ENVIRONMENTAL ASSESSMENT AND FINDING OF NO SIGNIFICANT IMPACT ON PROPOSED AMENDMENT TO 10 CFR PART 72 "LIST OF APPROVED SPENT FUEL STORAGE CASKS: HI STORM 100 REVISION 5"

Office of Nuclear Material Safety and Safeguards

U.S. Nuclear Regulatory Commission (NRC)

September 2007

I. THE PROPOSED ACTION

The proposed action is to amend 10 CFR 72.214 to revise the Holtec International (Holtec) HI-STORM 100 cask system listing within the "List of approved spent fuel storage casks" to include Amendment No. 5 to the Certificate of Compliance (CoC) No. 1014. Amendment No. 5 would modify the present cask system CoC by making changes that would include deletion of the requirement to perform thermal validation tests on thermal systems; an increase in the design basis maximum decay heat loads, namely, to 34 kilowatts (kW) for uniform loading and 36.9 kW for regionalized loading, and introduction of a new decay heat regionalized scheme; an increase in the maximum fuel assembly weight for boiling water reactor fuel in the Multi-Purpose Canister (MPC)-68 from 700 to 730 pounds; an increase in the maximum fuel assembly weight of up to 1,720 pounds for assemblies not requiring spacers, otherwise 1,680 pounds; changes to the assembly characteristics of 16x16 pressurized water reactor fuel assemblies to be qualified for storage in the HI-STORM 100 cask system; a change in the fuel storage locations in the MPC-32 for fuel with axial power shaping rod assemblies and in the fuel storage locations in the MPC-24, MPC-24E, and the MPC-32 for fuel with control rod

assemblies, rod cluster control assemblies, and control element assemblies; elimination of the restriction that fuel debris can only be loaded into the MPC-24EF, MPC-32F, MPC-68F, and MPC-68FF canisters; introduction of a requirement that all MPC confinement boundary components and any MPC components exposed to spent fuel pool water or the ambient environment be made of stainless steel or, for MPC internals, neutron absorber or aluminum; the addition of a threshold heat load below which operation of the Supplemental Cooling System would not be required and modification of the design criteria to simplify the system; minor editorial changes to include clarification of the description of anchored casks, correction of typographical/editorial errors, clarification of the definitions of Loading Operations, Storage Operations, Transport Operations, Unloading Operations, Cask Loading Facility, and Transfer Cask in various locations throughout the CoC and Final Safety Analysis Report (FSAR); and modification of the definition of non-fuel hardware to include the individual parts of the items defined as non-fuel hardware. The HI-STORM 100 cask system can be relied on to provide safe confinement of spent fuel at any reactor site when used in accordance with the conditions and TS of CoC No. 1014.

II. THE NEED FOR THE PROPOSED ACTION

This rulemaking is needed to revise a cask system listing within the “List of approved spent fuel storage casks” in 10 CFR 72.214. On December 30, 2004, the certificate holder, Holtec, submitted an application to the NRC that requested an amendment to CoC No. 1014. The amendment principally included changes to increase the design basis maximum decay heat loads of the HI-STORM 100 cask system and add a new underground storage configuration, designated the HI-STORM 100U, to the CoC. On November 29, 2006, Holtec withdrew the

portion of the application that added the HI-STORM 100U to the CoC. The application, as modified by the December 22, 2006, Revision 2, submittal, and as supplemented on March 20, 2007, March 30, 2007, May 4, 2007, May 22, 2007, June 14, 2007, July 17, 2007, and September 6, 2007, requested changes to the CoC, the TS, and the FSAR to modify the HI-STORM 100 cask system.

Specifically, the proposed changes included deletion of the requirement to perform thermal validation tests on thermal systems; an increase in the design basis maximum decay heat loads, namely, to 34 kW for uniform loading and 36.9 kW for regionalized loading, and introduction of a new decay heat regionalized scheme; an increase in the maximum fuel assembly weight for boiling water reactor fuel in the MPC-68 from 700 to 730 pounds; an increase in the maximum fuel assembly weight of up to 1,720 pounds for assemblies not requiring spacers, otherwise 1,680 pounds; changes to the assembly characteristics of 16x16 pressurized water reactor fuel assemblies to be qualified for storage in the HI-STORM 100 cask system; a change in the fuel storage locations in the MPC-32 for fuel with axial power shaping rod assemblies and in the fuel storage locations in the MPC-24, MPC-24E, and the MPC-32 for fuel with control rod assemblies, rod cluster control assemblies, and control element assemblies; elimination of the restriction that fuel debris can only be loaded into the MPC-24EF, MPC-32F, MPC-68F, and MPC-68FF canisters; introduction of a requirement that all MPC confinement boundary components and any MPC components exposed to spent fuel pool water or the ambient environment be made of stainless steel or, for MPC internals, neutron absorber or aluminum; the addition of a threshold heat load below which operation of the Supplemental Cooling System would not be required and modification of the design criteria to simplify the system; minor editorial changes to include clarification of the description of anchored casks, correction of typographical/editorial errors, clarification of the definitions of Loading Operations, Storage Operations, Transport Operations, Unloading Operations, Cask Loading Facility, and

Transfer Cask in various locations throughout the CoC and FSAR; and modification of the definition of non-fuel hardware to include the individual parts of the items defined as non-fuel hardware.

