

October 12, 2018

Atlanta Corporate Headquarters
3930 East Jones Bridge Road, Suite 200
Norcross, GA 30092
Phone 770-447-1144
Fax 770-447-1797
www.nacintl.com

U.S. Nuclear Regulatory Commission
11555 Rockville Pike
Rockville, MD 20852-2738

Attn: Document Control Desk

Subject: Submission of Replacement Pages for NAC-STC Submittal 18B, Responses to the NRC Request for Additional Information for NAC's Request for a Revision to Certificate of Compliance (CoC) No. 9235

Docket No. 71-9235

- References:
1. Model No. NAC-STC Package, U.S. Nuclear Regulatory Commission (NRC) Certificate of Compliance (CoC) No. 9235, Revision 17, April 6, 2017
 2. Safety Analysis Report (SAR) for the NAC Storage Transport Cask (NAC-STC), Revision 17, NAC International, April 2011
 3. NUREG-1617, Standard Review Plan for Transportation Packages for Spent Nuclear Fuel, March 2000
 4. NUREG/CR-3854, Fabrication Criteria for Shipping Containers, March 1985
 5. ED20170024, Request for a Revision to Certificate of Compliance (CoC) No. 9235 for the NAC-STC Cask Gamma Scanning Requirements, March 16, 2017
 6. NRC Letter, Application for the Model No. NAC-STC – First Request for Additional Information, June 16, 2017
 7. ED20170026, Submission of Responses to the NRC Request for Additional Information for NAC's Request for a Revision to Certificate of Compliance (CoC) No. 9235 for the NAC-STC (Submittal 17B), July 17, 2017
 8. ED20170092, NAC's Request for a Revision to Certificate of Compliance (CoC) No. 9235 for the NAC-STC (Submittal 17C), September 20, 2017
 9. NRC Letter, Application for the Model No. NAC-STC- Request for Additional Information, February 8, 2018
 10. ED20180025, NAC's Request for a Revision to Certificate of Compliance (CoC) No. 9235 for the NAC-STC (Submittal 18A), March 6, 2018
 11. ED20180063, Submission of Responses to the NRC Request for Additional Information for NAC's Request for a Revision to Certificate of Compliance (CoC) No. 9235 for the NAC-STC (Submittal 18B), July 18, 2018
 12. ED20180086, Submission of Replacement Pages for NAC-STC Submittal 18B, Responses to the NRC Request for Additional Information for NAC's Request for a Revision to Certificate of Compliance (CoC) No. 9235, September 19, 2018

NAC International (NAC) hereby submits replacement pages for the response to the Request for Additional Information (RAI) provided to the NRC on July 18, 2018 (Reference 11). Editorial errors affected the second paragraph of SAR Section 8.1.4.3, page 8.1-11 (backing page included). These editorial errors affect both the proprietary and non-proprietary versions of the submittal. The replacement pages for the proprietary submittal are provided in Attachment 1 and the replacement pages for the non-proprietary submittal are provided in Attachment 2 to this letter.

U.S. Nuclear Regulatory Commission
October 12, 2018
Page 2 of 2

This submittal package contains one hard copy of both the proprietary and non-proprietary versions, which includes the STC-18B replacement pages to Reference 11. The replacement pages to proprietary version of this submittal do not contain proprietary information therefore an Affidavit pursuant to 10 CFR 2.390 is not needed for this submittal.

Consistent with NAC administrative practice, this proposed SAR revision is numbered to uniquely identify the applicable changed pages. Revision bars mark the SAR text changes on the Revision STC-18B pages. In accordance with NAC's administrative practices, upon final acceptance of this application, the STC-18B changed pages will be reformatted and incorporated into the next revision of the NAC-STC SAR. If you have any comments or questions, please contact me on my direct line at 678-328-1236.

