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August 31, 2004

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

Attn: Document Control Desk

Subject: MAGNASTOR System - Application for Approval

NAC International, Inc. (NAC) requests approval of the MAGNASTOR System for the storage of spent nuclear fuel under the provisions of 10 CFR 72, Subpart L. In accordance with 10 CFR 72.230, the MAGNASTOR Safety Analysis Report (SAR) describing the proposed cask design, and how it should be used to store spent fuel, is enclosed.

The MAGNASTOR System is comprised of a welded stainless steel transportable storage canister (TSC), a transfer cask and a concrete cask, as well as appropriate handling equipment. The MAGNASTOR System is designed and analyzed for a minimum service life of 50 years.

The MAGNASTOR SAR documents the design bases, design criteria, contents to be stored, and the structural, thermal, criticality, shielding and confinement analyses that demonstrate the adequacy of the MAGNASTOR System in satisfying all of the licensing requirements of 10 CFR 72 for a spent fuel storage cask. In addition, materials evaluations, operating procedures, acceptance tests, maintenance programs, radiation protection, operating controls and limits, quality assurance and decommissioning evaluations are included in the SAR. The analytical methods used to demonstrate the adequacy of the MAGNASTOR System design are the same as those used for the NAC-STC, NAC-UMS<sup>®</sup> and NAC-MPC systems, with the addition of internal convection as a mode of heat transfer in the TSC. The structural analyses were performed using the ANSYS computer code, and the thermal analyses were performed using the ANSYS and FLUENT computer codes. The shielding, criticality and radiation protection analyses were performed using the SCALE, MCNP and NAC-CASC (a modified version of SKYSHINE III) computer codes. Conservatism in the input values and the methodologies used in the analyses ensure that the appropriate code and regulatory limits are satisfied with adequate safety margins. All computer codes used have been verified in accordance with the NAC Quality Assurance Program.

In the MAGNASTOR System, the contents to be stored are confined in the sealed, welded TSC. The TSC contains a fuel basket assembly that is based on a developed cell methodology currently under review by the U.S. Patent Office. The MAGNASTOR System is designed to safely store up to 37 PWR or up to 87 BWR spent fuel assemblies of varying lengths, which are accommodated by two different lengths of TSCs.

The transfer cask is used to facilitate loading of fuel assemblies, welding of the TSC closure lid and port covers, and draining, drying, helium backfilling and transferring of the TSC to the concrete cask.

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The concrete cask is the storage overpack for the TSC. It provides structural support, radiation shielding, protection from the environment and internal airflow paths for natural convection cooling of the TSC during long-term storage.

The MAGNASTOR System is currently being considered by several U.S. utilities for near-term implementation at their operating reactor sites. Therefore, NAC requests that the NRC implement a priority review and approval of the MAGNASTOR System to support these anticipated utility needs. Any additional information requested will be promptly provided.

If you have any comments or questions, please contact me on my direct line at (678) 328-1321.

Sincerely,

A handwritten signature in cursive script that reads 'T.C. Thompson'.

Thomas C. Thompson  
Director, Licensing  
Engineering

Enclosures