Entergy Nuclear South
Entergy Operations, Inc.
17265 River Road
Killona, LA 70057-3093
Tel 504 739 6660
Fax 504 739 6678
jkowale@entergy.com

Joseph A. Kowalewski
Vice President, Operations
Waterford 3

W3F1-2009-0046

September 9, 2009

U.S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Subject: License Amendment Request
To Modify Technical Specification 3/4.9.7, Crane Travel - Fuel Handling Building
Waterford Steam Electric Station, Unit 3 (Waterford 3)
Docket No. 50-382
License No. NPF-38

REFERENCES:

1. Final Safety Analysis Report for the Holtec International Storage and Transfer Operation Reinforced Module Cask System (HI-STORM 100 Cask System), Holtec Report HI-2002444, Docket 72-1014, Revision 7, August 2008.
2. NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, U.S. Nuclear Regulatory Commission, July 1980. (ADAMS Accession No. ML070250180)
3. NUREG-0800 Section 9.1.5 Rev. 1, Standard Review Plan for Overhead Heavy Load Handling Systems, March 2007. (ADAMS Accession No. ML062260190)
4. ANSI N14.6, American National Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials, American National Standards Institute, June 1993.
5. ASME B30.9, Slings, American Society of Mechanical Engineers, 2003.
6. NRC Regulatory Issue Summary 2005-25: Clarification of NRC Guidelines for Control of Heavy Loads, October 31, 2005. (ADAMS Accession No. ML052340485)
7. NRC Regulatory Issue Summary 2005-25, Supplement 1, Clarification of NRC Guidelines for Control of Heavy Loads, May 29, 2007. (ADAMS Accession No. ML071210434)

Dear Sir or Madam:

Pursuant to 10 CFR 50.90, Entergy Operations, Inc. (Entergy) hereby requests the following amendment for Waterford 3 Steam Electric Station (SES). The proposed amendment revises Technical Specification 3/4.9.7, Crane Travel - Fuel Handling Building, to permit certain

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operations needed for dry cask storage of spent nuclear fuel. Current wording of Technical Specification 3/4.9.7 would prohibit travel of the lid for the spent fuel storage canister over irradiated fuel in the canister during canister operations. The proposed change to this Technical Specification (while continuing to prohibit travel of a heavy load over irradiated fuel assemblies in the spent fuel pool) would permit travel of loads in excess of 2,000 lbs over a transfer cask containing irradiated fuel assemblies, provided a single-failure-proof handling system is used.

Attachment 1 provides an analysis of the proposed Technical Specification change. Attachment 2 provides a mark-up of the proposed changed page. Attachment 3 provides a mark-up of changes to the associated Technical Specification Bases page for information only.

The proposed change has been evaluated in accordance with 10 CFR 50.91 (a)(1) using criteria in 10 CFR 50.92(c), and it has been determined that this change involves no significant hazards. The bases for this determination are included in the attached submittal.

There is a new regulatory commitment contained in Attachment 1, as follows: When the Multi-Purpose Canister (MPC) lid is connected to the transfer cask lift yoke and the lift yoke extension if used, designed to ANSI N14.6 (Reference 4) requirements as specified in the HI-STORM FSAR (Reference 1) during handling of the MPC lid over the loaded MPC-32 canister, the slings between the lid and the lifting device shall be constructed of metallic wire rope and meet the requirements of ASME B30.9 (Reference 5) and NUREG-0612 (Reference 2). This, in combination with the upgraded Fuel Handling Building (FHB) crane, provides for a single-failure-proof handling system as identified in NUREG-0800 Section 9.1.5 (Reference 3). This single-failure-proof handling system is also responsive to the reemphasized guidance in Regulatory Issue Summary (RIS) 2005-25 (Reference 6), including RIS 2005-25, Supplement 1 (Reference 7).

Entergy requests approval of the proposed amendment by September 15, 2010, in support of the dry cask storage operations necessary to store spent fuel at an onsite Independent Spent Fuel Storage Installation. Once approved, the amendment shall be implemented prior to the start of the dry cask storage operations. Although this request is neither exigent nor emergency, your prompt review is requested.

If you have any questions or require additional information, please contact Robert J. Murillo, Manager, Licensing at (504) 739-6715.

I declare under penalty of perjury that the foregoing is true and correct. Executed on September 9, 2009.

