



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

**FINAL SAFETY EVALUATION REPORT
NAC INTERNATIONAL
NAC-MPC STORAGE SYSTEM
DOCKET NO. 72-1025
AMENDMENT NO. 8**

Summary

This safety evaluation report (SER) documents the U.S. Nuclear Regulatory Commission (NRC) staff's review and evaluation of Amendment No. 8 to Certificate of Compliance (CoC) No. 1025 for the Model No. NAC-MPC spent fuel storage system. By application dated February 28, 2018 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML18059A784), 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. 1025. NAC demonstrated, as discussed in Sections 3.0 and 4.0 of this SER that the surveillance requirements in TS A 5.3, "Surveillance After an Off-Normal, Accident, or Natural Phenomena Event" can be deleted because these requirements can be achieved with the revised TS A 3.1.6, "CONCRETE CASK Heat Removal System" by ensuring the heat removal capability. NAC requested the following changes to the technical specifications (TS):

- Revise TS No. A 3.1.6, "CONCRETE CASK Heat Removal System" to change Condition A from "LCO [Limiting Condition for Operation] not met" to read : CONCRETE CASK heat removal system inoperable," add new LCO REQUIRED ACTION A.1 "Ensure adequate heat removal to prevent exceeding short-term temperature limits with an Immediate COMPLETION TIME, and renumber old A.1 to A.2 "Restore CONCRETE CASK Heat Removal System to OPERABLE status;"
- Revise renumbered LCO REQUIRED ACTION A.2 COMPLETION TIME from 8 hours to 25 days under TS A 3.1.6;
- Revise TS No. A 3.1.6 CONDITION B from "Required Action and associated Completion Time not met" to "Required Action A.1 or A.2 and associated Completion Time not met;"
- Delete TS No. A 3.1.6 LCO REQUIRED ACTION B.1 "Perform SR [Surveillance Requirement] 3.1.6.1," and renumber old B.2.1 and B.2.2 to B.1 and B.2, respectively;
- Revise renumbered LCO REQUIRED ACTIONS B.1 and B.2 COMPLETION TIMES from 12 hours to 5 days under TS A 3.1.6;
- Revise TS No. A 3.2.2, "CONCRETE CASK Average Surface Dose Rates" APPLICABILITY from "Prior to or at the beginning of STORAGE OPERATIONS" to "Prior to STORAGE OPERATIONS;" and
- Delete TS No. A 5.3, "Surveillance After an Off-Normal, Accident, or Natural Phenomena Event" in its entirety as response surveillance is in principle, covered by existing LCO SRs and frequencies.

In addition, the associated bases presented in the Final Safety Analysis Report (FSAR), Chapters 9, 11, and 12, for the above TS changes have been revised.

In support of the amendment, NAC submitted Revision 18B, of the FSAR for the NAC-MPC 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 description, principal design criteria, confinement, criticality, materials, operating procedures, acceptance tests and maintenance program, radiation protection, accident analyses, and quality assurance.

3.0 Structural Evaluation

In NAC letter dated, February 28, 2018, (ADAMS Accession No. ML18059A784), the applicant requested revisions to the NRC CoC No. 1025 of the NAC-MPC Cask System. Sections revised include: Section A 3.1.6 "CONCRETE CASK Heat Removal System", Section A 3.2.2 "CONCRETE CASK Average Surface Dose Rates" and Section A 5.3 "Surveillance After an Off-Normal, Accident, or Natural Phenomena Event." Specifically, the staff reviewed the following TS A 3.1.6 revisions:

- a. Revised LCO 3.1.6 CONDITION A from "LCO Not Met" to "CONCRETE CASK Heat Removal System Inoperable."
- b. Added new LCO REQUIRED ACTION A.1 "Ensure adequate heat removal to prevent exceeding short-term temperature limits" with an Immediate COMPLETION TIME.
- c. Changed Previous LCO REQUIRED ACTION A.1 to A.2 "Restore CONCRETE CASK Heat Removal System to OPERABLE status" with a revised COMPLETION TIME of 25 days, rather than 8 hours.
- d. Deleted LCO REQUIRED ACTION B.1, Perform SR 3.1.6.1.
- e. Revised LCO REQUIRED ACTION B.2.1 to B. 1 with a revised COMPLETION TIME of "5 days," rather than "12 hours."
- f. Revised LCO REQUIRED ACTION B2.2 to B.2 with a revised COMPLETION TIME of "5 days," rather than "12 hours."

The NRC staff reviewed the proposed changes in the aforementioned sections, which consisted of a number of revisions including new required actions, wording changes, and deletions. The NRC staff focused its review on the proposed changes related to TS A 3.1.6, specifically on whether the proposed changes altered previous safety findings. Further, the staff reviewed whether the TS revisions produced additional component temperatures that could affect the structural performance of the package. The staff reviewed them against the design limits specified in the final safety analysis report (FSAR). The staff found that the requested changes to the TS did not significantly alter the previous safety findings and therefore, are adequate.

Based on the review, the staff concludes that the proposed changes in this amendment have been adequately described and evaluated; and that the package continues to have adequate structural integrity and meets the requirements of 10 CFR Part 72.

