not clear whether the test described in Section 7.1.14.2.5 of the application captures those multiple interfaces.

This information is needed to determine compliance with 10 CFR 71.87.

Chapter 8 – Acceptance and Maintenance Tests Evaluation

1. Justify the use of personnel certified by American Society of Nondestructive Testing (ASNT) as a Level II examiner to develop and approve helium and pressure change leakage rate testing procedures considering that industry standards indicate that this should be performed by a Level III examiner.

Both the NAC's response dated July 16, 2014 (see ADAMS Accession No. ML14203A315), to NRC's question No. RAI 4.1 in letter dated June 3, 2014 (see ADAMS Accession No. ML14155A016), and SAR Section 8.1.4.4 indicate that leak test procedures would be prepared and approved by an ASNT Level II examiner. However, the ANSI/ASNT CP-189-2006, "Standard for Qualification and Certification of Nondestructive Testing Personnel", which provides the minimum training, education, and experience requirements for nondestructive testing personnel, states that a nondestructive testing personnel Level III examiner has the qualifications to develop and approve written instruction for conducting the leak testing.

This information is needed to determine compliance with 10 CFR 71.37, 10 CFR 71.87, and 10 CFR 71.119.

2. Revise the verification test in Section 8.1.4.4.B "Pressure Testing" which ensures the under filled void volume is at least 1 gallon by:
 - a. describing the siphon assembly item 26 in drawing 315-40-181, Rev. 3P, and providing Drawing No. 315-40-181-94.
 - b. addressing that this verification test is applicable to the Type II container vent tube (item 25 from Drawing No. 315-40-181, Rev. 3P), as well as the Type I container siphon assembly (item 26 from Drawing No. 315-40-181, Rev. 3P),
 - c. addressing that this verification test must be performed with the HEUNL container in the vertical orientation,
 - d. clarifying the procedure regarding, "the drain tube and siphon assembly are installed,"
 - e. including steps to verify the drain tube was not tested in place of the vent tube or siphon tube.

Drawing No. 315-40-181-94 was not provided. This verification test description only addresses the siphon assembly for the Type I container, it does not address that the verification test is also applicable to the vent tube for the Type II container. For verification of the under filled void volume of at least 1 gallon based on the length of the siphon assembly and vent tube, the HEUNL container must be in the vertical orientation, as it must be during filling operations. It is not clear whether the drain tube, siphon assembly (and vent tube that was not addressed), are installed prior to the hydrostatic test or after the hydrostatic test. If the tubes are installed after the hydrostatic test, details should be provided to clarify how this is performed considering the geometry (straight, or with bends) of the tubes. Although the drain tube is described to be closed in the Section 8.1.4.4.B procedures, a separate RAI (see item 2 in Chapter 1 – General Information Evaluation, above) noted how mislabeling of the drain or vent could occur. Because the container will have to be completely drained, it may be beneficial to include steps in the procedure that describes completely draining the HEUNL container. This could also verify the wrong tube (drain instead of vent or siphon) was not initially tested.

This information is needed to determine compliance with 10 CFR 71.33(b)(2), and 71.87(d).

3. Revise Section 8.1.4.4.B, "Pressure Testing" of the SAR to:
 - a. Address whether the siphon assembly for the Type I HEUNL container and vent tube for the Type II HEUNL container is installed prior to the hydrostatic test. If these parts are installed prior to the hydrostatic test, revise the section to:

- i. address how it is possible to perform a hydrostatic test which necessitates completely filling the container, including how air is let out of the HEUNL container, and
 - ii. describe steps in Section 7.1.14.2 of the operating procedures to prevent the complete filling of the HEUNL container.
- b. Describe hydrostatic pressure testing of the lid plug and the associated O-ring seal.

If the vent tube or siphon assembly is installed prior to the hydrostatic test, it should not be possible to completely fill the HEUNL container to perform the hydrostatic test, because that is the purpose of the minimum dimensioned length in Note 11 of Drawing No. 315-40-181, Rev. 3P. It is also not clear how air is let out of the HEUNL container to allow complete filling of the HEUNL container, if the vent tube or siphon assembly is installed prior to the hydrostatic test. If the vent tube or siphon assembly is installed prior to the hydrostatic test, it should be completely described in Section 7.1.14.2 of the operating procedures how any steps that are taken to completely fill the HEUNL container during the hydrostatic test are prevented during the filling operations.

The lid plug and associated O-ring seal are part of the pressure boundary as described in Section 8.1.4.4.B of the SAR. Section 8.1.4.4.B states, "The pressure test system will be installed in the container lid plug hole to allow container filling, venting and application of the hydrostatic pressure." It is not clear how the lid plug and associated O-ring seal are being pressure tested in this section of the SAR.

This information is needed to determine compliance with 10 CFR 71.33, 10 CFR 71.43(f), and 10 CFR 71.51.

4. Clarify how a straight section drain line (e.g. lance) of a diameter which can be inserted through the vent port could be used with the item 25 vent tube from Drawing No. 315-40-181, Rev. 3P.

It is not clear how a straight section drain line (e.g. lance) could be used to drain the Type II HEUNL container for the Type II container considering the bends in the item 25 vent tube from Drawing No. 315-40-181, Rev. 3P.

This information is needed to determine compliance with 10 CFR 71.43(f).