

NUCLEAR REGULATORY COMMISSION

10 CFR Part 72

RIN 3150-AG97

List of Approved Spent Fuel Storage Casks: HI-STORM 100 Revision

AGENCY: Nuclear Regulatory Commission.

ACTION: Final rule.

SUMMARY: The Nuclear Regulatory Commission (NRC) is amending its regulations revising the Holtec International HI-STORM 100 cask system listing within the list of approved spent fuel storage casks to include Amendment 1 to Certificate of Compliance (CoC) Number 1014. This amendment modifies the present cask system design to: add four new multipurpose canisters; add new containers for damaged fuel; add the HI-STORM 100S overpack and the 100A and 100SA high-seismic anchored overpacks; allow the storage of high-burnup fuel; delete the Technical Specifications for special requirements for the first systems in place and for training requirements and relocate these requirements to the main body of CoC 1014; and allow the storage of selected nonfuel hardware. The amendment also uses revised thermal analysis tools to include natural convection heat transfer, revises the helium backfill requirements to allow a helium density measurement to be used, allows a helium drying system rather than the

existing vacuum drying system, and requires soluble boron during canister loading for certain higher enriched fuels. In addition, modifications will be made to applicable CoC conditions and sections of Appendices A and B to the CoC to reflect the changes.

EFFECTIVE DATE: This final rule is effective upon publication in the Federal Register.

FOR FURTHER INFORMATION CONTACT: Jayne M. McCausland, telephone (301) 415-6219, e-mail jmm2@nrc.gov, of the Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555-0001.

SUPPLEMENTARY INFORMATION:

Background

Section 218(a) of the Nuclear Waste Policy Act of 1982, as amended (NWPA), requires that “[t]he Secretary [of Energy] shall establish a demonstration program, in cooperation with the private sector, for the dry storage of spent nuclear fuel at civilian nuclear reactor power sites, with the objective of establishing one or more technologies that the [Nuclear Regulatory] Commission may, by rule, approve for use at the sites of civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site-specific approvals by the Commission.” Section 133 of the NWPA states, in part, “[t]he Commission shall, by rule, establish procedures for the licensing of any technology approved by the Commission under Section 218(a) for use at the site of any civilian nuclear power reactor.”

To implement this mandate, the NRC approved dry storage of spent nuclear fuel in NRC-approved casks under a general license, publishing a final rule in 10 CFR Part 72 entitled, "General License for Storage of Spent Fuel at Power Reactor Sites" (55 FR 29181; July 18, 1990). This rule also established a new Subpart L within 10 CFR Part 72 entitled, "Approval of Spent Fuel Storage Casks" containing procedures and criteria for obtaining NRC approval of dry storage cask designs. The NRC subsequently issued a final rule on May 1, 2000 (65 FR 25241), that approved the Holtec International HI-STORM 100 cask design and added it to the list of NRC-approved cask designs in § 72.214 as Certificate of Compliance Number (CoC No.) 1014.

Discussion

On July 3, 2001, and as supplemented on August 13 and 17, and October 5, 12, and 19, 2001, the certificate holder, Holtec International, submitted an application to the NRC to amend CoC No. 1014 to permit a Part 72 licensee to: (1) add four new multipurpose canisters - three for pressurized water reactor fuel and one for boiling water reactor fuel; (2) add new containers for damaged fuel; (3) add the HI-STORM 100S overpack and the 100A and 100SA high-seismic anchored overpacks; (4) allow the storage of high-burnup fuel; (5) delete the Technical Specifications for special requirements for the first systems in place and for training requirements and relocate these requirements to the main body of CoC 1014; and (6) allow the storage of selected nonfuel hardware. The amendment also will utilize revised thermal analysis tools to include natural convection heat transfer, revise the helium backfill requirements to allow a helium density measurement to be used, allow a helium drying system rather than the existing vacuum drying system, and require soluble boron during canister loading for certain higher enriched fuels. In addition, modifications have been made to Conditions 1.a., 1.b., 2, 3, 5, 9,

10, and 11 of the CoC; Sections 3.0 and 5.0 of Appendix A to the CoC; and Sections 1.0, 2.0, and 3.0 of Appendix B to the CoC to reflect the changes. No other changes to the Holtec International HI-STORM 100 cask system 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. In addition, the NRC staff has determined that there is still reasonable assurance that public health and safety and the environment will be adequately protected.

This rule revises the Holtec International HI-STORM 100 cask design listing in § 72.214 by adding Amendment No. 1 to CoC No. 1014. The amendment consists of changes to the Technical Specifications as described above. The particular Technical Specifications that are changed are identified in the NRC staff's Safety Evaluation Report (SER) for Amendment 1.