4.0 Thermal Evaluation

4.1 Revision to LCO 3.1.6

The TS for this CoC are being revised as follows:

- a. Revised LCO 3.1.6 CONDITION A from "LCO Not Met" to "CONCRETE CASK Heat Removal System Inoperable."
- b. Added new LCO REQUIRED ACTION A.1 "Ensure adequate heat removal to prevent exceeding short-term temperature limits" with an Immediate COMPLETION TIME.
- c. Changed Previous LCO REQUIRED ACTION A.1 to A.2 "Restore CONCRETE CASK Heat Removal System to OPERABLE status" with a revised COMPLETION TIME of 25 days, rather than 8 hours.
- d. Deleted LCO REQUIRED ACTION B.1, Perform SR 3.1.6.1.
- e. Revised LCO REQUIRED ACTION B.2.1 to B. 1 with a revised COMPLETION TIME of "5 days," rather than "12 hours."
- f. Revised LCO REQUIRED ACTION B2.2 to B.2 with a revised COMPLETION TIME of "5 days," rather than "12 hours."

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. Further, the conditions and actions for this class of LCO are fully consistent with others previously approved by the NRC. Therefore, the staff concludes that the revision of Condition A, associated deletions, and subsequent renumbering of Required Action B is acceptable.

4.2 Deletion of TS A 5.3

The current CoC TS includes Section A 5.3, which describes surveillance in response to off-normal, accident or natural phenomena events. The current TS states the independent spent fuel storage installation (ISFSI) shall be inspected within four 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 specify 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 5.3 based on the fact that it is an unnecessary surveillance since the applicant asserts that the surveillance is covered by the surveillance requirements and frequencies of LCO 3.1.6.

The staff reviewed the application, the applicable LCO 3.1.6 and 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.

With the revised LCO 3.1.6, 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. Further, 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 satisfies the requirement of TS Section A 5.3.

Therefore, the staff concludes that the proposed change to delete TS Section A 5.3 is acceptable and will have no impact on the thermal evaluation and safe storage of the cask.

4.3 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 staff evaluation of the TS changes provides reasonable assurance that the NAC-MPC 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 Sections 3.0 and 4.0 and in this section of this SER.

- TS No. A 3.1.6, "CONCRETE CASK Heat Removal System" Condition A was revised from "LCO [Limiting Condition for Operation] not met" to "CONCRETE CASK heat removal system inoperable." New LCO REQUIRED ACTION A.1 "Ensure adequate heat removal to prevent exceeding short-term temperature limits" with an Immediate COMPLETION TIME was added. Further, old A.1 was renumbered to A.2 "Restore CONCRETE CASK Heat Removal System to OPERABLE status;"
- Renumbered LCO REQUIRED ACTION A.2 COMPLETION TIME was revised from 8 hours to 25 days under A 3.1.6;
- TS No. A 3.1.6 CONDITION B was revised from "Required Action and associated Completion Time not met" to "Required Action A.1 or A.2 and associated Completion Time not met;"
- TS No. A 3.1.6 LCO REQUIRED ACTION B.1 "Perform SR [Surveillance Requirement] 3.1.6.1" was deleted. Old B.2.1 and B.2.2 were renumbered to B.1 and B.2, respectively;
- Renumbered LCO REQUIRED ACTIONS B.1 and B.2 COMPLETION TIMES were revised from 12 hours to 5 days under A 3.1.6;
- TS No. A 3.2.2, "CONCRETE CASK Average Surface Dose Rates" APPLICABILITY was revised from "Prior to or at the beginning of STORAGE OPERATIONS" to "Prior to STORAGE OPERATIONS;" and
- TS No. A 5.3, "Surveillance After an Off-Normal, Accident, or Natural Phenomena Event" was deleted in its entirety as response surveillance is in principle, covered by existing LCO SRs and frequencies.

13.1 Applicability of LCO 3.2.2

In addition to the above changes, the applicant requested that the applicability for LCO 3.2.2 be revised to state that the dose rate measurements need to be performed prior to storage conditions. Because the MPC is placed in the storage overpack before being transported to the ISFSI pad and the gamma and neutron sources continue to decrease after the measurements as a result of decay, the dose rates around the storage cask will be lower than the measured data prior to placing the cask onto the storage pad at any time during storage. Therefore, the staff finds this change acceptable.

Changes to TS No. A 3.1.6 were evaluated in Sections 3.0 and 4.0 of this SER. TS No. A 5.3 was evaluated in detail in Section 4.0 of this SER. Further, TS No. A 5.3 was deleted in its entirety to avoid duplication because the change was covered by existing LCO SRs and frequencies.

13.2 Evaluation Findings

F13.1 The staff concludes that the conditions for use of the NAC-MPC 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. 8 to CoC No. 1025 for the NAC-MPC 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, and the conditions established in the CoC and its TS, the staff concludes that these changes do not affect the ability of the NAC-MPC storage system to meet the requirements of 10 CFR Part 72.

Issued with CoC No. 1025, Amendment No. 8, on 2/5/19