



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

**FINAL SAFETY EVALUATION REPORT
NAC INTERNATIONAL
NAC-UMS STORAGE SYSTEM
DOCKET NO. 72-1015
AMENDMENT NO. 6**

Summary

This safety evaluation report (SER) documents the U.S. Nuclear Regulatory Commission (NRC) staff's review and evaluation of an amendment to Certificate of Compliance (CoC) No. 1015 for the Model No. NAC-UMS spent fuel storage system. By application dated May 23, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17145A380), as supplemented on January 16, 2018 (ADAMS Accession No. ML18018A893), NAC International (NAC or the applicant) submitted a request to the NRC in accordance with Title 10 of the *Code of Federal Regulations* (10 CFR) 72.244 to amend CoC No. 1015. NAC requested the following changes to the technical specifications (TS):

- revise TS No. A.3.1.6 to change condition A from "LCO not met" to read: CONCRETE CASK heat removal system inoperable, and remove required action A.2 (including subsequent renumbering of A.3);
- clarify that the applicability of TS No. A.3.3.2, "Concrete Cask Average Surface Dose Rates" is prior to placement into storage;
- delete TS No. A 5.4, including conforming changes to the SAR; and
- revise the safety analysis report (SAR), Chapter 12, the basis for Limiting Condition for Operation (LCO) C 3.1.6 to provide additional guidance for the intent of "immediate" actions.

In its application, NAC requested deletion of Surveillance Requirement (SR) 3.1.6.2 located in TS A.3.1.6, LCO 3.1.6. Via supplement dated January 16, 2018, NAC withdrew this request.

In support of the amendment, NAC submitted Revision 17A, of the SAR for the NAC-UMS storage system. The NRC staff reviewed the amendment request using guidance in NUREG-1536, "Standard Review Plan for Dry Cask Storage Systems," Rev. 1, dated July 2010. For the reasons stated below, and based on its review of the statements and representations in the application, as supplemented, and the conditions specified in the CoC and TS, the staff concludes that the requested changes meet the requirements of 10 CFR Part 72.

The NRC staff determined that the following areas of review are not affected by this amendment and therefore are not addressed in this SER: general information principle design criteria, confinement, shielding, criticality, materials, operating procedures, acceptance tests and maintenance program, radiation protection, accident analyses, and quality assurance.

3.0 Structural Evaluation

The applicant requested deletion of TS A 5.4. The requirement proposed for deletion states that "The concrete cask and canister shall be inspected if they experience a drop or a tipover."

The NRC reviewed NAC's structural evaluation in Section 11.2.4.3, "Analysis of 24-Inch Cask Drop," (ADAMS Accession No. ML16341B102) of the final safety analysis report (FSAR) along with the table of lifting heights for the concrete cask in Appendix A of the TS, Table A5-1. NAC concluded that a 24-inch cask end drop results in the base weldment, which includes the air inlets, being crushed by approximately 1 inch. The effect of the reduction of the inlet area by the drop is to reduce cooling airflow. Since the only effect of the drop would be a reduction in inlet area air flow, and TS 3.1.6 requires the licensee to ensure that the heat removal system is operable once a day (i.e., sufficient annulus air flow), and there are no design basis accidents that result in the tip-over of the cask, the requirement in TS A 5.4 to inspect the cask and canister if they experience a drop or a tipover is redundant.

F3.1 The staff concludes that the deleted TS, was duplicative with TS 3.1.6 and provides for safe storage of spent fuel in the NAC-UMS storage system. The finding is reached on the basis of a review that considered the regulation itself, appropriate regulatory guides, applicable codes, and accepted engineering practices.

4.0 Thermal Evaluation

4.1 Revision to Limiting Condition for Operation 3.1.6

The TSs for Amendment No. 5 (see ADAMS Accession No. ML090120459) for this CoC states that Condition A for LCO 3.1.6 is "LCO not met," which NAC is changing to "The CONCRETE CASK Heat Removal System shall be OPERABLE" in this amendment. If Condition A is invoked, then the applicant should perform three required actions under Condition A, including required action A.2, "Verify fuel loading meets CoC approved contents requirements." The applicant proposed to revise Condition A to describe the condition as "Concrete Cask heat removal system inoperable," and also proposed to remove Required Action A.2 (including subsequent renumbering of A.3). The applicant states that Required Action A.2 is a redundant requirement to what is already specified in CoC Appendix B, "Approved Contents and Design Features for the NAC-UMS System."

The staff reviewed the application, CoC and applicable TS Appendices A and B and finds that the proposed change will not impact the ability to make the heat removal system operable in Condition A. The change to the description of Condition A from "LCO not met" to "Concrete heat removal system is inoperable" is a clarifying, editorial change that does not change the substantive requirements for what must be done when the heat removal system is inoperable. Staff also finds that Required Action A.2 is redundant in requiring the applicant to verify fuel loading meets the approved contents requirements since the applicant must meet the fuel specifications given in Appendix B per the CoC and NRC regulations. Therefore, the staff concludes that the revision of Condition A, removal of Required Action A.2 and subsequent renumbering of Required Action A.3 is acceptable.