The NRC published a direct final rule (67 FR 14627; March 27, 2002) and the companion proposed rule (67 FR 14662) in the Federal Register to revise the Holtec International HI-STORM 100 cask system listing in 10 CFR 72.214 to include Amendment 1 to the CoC. The comment period ended on April 26, 2002. Three comment letters were received on the proposed rule. One comment was considered to be significant and adverse and warranted withdrawal of the direct final rule. A notice of withdrawal was published in the Federal Register on June 7, 2002; 67 FR 39260. Additionally, the NRC staff made minor editorial changes, in response to the two other comment letters, to Appendix B to CoC 1014, for the HI-STORM 100 cask system.

The NRC finds that the amended Holtec International HI-STORM 100 cask system, as designed and when fabricated and used in accordance with the conditions specified in its CoC, meets the requirements of Part 72. Thus, use of the Holtec International HI-STORM 100 cask system, as approved by the NRC, will continue to provide adequate protection of public health

and safety and the environment. With this final rule, the NRC is approving the use of the Holtec International HI-STORM 100 cask system under the general license in 10 CFR Part 72, Subpart K, by holders of power reactor operating licenses under 10 CFR Part 50. Simultaneously, the NRC is issuing a final SER and CoC that will be effective on **[insert date the rule is effective]**. Single copies of the CoC and SER are available for public inspection and/or copying for a fee at the NRC Public Document Room, 11555 Rockville Pike, Rockville, MD. Copies of the public comments are available for review in the NRC Public Document Room, 11555 Rockville Pike, Rockville, MD.

Summary of Public Comments on the Proposed Rule

The NRC received three comment letters on the proposed rule. The comments included the State of Illinois and two from the applicant (Holtec International).

Comments on the Holtec International HI-STORM 100 Cask System

Minor changes were made to Appendix B to the CoC to correct several inconsistencies and a typographical error. The SER was not changed as a result of public comments. A review of the comments and the NRC staff's responses follow:

Comment: One commenter suggested editorial changes to Appendix B of the CoC. These changes include a correction to Table 2.1-1 where the term "water displacement guide tube plugs" should be used rather than the incorrect term "water displacement rod guide tubes" and a typographical error in Table 2.1-3.

Response: The NRC staff agreed with the comments. The suggested changes have

been made to Appendix B.

Comment: One commenter raised concerns with the provisions in the draft amended certificate that would allow licensees to store certain items of nonfuel hardware with the spent fuel in the cask. The commenter assumed that this nonfuel hardware was Greater-than-Class-C (GTCC) waste and noted that the NRC, in a recent rulemaking, had prohibited commingling of GTCC waste and spent fuel in the same cask except on a case-by-case basis. The commenter's concerns were focused on (1) the storage of GTCC waste commingled with the fuel, (2) the possibility of adverse interactions between the chemical elements and compounds in the nonfuel hardware and the fuel as well as the material components of the cask, and (3) the absence of documentation of NRC's analysis and criteria to accept storage of the nonfuel hardware.

Response: The NRC disagrees with the comment. First, under 10 CFR 72.3, spent fuel is defined to include "the special nuclear material, byproduct material, source material, and other radioactive materials associated with fuel assemblies." The nonfuel hardware included burnable poison rod assemblies, thimble plug devices, control rod assemblies, axial power shaping rods, wet annular burnable absorbers, rod cluster control assemblies, control element assemblies, water displacement guide tube plugs, and orifice rod assemblies. These nonfuel hardware items permitted to be stored in the cask by this amendment are "other radioactive materials associated with fuel assemblies." As explained in the GTCC waste rule¹, the NRC believes that appropriate interim storage for these nonfuel components is with the associated spent fuel. However, with respect to GTCC waste that is not integral to spent fuel assemblies, the NRC concluded that this waste should not be stored in the same cask with spent fuel and that storing this waste would only be allowed on a case-by-case basis after a thorough analysis

¹The NRC published a final rule amending 10 CFR Part 72 which authorized the storage of GTCC waste under a Part 72 specific license on October 11, 2001; 66 FR 51823.

of possible adverse interactions between the materials in these components and the materials in the cask.

Second, materials interaction between spent fuel and radioactive materials associated with fuel assemblies was considered in the definitions at 10 CFR 72.3 and in the recent rulemaking associated with Interim Storage for Greater Than Class C Waste at 66 FR 51823, and the comment provided no new information suggesting a need for reconsideration of this issue in this rulemaking. From basic corrosion principles, in order for galvanic corrosion/chemical reactions to occur between the spent fuel, the confinement boundary, and nonfuel hardware, an electrolyte is needed (water) and the components must be fairly far apart from one another on the galvanic series. The NRC staff approved the storage of the nonfuel hardware because the cask is dry, backfilled with an inert gas (i.e., no electrolyte is present), and the materials are not at the extreme end of the galvanic series from the spent fuel.