Sincerely,

Attachments:
1. Analysis of Proposed Technical Specification Change
2. Proposed Technical Specification Changes (mark-up)
3. Changes to Technical Specification Bases Pages - For Information Only

cc: Mr. Elmo E. Collins, Jr.
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
612 E. Lamar Blvd., Suite 400
Arlington, TX 76011-4125

NRC Senior Resident Inspector
Waterford Steam Electric Station Unit 3
P.O. Box 822
Killona, LA 70066-0751

U. S. Nuclear Regulatory Commission
Attn: Mr. N. Kalyanam
Mail Stop O-07D1
Washington, DC 20555-0001

Wise, Carter, Child & Caraway
ATTN: J. Smith
P.O. Box 651
Jackson, MS 39205

Winston & Strawn
ATTN: N.S. Reynolds
1700 K Street, NW
Washington, DC 20006-3817

Morgan, Lewis & Bockius LLP
ATTN: T.C. Poindexter
1111 Pennsylvania Avenue, NW
Washington, DC 20004

Attachment 1

W3F1-2009-0046

Analysis of Proposed Technical Specification Change

1.0 DESCRIPTION

This is a request to amend the Operating License for Waterford 3 (WF3).

The proposed amendment revises Technical Specification 3/4.9.7, Crane Travel - Fuel Handling Building, to permit certain operations needed for dry cask storage of spent nuclear fuel. Current wording of Technical Specification 3/4.9.7 would prohibit travel of the lid for the spent fuel storage canister over irradiated fuel in the canister. The proposed change to this Technical Specification (while continuing to prohibit travel of a heavy load over irradiated fuel assemblies in the spent fuel pool) would permit travel of loads in excess of 2,000 lbs over a transfer cask containing irradiated fuel assemblies, provided a single-failure-proof handling system is used.

2.0 PROPOSED CHANGES

The proposed Technical Specification changes, which are submitted for NRC review and approval, are provided in Attachment 2. A markup of the Technical Specification Bases is included in Attachment 3 for information only.

Technical Specification Limiting Condition for Operation 3.9.7.b is revised as follows:

> *Cranes in the fuel handling building shall be restricted as follows:*
>
> b) Loads in excess of 2000 pounds shall be prohibited from travel over irradiated fuel assemblies in the Fuel Handling Building, except over assemblies in a transfer cask using a single-failure-proof handling system.

Technical Specification 3.9.7 ACTION statement b. is revised as follows:

> With loads in excess of 2000 pounds over irradiated fuel assemblies in the Fuel Handling Building, except over assemblies in a transfer cask using a single-failure-proof handling system, place the crane load in a safe position.

Technical Specification Surveillance Requirement 4.9.7.2 is revised as follows:

> The electrical interlock system which prevents crane main hook travel over irradiated fuel assemblies in the Fuel Handling Building, except over assemblies in a transfer cask using a single-failure-proof handling system, shall be demonstrated OPERABLE within 7 days prior to crane use and at least once per 7 days thereafter during crane operation.

Technical Specification Surveillance Requirement 4.9.7.3 is revised as follows:

> Administrative controls which prevent crane auxiliary hook travel with loads in excess of 2000 pounds over the irradiated fuel assemblies in the Fuel Handling Building, including over assemblies in a transfer cask, shall be enforced during crane operations.

The following statement at the end of Technical Specification, which is a footnote to Surveillance Requirement 4.9.7.2, is deleted since it is no longer applicable. This statement being deleted reads as follows:

#The crane main hook electrical interlocks may be replaced with administrative controls for activities associated with the implementation of the spent fuel rerack project being performed prior to Refueling Outage 9. While these administrative controls are in place , the performance of SR 4.9.7.2 is not required.

3.0 BACKGROUND

This License Amendment Request proposes revising the WF3 Technical Specification 3/4.9.7, Crane Travel - Fuel Handling Building, to permit certain operations needed for dry cask storage of spent nuclear fuel. Entergy plans to pursue use of dry cask storage at WF3 using the general license of 10 CFR 72.210 with an onsite Independent Spent Fuel Storage Installation (ISFSI), and has selected Holtec International's (Holtec) HI-STORM 100 dry cask storage system with the MPC-32 multi-purpose canister. For spent fuel operations, the MPC-32 canister will be housed in the HI-TRAC transfer cask in the cask storage area. Spent fuel assemblies will be moved via the spent fuel handling machine, described in Section 9.1 of the Waterford 3 (WF3) Updated Final Safety Analysis Report (UFSAR) (Reference 7.1). After the MPC-32 has been loaded with spent fuel assemblies, it is necessary to place the lid on the MPC-32. However, the MPC-32 lid weighs approximately 9,650 lbs. In addition, it will be necessary to use the HI-TRAC transfer cask lift yoke (and lift yoke extension if used) lifting devices over spent fuel assemblies in the MPC-32 during dry cask loading operations. The weight of each of these items is in excess of 2,000 lbs. Technical Specification 3/4.9.7 currently prohibits loads in excess of 2,000 lbs from traveling over irradiated fuel assemblies in the Fuel Handling Building (FHB). The proposed change to this Technical Specification would permit travel of loads in excess of 2,000 lbs over a transfer cask containing irradiated fuel assemblies to facilitate dry cask storage operations, conditional upon use of a single-failure-proof handling system. NUREG-0800 Section 9.1.5 Paragraph III.4.C (Reference 7.9) indicates that a single-failure-proof handling system consists of a crane designed to the criteria of NUREG-0554 (Reference 7.10), with lifting devices selected to satisfy the requirements of ANSI N14.6 (Reference 7.11) or ASME B30.9 (Reference 7.12). The revised technical specification would continue to prohibit travel of loads in excess of 2,000 lbs over irradiated fuel assemblies in the remainder of the FHB, including the spent fuel pool, even if the load is carried by a single-failure-proof handling system.

