

November 22, 2004

Mr. Thomas C. Thompson
Licensing Manager
NAC International, Inc.
3930 East Jones Bridge Road
Norcross, GA 30092

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF
PROPOSED AMENDMENT NO. 4 TO THE NAC-UMS UNIVERSAL STORAGE
SYSTEM (TAC NO. L23760)

Dear Mr. Thompson:

By letter dated August 10, 2004, NAC International (NAC) submitted an amendment request to the U. S. Nuclear Regulatory Commission (NRC) for Certificate of Compliance (CoC) No. 1015. This amendment application proposes incorporating changes to facilitate operations, provide greater operational flexibility, and reduce personnel exposure consistent with ALARA practices. On September 29, 2004, you were notified that the NRC staff had completed its acknowledgment review of your application and that your application contained sufficient information for the staff to begin its detailed technical review. We also provided a proposed schedule for completing the technical review of your application.

The staff has determined that further information is needed to complete its technical review. The information requested is listed in the enclosure. Your response should be provided by January 19, 2005. If you are unable to meet this deadline, you must notify us in writing, at least two weeks in advance, of your new submittal date and the reasons for the delay. The staff will then assess the impact of the new submittal date and notify you of a revised schedule.

Please reference Docket No. 72-1015 and TAC No. L23760 in future correspondence related to this licensing action. If you have any questions, please contact me at (301) 415-1396.

Sincerely,

/RA/

L. Raynard Wharton, Project Manager
Licensing Section
Spent Fuel Project Office
Office of Nuclear Material Safety
and Safeguards

Docket No. 72-1015

Enclosure: Request for Additional Information

Mr. Thomas C. Thompson
 Licensing Manager
 NAC International, Inc.
 3930 East Jones Bridge Road
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NAC INTERNATIONAL

DOCKET NO. 72-1015

REQUEST FOR ADDITIONAL INFORMATION

RELATED TO THE NAC-UMS SYSTEM AMENDMENT NO. 4

By application dated August 10, 2004, NAC International (NAC) requested approval of an amendment to Certificate of Compliance (CoC) No. 1015. The proposed amendment revises the NAC-UMS technical specifications (TS) and CoC to incorporate changes based on user experience and lessons learned. The changes facilitate operations, provide greater operational flexibility, and reduce personnel exposure.

This request for additional information (RAI) identifies additional information needed by the U.S. Nuclear Regulatory Commission (NRC) staff in connection with its review of the amendment. The requested information is listed by chapter number and title in the applicant's Safety Analysis Report (SAR). NUREG -1536, "Standard Review Plan for Dry Cask Storage Systems," was used by the staff in its review of the amendment application.

Each individual RAI section describes information needed by the staff to complete its review of the application and the SAR and to determine whether the applicant has demonstrated compliance with the regulatory requirements.

Chapter 3.0 Structural Evaluation

3-1 Reinstatement of TS paragraph B 3.4.1.3, that was approved in Amendment No. 3 of CoC No. 1015. This TS on the design basis earthquake and coefficient of friction (COF) site parameters requires verification by the NAC-UMS System user. Higher seismic acceleration levels and lower COF values, which may cause the Vertical Concrete Cask (VCC) to slide, may be acceptable provided they are properly justified in the SAR. Alternatively, if the COF requirement is deleted, as proposed, to allow VCC sliding during earthquakes, relevant VCC structural performance criteria must be defined to address the effects of earthquakes.

The current site parameters in TS B 3.4.1.3 establish the VCC seismic stability performance criteria against sliding. Absent these requirements, VCC sliding could potentially result in an unanalyzed condition, such as VCC collision and falling off the edge of an ISFSI pad during an earthquake. Reinstating the peak earthquake acceleration requirement provides the design basis for which the VCC structural performance can be addressed as required in 10 CFR 72.122(b)(2)(i), which states, "Structures, systems, and components important to safety must be designed to withstand the effects of...earthquakes..."

If the COF site parameter requirement is removed, an earthquake with sufficiently high peak acceleration, may potentially cause VCCs to collide with each other or fall off the edge of an ISFSI pad. NUREG-1536, page 3-14, states, "The applicant should demonstrate that no tipover or drop will result from an earthquake. In addition, impacts between casks should either be precluded, or should be considered an accident event for which the cask must be shown to be structurally adequate." On this basis, relevant structural performance criteria such as those for limiting the VCC lateral displacement

and impact velocity must be defined in Technical Specifications to evaluate the effects of earthquakes on the NAC-UMS System.

This information is requested in accordance with the provisions of 10 CFR 72.236(b).

- 3-2 Provide a SAR evaluation of the design basis earthquake level and corresponding VCC performance criteria, for limiting the VCC lateral displacement and impact velocity to justify the SAR assertion, "...no safety concern if the designed pad coefficient of friction is reduced for any reason."