Third, in documenting the NRC's review findings and conclusions, it is neither practical nor appropriate to specify each detail considered in the staff's determination of acceptability. Rather, the documentation focuses on the safety and risk significant factors of the cask's overall performance in areas such as structural integrity, confinement boundary integrity, fuel cladding integrity, radiation shielding, criticality safety, heat removal, and operations and maintenance during normal and accident conditions. Although materials interactions with the nonfuel hardware identified in the comment were considered for acceptability in dry cask storage systems, they do not present conditions that are significant enough to warrant documentation in the SER.

Summary of Final Revisions

Section 72.214 List of approved spent fuel storage casks.

Certificate No. 1014 is revised by adding the effective date of the initial certificate and the effective date of Amendment Number 1.

Good Cause to Dispense With Deferred Effective Date Requirement

The NRC finds that good cause exists to waive the 30-day deferred effective date provisions of the Administrative Procedure Act (5 U.S.C. 553(d)). The primary purpose of the delayed effective date requirement is to give affected persons; e.g., licensees, a reasonable time to prepare to comply with or take other action with respect to the rule. In this case, the rule does not require any action to be taken by licensees. The regulation allows, but does not require, use of the amended Holtec International HI-STORM 100 cask system for the storage of spent nuclear fuel. The amended Holtec International HI-STORM 100 cask system meets the requirements of 10 CFR Part 72, is ready to be used, and, as approved by the NRC, will continue to provide adequate protection of public health and safety and the environment.

Agreement State Compatibility

Under the “Policy Statement on Adequacy and Compatibility of Agreement State Programs” approved by the Commission on June 30, 1997, and published in the Federal Register on September 3, 1997 (62 FR 46517), this rule is classified as compatibility Category

“NRC.” Compatibility is not required for Category “NRC” regulations. The NRC program elements in this category are those that relate directly to areas of regulation reserved to the NRC by the Atomic Energy Act of 1954, as amended (AEA), or the provisions of Title 10 of the Code of Federal Regulations. Although an Agreement State may not adopt program elements reserved to NRC, it may wish to inform its licensees of certain requirements via a mechanism that is consistent with the particular State’s administrative procedure laws, but does not confer regulatory authority on the State.

Voluntary Consensus Standards

The National Technology Transfer Act of 1995 (Pub. L. 104-113) requires that Federal agencies use technical standards that are developed or adopted by voluntary consensus standards bodies unless the use of such a standard is inconsistent with applicable law or otherwise impractical. In this final rule, the NRC is amending the Holtec International HI-STAR 100 cask system within the list of NRC-approved cask systems for spent fuel storage in 10 CFR 72.214. This action does not constitute the establishment of a standard that establishes generally-applicable requirements.

Finding of No Significant Environmental Impact: Availability

Under the National Environmental Policy Act of 1969, as amended, and the Commission's regulations in Subpart A of 10 CFR Part 51, the NRC has determined that this rule is not a major Federal action significantly affecting the quality of the human environment and therefore an environmental impact statement is not required. This final rule amends the CoC for the Holtec International HI-STORM 100 cask system within the list of approved spent

fuel storage casks that power reactor licensees can use to store spent fuel at reactor sites under a general license. The amendment modifies the present cask system design to: (1) add four new multipurpose canisters - three for pressurized water reactor fuel and one for boiling water reactor fuel; (2) add new containers for damaged fuel; (3) add the HI-STORM 100S overpack and the 100A and 100SA high-seismic anchored overpacks; (4) allow the storage of high-burnup fuel; (5) delete the Technical Specification for special requirements for the first systems in place and for training requirements and relocate these requirements to the main body of CoC 1014; and (6) allow the storage of selected nonfuel hardware. The amendment also utilizes revised thermal analysis tools to include natural convection heat transfer, revises the helium backfill requirements to allow a helium density measurement to be used, allows a helium drying system rather than the existing vacuum drying system, and requires soluble boron during canister loading for certain higher enriched fuels. In addition, modifications have been made to Conditions 1.a., 1.b., 2, 3, 5, 9, 10, and 11 of the CoC; Sections 3.0 and 5.0 of Appendix A to the CoC; and Sections 1.0, 2.0, and 3.0 of Appendix B to the CoC to reflect the changes. The environmental assessment and finding of no significant impact on which this determination is based are available for inspection at the NRC Public Document Room, One White Flint North, 11555 Rockville Pike, Room O-1F23, Rockville, MD. Single copies of the environmental assessment and finding of no significant impact are available from Jayne M. McCausland, Office of Nuclear Material Safety and Safeguards, U.S. Nuclear Regulatory Commission, Washington, DC 20555, telephone (301) 415-6219, e-mail jmm2@nrc.gov.