Sincerely,



Wren Fowler
Director, Licensing
Engineering

Attachments:

- Attachment 1 – NAC-STC, SAR 18B Replacement Pages (Proprietary Version)
- Attachment 2 – NAC-STC, SAR 18B Replacement Pages (Non-Proprietary Version)

Attachment 2

**NAC-STC, SAR 18B
Replacement Pages
(Non-Proprietary Version)**

8.1.4.3 Miscellaneous

The removable transport impact limiters consist of redwood and balsa wood. License drawings and the supporting analyses specify the crush strengths of the redwood and balsa wood to be 6240 psi \pm 620 psi and 1550 psi \pm 150 psi respectively. For manufacturing purposes, verification of the impact limiter material is accomplished by verifying the densities of the wood. Three samples from each redwood board are to be tested for density, and the average density of the samples shall be 23.5 \pm 3.5 pounds/cubic foot. Each 15-degree and 30-degree pie shaped section of the impact limiter shall have a density of 22.3 \pm 1.2 pounds/cubic foot in accordance with the License Drawings. The moisture content for any single redwood board must be greater than 5 percent, but less than 15 percent. The average moisture content for a lot of redwood used in impact limiter construction must not be greater than 12 percent.

Following final closure welding of the transport impact limiter stainless steel shell, a test of the shell welds shall be performed to verify weld integrity. The following are acceptable methods, which may be selected from to verify weld integrity:

1. A test may be performed by evacuating the impact limiter to 75 mbar and performing a 30-minute test to determine if there is any increase in the impact limiter pressure. Any detected leak shall not exceed 1×10^{-2} cm³/sec. If a leak exceeding this value is detected, the cause of the leak shall be determined, and the weld repaired and retested.
2. A positive pressure leak test may be performed on each impact limiter to ensure the leak tightness of the impact limiter shell welds. Remove the test plug and install the necessary piping to convey oil-free air or gas to the inside of the impact limiter shell. Apply an air or gas pressure to the inside of the impact limiter shell to initiate the test. Allow the system to stabilize for at least 15 minutes. Spray all the outside welds with foaming bubble solution. Examine the limiter welds for indications of continuous bubble formation. All leaks detected shall be repaired and the leak test re-performed until there are no leak indications. Upon the completion of leak testing, the test plug shall be reinstalled.
3. After final closure welding of the transport impact limiter stainless steel shells, a PT examination may be performed on all shell welds to verify weld integrity. Liquid penetrant examined per ASME B&PV Section V, Article 6. Acceptance per Section III, Article NF-5350.

8.1.5 Tests for Shielding Integrity

8.1.5.1 Gamma Shield Test

The gamma scan test shall be conducted by continuous scanning or probing over 100 percent of all accessible cask body surfaces, which directly shield regions where lead was poured, using a detector and a ^{60}Co source. Accessible cask surfaces are not only those surfaces that are physically accessible but also cask surfaces where accurate detector readings can occur. The source strength shall be of an intensity sufficient to produce a count rate that equals or exceeds three times the background count rate on the external surfaces of the cask. The count rate shall be maintained for greater than one minute prior to the start of scanning. The detector scan path spacing (cask body exterior surface) will be sufficiently small such that there will be scanning overlap based on the size detector used and the scanning speed will be 4.5 feet per minute or less. The source scan path spacing (cask interior surface) will be on a sized grid pattern that is sufficiently small such that scanning overlap will occur based on the size detector used.

A gamma scan test is not required for the cask inner closure lid, cask outer closure lid, cask inner bottom forging, cask outer bottom forging, or cask outer bottom plate. These components shall be ultrasonic tested in order to demonstrate their soundness as gamma shielding. Ultrasonic testing shall be performed per ASME B&PV NB-2542.1 using the acceptance standards of Section NB-2542.2 for forgings and ASME B&PV NB-2532.1 using the acceptance standards of NB-2532.1(b) for plates.

The acceptance criteria for the cask body shield test shall be that the shield effectiveness of the cask body is equal to or greater than the shield effectiveness of a lead and steel mock-up. The steel thickness of the mockup shall be equivalent to the minimum steel thickness specified on the License Drawings and the lead thickness shall be equivalent to the minimum lead thickness specified in the License Drawings less 3 percent. The shielding mock-up will be produced using the same fabrication techniques as those approved for the cask.

Measured count rates that exceed those established by the test mock-up shall cause the component to be rejected. The rejected areas/components shall be evaluated to determine the corrective action to be taken. Any repaired areas shall be retested prior to acceptance.