4.2 Deletion of Technical Specification A 5.4

The current CoC TS includes Section A 5.4 which describes surveillance in response to off-normal, accident or natural phenomena events. The current TS states the ISFSI shall be inspected within 4 hours after the occurrence of the event and that this inspection must specifically verify that all the concrete cask inlets and outlets are not blocked or obstructed. The current TS also specifies that at least one-half of the inlets and outlets on each concrete cask must be cleared of blockage or debris within 24 hours to restore air circulation. The applicant has proposed to delete TS A 5.4 based on the fact that it is an unnecessary surveillance since,

according to the applicant, it is, in principle, covered by existing LCO 3.1.6 surveillance requirements and frequencies.

The staff reviewed the application and the applicable LCO 3.1.6 and its SR 3.1.6.1. LCO 3.1.6 applicability is "During Storage Operations" (regardless of normal, off-normal, accident or natural phenomena events) and SR 3.1.6.1 requires either temperature measurements or visual verification that all four air inlet and outlet screens are unobstructed every 24 hours. The staff finds that SR 3.1.6.1 is applicable under any condition and is required to be completed every 24 hours. If the heat removal system is inoperable, the licensee must immediately remediate the blocked vents to ensure adequate heat removal to prevent exceeding short-term temperature limits. If the short-term temperature limits are not exceeded then restoring the heat removal capability within 25 days will ensure that the long-term temperature limits are not exceeded, which covers the requirement of Section A 5.4. Therefore, the staff concludes that the proposed change to delete Section A 5.4 is acceptable and will have no impact on the thermal evaluation and safe storage of the cask.

4.3 Revise FSAR Chapter 12, Limiting Condition for Operation Bases 3.1.6 to provide additional guidance for the intent of "immediate" actions.

Currently, FSAR Chapter 12, LCO Bases 3.1.6 defines "immediate" action in regards to restoring the heat removal capabilities of the concrete cask as "typically, one operating shift." The applicant proposed to revise this section to provide additional guidance for the intent of "immediate" action to mean "within the design-basis time limit as presented in Section 11.2.13 of the FSAR, or within the time limit for a less than design-basis heat load case, as evaluated." Staff finds this proposed change to be clarifying, more specific and connected to the technical design basis time limit of FSAR Section 11.2.13, which states that "Following any event that could cause blockage of the concrete cask inlets and outlets, concrete casks shall be restored to operable status in accordance with LCO A 3.1.6 of the Technical Specifications." Based on the limit referring to LCO A.3.1.6, the change is acceptable.

4.4 Evaluation Findings

F4.1 The staff reviewed the application and concludes that the proposed changes to the TS are in compliance with 10 CFR Part 72 and that the applicable design and acceptance criteria have been satisfied. The NRC staff evaluation of the TS changes provides reasonable assurance that the NAC-UMS will continue to provide safe storage of spent nuclear fuel. This conclusion is reached on the basis of a review that considered the regulation itself, appropriate regulatory guides, applicable codes and standards, and accepted engineering practices.

13.0 Technical Specifications Evaluation

The changes to TS, Appendix A, listed below were evaluated in Chapters 3 and 4 of this SER.

- Required Action A.2 in Technical Specification No. A 3.1.6, LCO 3.1.6 was deleted and Action A.3 was renumbered as A.2;
- Condition B in Technical Specification No. A 3.1.6, LCO 3.1.6 was revised to delete Action A.2; and renumber Action A3
- Item A 5.4 was deleted.

13.1 Applicability of Limiting Condition for Operation 3.2.2

In addition to the above changes, the applicant requested that the applicability for LCO 3.2.2 be clarified to state that it is prior to storage conditions. Because the radionuclides that emit gamma rays and neutrons are the only contributors to offsite dose, and these radionuclides continuously decay during storage, the dose rates around the storage cask, and consequently the offsite doses, will be lower at any time during storage than prior to placing the cask into storage. Therefore, the staff finds this change acceptable.

13.2 Evaluation Findings

F13.1 The staff concludes that the conditions for use of the NAC-UMS storage system identify necessary technical specifications to satisfy 10 CFR Part 72 and that the applicable acceptance criteria have been satisfied. The proposed technical specifications provide reasonable assurance that the storage system will allow safe storage of spent fuel. This finding is based on the regulation itself, appropriate regulatory guides, applicable codes and standards, and accepted practices.

CONCLUSION

The staff performed a detailed safety evaluation of the application for Amendment No. 6 to CoC No. 1015 for the NAC-UMS storage system. The staff performed the review in accordance with the guidance in NUREG-1536. Based on the statements and representations contained in the application, as supplemented, and the conditions established in the CoC and its TS, the staff concludes that these changes do not affect the ability of the NAC-UMS storage system to meet the requirements of 10 CFR Part 72.

Issued with CoC No. 1015, Amendment No. 6, on 12/4/18.