Paperwork Reduction Act Statement

This final rule does not contain a new or amended information collection requirement subject to the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.). Existing

requirements were approved by the Office of Management and Budget, approval number 3150-0132.

Public Protection Notification

If a means used to impose an information collection does not display a currently valid OMB control number, the NRC may not conduct or sponsor, and a person is not required to respond to, the information collection.

Regulatory Analysis

On July 18, 1990 (55 FR 29181), the Commission issued an amendment to 10 CFR Part 72. The amendment provided for the storage of spent nuclear fuel in cask systems with designs approved by the NRC under a general license. Any nuclear power reactor licensee can use cask systems with designs approved by the NRC to store spent nuclear fuel if it notifies the NRC in advance, the spent fuel is stored under the conditions specified in the cask's CoC, and the conditions of the general license are met. In that rule, four spent fuel storage casks were approved for use at reactor sites and were listed in 10 CFR 72.214. That rule envisioned that storage casks certified in the future could be routinely added to the listing in 10 CFR 72.214 through the rulemaking process. Procedures and criteria for obtaining NRC approval of new spent fuel storage cask designs were provided in 10 CFR Part 72, Subpart L. On May 1, 2000 (65 FR 25241), the NRC issued an amendment to Part 72 that approved the Holtec International HI-STORM 100 cask design by adding it to the list of NRC-approved cask designs in § 72.214. On July 3, 2001, and as supplemented on August 13 and 17, and

October 5, 12, and 19, 2001, the certificate holder, Holtec International, submitted an application to the NRC to amend CoC No. 1014 to permit a Part 72 licensee to: (1) add four new multipurpose canisters - three for pressurized water reactor fuel and one for boiling water reactor fuel; (2) add new containers for damaged fuel; (3) add the HI-STORM 100S overpack and the 100A and 100SA high-seismic anchored overpacks; (4) allow the storage of high-burnup fuel; (5) delete the Technical Specifications for special requirements for the first systems in place and for training requirements and relocate these requirements to the main body of CoC 1014; and (6) allow the storage of selected nonfuel hardware. The amendment also will utilize revised thermal analysis tools to include natural convection heat transfer, revise the helium backfill requirements to allow a helium density measurement to be used, allow a helium drying system rather than the existing vacuum drying system, and require soluble boron during canister loading for certain higher enriched fuels. In addition, modifications will be made to Conditions 1.a., 1.b., 2, 3, 5, 9, 10, and 11 of the CoC; Sections 3.0 and 5.0 of Appendix A to the CoC; and Sections 1.0, 2.0, and 3.0 of Appendix B to the CoC to reflect the changes.

The alternative to this action is to withhold approval of this amended cask system design and issue a site-specific license to each licensee. This alternative would cost both the NRC and the utilities more time and money because each utility would have to pursue an exemption or a site-specific license. Conducting site-specific reviews would ignore the procedures and criteria currently in place for the addition of new cask designs that can be used under a general license, and would be in conflict with NWPAs direction to the Commission to approve technologies for the use of spent fuel storage at the sites of civilian nuclear power reactors without, to the maximum extent practicable, the need for additional site reviews. This alternative also would tend to exclude new vendors from the business market without cause and would arbitrarily limit the choice of cask designs available to power reactor licensees.

This final rule will eliminate the above problems and is consistent with previous

Commission actions. Further, this final rule will have no adverse effect on public health and safety. This final rule has no significant identifiable impact on or benefit to other Government agencies.

Based on the above discussion of the benefits and impacts of the alternatives, the NRC concludes that the requirements of the final rule are commensurate with the Commission's responsibilities for public health and safety and the common defense and security. No other available alternative is believed to be as satisfactory, and thus, this action is recommended.

Regulatory Flexibility Certification

In accordance with the Regulatory Flexibility Act of 1980 (5 U.S.C. 605(b)), the Commission certifies that this rule will not, if promulgated, have a significant economic impact on a substantial number of small entities. This rule affects only the licensing and operation of nuclear power plants, independent spent fuel storage facilities, and Holtec International. The companies that own these plants do not fall within the scope of the definition of "small entities" set forth in the Regulatory Flexibility Act or the Small Business Size Standards set out in regulations issued by the Small Business Administration at 13 CFR Part 121.