No other changes to the HI-STORM 100 cask design were requested in this application. The NRC staff performed a detailed safety evaluation of the proposed CoC amendment request and found that an acceptable safety margin is maintained.

III. ENVIRONMENTAL IMPACTS OF PROPOSED ACTION

The potential environmental impact of using the HI-STORM 100 cask system was initially analyzed in the environmental assessment for the final rule to add the HI-STORM 100 cask system to the list of approved spent fuel storage casks in 10 CFR 72.214 (65 FR 25241; May 1, 2000). The environmental assessment for the May 1, 2000, final rule concluded that there would be no significant environmental impact to adding the HI-STORM cask system, and therefore, the NRC issued a finding of no significant impact (FONSI), which continues to be valid. The instant environmental assessment, for this Amendment No. 5, tiers on the environmental assessment for the May 1, 2000, final rule. Tiering on past environmental assessments is a standard process under NEPA.

HI-STORM 100 casks are designed to mitigate the effects of design basis accidents that could occur during storage. Design basis accidents account for human-induced events and the most severe natural phenomena reported for the site and surrounding area. Postulated accidents analyzed for an independent spent fuel storage installation (ISFSI), the type of facility at which a holder of a power reactor operating license would store spent fuel in casks in accordance with 10 CFR Part 72, include tornado winds and tornado-generated missiles, a

design basis earthquake, a design basis flood, an accidental cask drop, lightning effects, fire, explosions, and other incidents.

Considering the specific design requirements for each accident condition, the design of the cask would prevent loss of containment, shielding, and criticality control. Without the loss of either containment, shielding, or criticality control, the risk to public health and safety is not compromised. The NRC staff performed a detailed safety evaluation of the proposed CoC amendment request and found that an acceptable safety margin is maintained, that the proposed changes provide reasonable assurance that the spent fuel can be stored safely and meet the acceptance criteria specified in 10 CFR Part 72, and that there continues to be reasonable assurance that public health and safety will be adequately protected.

The staff documented its findings in a safety evaluation report which is available electronically via the NRC's Electronic Reading Room at http://www.nrc.gov/NRC/ADAMS/index.html. From this site, the public can gain entry into the NRC's Agencywide Document Access and Management System (ADAMS), which provides text and image files of NRC's public documents. The safety evaluation report for Amendment No. 5 can be found under ADAMS Accession No. ML072540157.

Any resulting increase in either occupational exposure or offsite dose rates would remain well within the 10 CFR Part 20 limits. Therefore, the proposed action now under consideration would not change the potential effects analyzed in the environmental assessment for the May 1, 2000, final rule. Thus, the NRC staff has determined that an acceptable safety margin is maintained and that there will be no significant effect on the human environment as a result of the NRC approving Amendment No. 5.

IV. ALTERNATIVE TO THE PROPOSED ACTION

The alternative to this action is to withhold approval of Amendment No. 5 and to require any Part 72 general licensee, seeking to load spent fuel into HI-STORM 100 casks under the changes described in Amendment No. 5, to request an exemption from the requirements of 10 CFR 72.212 and 72.214. Under this alternative, each interested Part 72 licensee would have to prepare, and the NRC would have to review, a separate exemption request, thereby increasing the administrative burden upon the NRC and the costs to each licensee.

V. ALTERNATIVE USE OF RESOURCES

There were no irreversible commitments of resources determined in this assessment.

VI. AGENCIES AND PERSONS CONTACTED

No agencies or persons outside the NRC were contacted in connection with the preparation of this environmental assessment.

VII. FINDING OF NO SIGNIFICANT IMPACT

The environmental impacts of the proposed action have been reviewed under the requirements in 10 CFR Part 51.

Based on the foregoing environmental assessment, the NRC concludes that this rulemaking entitled “List of Approved Spent Fuel Storage Casks: HI-STORM 100 Revision 5 will

not have a significant effect on the human environment. Therefore, the NRC has determined that an environmental impact statement is not necessary for this rule.

Certain documents related to this rulemaking, including comments received by the NRC, may be examined at the NRC Public Document Room, O-1F21, One White Flint North, 11555 Rockville Pike, Rockville, MD.