Sufficient evaluation must be presented to support the SAR assertion and the proposed revision of TS 3.4.1. This information is requested in accordance with the provisions of 10 CFR 72.236(b).

Chapter 4. 0 Thermal Evaluation

- 4-1 State in TS LCO 3.1.2 and SAR Section 8.1.1 that the vacuum pump is not running during the 10 minute period when the pressure in the canister is being observed to be equal to or less than 10 mm Hg. Also, correct the acceptance criteria to read "with no pressure rise during the 10-minute period" rather than "with pressure remaining #10 mm of mercury during the 10-minute period."

LCO 3.1.2 and SAR Section 8.1.1 (Steps 30 and 31) do not explicitly state that the vacuum pump is to be turned off when performing the canister vacuum pressure rise check. There is also no definitive acceptance criteria established once the desired vacuum pressure is reached. For example, it would be possible to lower the vacuum to 5 mm of Hg, let it rise to 9 mm of Hg and still meet the proposed criteria of being #10 mm Hg.

The following wording is an alternative to that proposed in the TS and SAR:

LCO 3.1.2- The CANISTER vacuum drying pressure shall be #10 mm of Hg. Vacuum pressure shall be held for a minimum of 10 minutes with the pump shut off with no increase in pressure during the 10 minute period.

Step 30- Operate vacuum equipment until a vacuum of #10 mm of Hg exists in the canister then shut off vacuum equipment.

Step 31- Verify that no water remains in the canister by holding the vacuum of #10 mm of Hg for a minimum of 10 minutes with no pressure increase. If water is present in the cavity, the pressure will rise as the water vaporizes. If pressure rises repeat Step 30 then hold the pressure until the conditions of LCO 3.1.2 are met.

This information is requested in accordance with the provisions of 10 CFR 72.236(f).

- 4-2 Add a precaution in the operating procedures to state what actions need to be taken if the water temperature in the canister is near or below the saturation temperature of water at 10 mm hg which is approximately 52EF (saturation temperature of water associated with 10 mm Hg).

Loading relatively cold fuel in a cold environment may negate the effect of vaporizing the residual water if the temperature is below 52EF. Additionally, there does not appear to be any welding minimum temperature limits that would prohibit the environmental temperature from being below 52EF.

This information is requested in accordance with the provisions of 10 CFR 72.236(f).

- 4-3 Change the definition of “Operable” to include verification of the temperature difference between the air inlet and outlet for each initial canister loading before relying solely on unobstructed screens.

As proposed, the definition of “Operable” can be either the temperature difference between the air inlet and outlet or the verification of unobstructed air inlet and outlet screens. However, the latter does not preclude the possibility of thermally overloading the canister. Therefore, the latter must be preceded by verification that the canister has been loaded within its thermal design basis by measuring the temperature difference between the air inlet and outlet temperatures.

This information is requested in accordance with the provisions of 10 CFR 72.236(f).

- 4-4 Clarify SAR Section 8.1.1, Step 12, to ensure that any cooling of the canister after the drain time limits of Table 8.1.1-3 have been exceeded, is performed with a water filled canister.

The basis for the time limits on in-pool cooling and forced air cooling is documented in NAC Calculation EA790-3206 Rev.5, Appendix G which presumes a water filled canister. This step is meant to include an alternate cooling means when the time limits through Step 28 (draining the canister) are not met, including a partially drained canister. The NAC analysis that provides the basis for this step does not support canisters partially filled with water and gases.

This information is requested in accordance with the provisions of 10 CFR 72.236(f).

- 4-5 Justify how the analysis documented in NAC Calculation EA790-3206 Rev.5, bounds the draining operation described in SAR Section 8.1.1, Step 28, which could include blow-down gas. Also, identify the possible blow-down gases and include the estimated time that the canister would be filled with this gas and any resulting temperature increase. Modify the thermal section of the SAR to reflect this information.

This information is requested in accordance with the provisions of 10 CFR 72.236(f).

- 4-6 Clarify use of the term “start time” for completion of operations through SAR Section 8.1.1, Step 28. There appears to be some inconsistency as to when the “start time” begins. The note at the beginning of Step 12 implies that “start time” is when the top of the transfer cask clears the pool surface. The note at the end of Step 12 indicates that “start time” is when the top of the canister is above the pool water surface (i.e., no longer fully submerged).

This information is requested in accordance with the provisions of 10 CFR 72.236(f).

- 4-7 Explain how the time periods shown in SAR Section 8.1.1, Step 12, were derived from NAC Calculation EA790-3206 Rev. 5.

This information is requested in accordance with the provisions of 10 CFR 72.236(f).