Backfit Analysis

The NRC has determined that the backfit rule (10 CFR 50.109 or 10 CFR 72.62) does not apply to this rule because this amendment does not involve any provisions that would impose backfits as defined in the backfit rule. Therefore, a backfit analysis is not required.

Small Business Regulatory Enforcement Fairness Act

In accordance with the Small Business Regulatory Enforcement Fairness Act of 1996, the NRC has determined that this action is not a major rule and has verified this determination with the Office of Information and Regulatory Affairs, Office of Management and Budget.

List of Subjects in 10 CFR Part 72

Administrative practice and procedure, Criminal penalties, Manpower training programs, Nuclear materials, Occupational safety and health, Penalties, Radiation protection, Reporting and recordkeeping requirements, Security measures, Spent fuel, Whistleblowing.

For the reasons set out in the preamble and under the authority of the Atomic Energy Act of 1954, as amended; the Energy Reorganization Act of 1974, as amended; and 5 U.S.C. 553; the NRC is proposing to adopt the following amendments to 10 CFR part 72.

PART 72--LICENSING REQUIREMENTS FOR THE INDEPENDENT STORAGE OF SPENT NUCLEAR FUEL AND HIGH-LEVEL RADIOACTIVE WASTE

1. The authority citation for Part 72 continues to read as follows:

AUTHORITY: Secs. 51, 53, 57, 62, 63, 65, 69, 81, 161, 182, 183, 184, 186, 187, 189, 68 Stat. 929, 930, 932, 933, 934, 935, 948, 953, 954, 955, as amended, sec. 234, 83 Stat. 444, as amended (42 U.S.C. 2071, 2073, 2077, 2092, 2093, 2095, 2099, 2111, 2201, 2232, 2233, 2234, 2236, 2237, 2238, 2282); sec. 274, Pub. L. 86-373, 73 Stat. 688, as amended (42 U.S.C. 2021);

sec. 201, as amended, 202, 206, 88 Stat. 1242, as amended, 1244, 1246 (42 U.S.C. 5841, 5842, 5846); Pub. L. 95-601, sec. 10, 92 Stat. 2951 as amended by Pub. L. 102-486, sec. 7902, 106 Stat. 3123 (42 U.S.C. 5851); sec. 102, Pub. L. 91-190, 83 Stat. 853 (42 U.S.C. 4332); secs. 131, 132, 133, 135, 137, 141, Pub. L. 97-425, 96 Stat. 2229, 2230, 2232, 2241, sec. 148, Pub. L. 100-203, 101 Stat. 1330-235 (42 U.S.C. 10151, 10152, 10153, 10155, 10157, 10161, 10168).

Section 72.44(g) also issued under secs. 142(b) and 148(c), (d), Pub. L. 100-203, 101 Stat. 1330-232, 1330-236 (42 U.S.C. 10162(b), 10168(c),(d)). Section 72.46 also issued under sec. 189, 68 Stat. 955 (42 U.S.C. 2239); sec. 134, Pub. L. 97-425, 96 Stat. 2230 (42 U.S.C. 10154). Section 72.96(d) also issued under sec. 145(g), Pub. L. 100-203, 101 Stat. 1330-235 (42 U.S.C. 10165(g)). Subpart J also issued under secs. 2(2), 2(15), 2(19), 117(a), 141(h), Pub. L. 97-425, 96 Stat. 2202, 2203, 2204, 2222, 2244, (42 U.S.C. 10101, 10137(a), 10161(h)). Subparts K and L are also issued under sec. 133, 98 Stat. 2230 (42 U.S.C. 10153) and sec. 218(a), 96 Stat. 2252 (42 U.S.C. 10198).

2. In Section 72.214, Certificate of Compliance 1014 is added to read as follows:

§ 72.214 List of approved spent fuel storage casks.

* * * * *

Certificate Number: 1014

Initial Certificate Effective Date: June 1, 2000

Amendment Number 1 Effective Date: **(insert date of publication in the Federal Register)**

SAR Submitted by: Holtec International

SAR Title: Final Safety Analysis Report for the HI-STORM 100 Cask System

Docket Number: 72-1014

Certificate Expiration Date: June 1, 2020

Model Number: HI-STORM 100

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Dated at Rockville, Maryland, this 30th day of June, 2002.

For the Nuclear Regulatory Commission.

/RA/
William D. Travers,
Executive Director for Operations.

Certificate Expiration Date: June 1, 2020

Model Number: HI-STORM 100

* * * * *

Dated at Rockville, Maryland, this 30th day of June, 2002.

For the Nuclear Regulatory Commission.

/RA/

William D. Travers,
Executive Director for Operations.

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