Entergy will upgrade the existing FHB cask crane to meet the single-failure-proof criteria of NUREG 0554 (Reference 7.10) and NUREG 0612 (Reference 7.13) as is applicable for the modification of the existing non single-failure-proof crane. As part of this upgrade, the existing trolley will be completely replaced with one which includes a single-failure-proof main hoist, all designed and qualified in accordance with the appropriate requirements of ASME NOG-1 (Reference 7.14). All upgrade modifications will be made prior to commencement of dry cask storage operations. The single-failure-proof upgrade of the existing FHB cask crane will be made under the provisions of 10CFR50.59 (RIS 2005-25 Supplement 1 regulatory expectations associated with 10CFR50.59 and 10CFR50.71(e)). The capacity of the FHB cask crane is not being changed - the main hoist capacity will remain at 125 tons and the capacity of each of the two auxiliary hoists will remain at 15 tons.

The transfer cask lift yoke and lift yoke extension lifting devices are designed per ANSI N14.6 (Reference 7.11). When the MPC lid is connected to the lift yoke and lift yoke extension if used, the slings that connect the lid to the lifting device shall be constructed of metallic wire rope and

be in accordance with the requirements of ASME B30.9 (Reference 7.12) and NUREG-0612 (Reference 7.13).

4.0 TECHNICAL ANALYSIS

The HI-STORM 100 Dry Cask Storage System and Heavy Load Issue with Spent Fuel Loading

Entergy has determined that based on current inventory and additional spent fuel projected to be generated in the future, the spent fuel pool capacity is not adequate to store all spent nuclear fuel assemblies until the end of the plant life. Therefore, the need for additional spent fuel storage space is required, and WF3 must make provisions to store additional quantities of spent fuel on site. Entergy plans to pursue use of dry cask storage at WF3 using the general license of 10 CFR 72.210 with an onsite ISFSI that will be designed for a storage capacity of 72 storage units, with each unit holding 32 spent fuel assemblies.

The Spent Fuel Dry Storage (SFDS) system selected for use at the WF 3 ISFSI is the HI-STORM 100S Version B MPC-32 dry cask storage system developed by Holtec. This is a canister-based storage system licensed by the NRC (References 7.4-7.8) for storage of spent nuclear fuel at an ISFSI using the general license. The system is comprised of three primary components: MPC-32, HI-TRAC 125 and HI-STORM 100S. The MPC-32 (Multi-Purpose Canister) is a leak-tight metal canister that has a storage capacity of 32 PWR spent fuel assemblies. The HI-TRAC 125 (Holtec International Transfer Cask) is a metal transfer cask that provides a means to lift and handle the canister as well as providing radiological shielding of the spent fuel assemblies. The HI-STORM (Holtec International Storage and Transfer Operation Reinforced Module) 100S Version B storage overpack is a steel-encased concrete storage cask that provides physical protection and radiological shielding for the metal canister when in storage. The storage cask is vented for natural convection cooling to dissipate the spent fuel decay heat. The casks are stored in a vertical position outdoors on a storage pad at the ISFSI.

Loading the MPC-32 metal canisters with spent fuel assemblies takes place underwater in the FHB Cask Storage Area adjacent to the spent fuel pool. The MPC-32, contained inside the transfer cask, is loaded with spent fuel assemblies utilizing the Spent Fuel Handling Machine, described in Section 9.1 of the WF3 UFSAR. Once the MPC-32 is loaded with spent fuel assemblies, the MPC-32 lid is placed on the canister by means of the FHB cask crane and the transfer cask lift yoke (and the lift yoke extension if used) to which the lid is attached by a metallic wire rope sling and shackle rigging arrangement. Immediately following MPC lid placement, the lift yoke is used to engage the HI-TRAC transfer cask lifting trunnions and move the transfer cask containing the loaded MPC to the Cask Decontamination Area, where the canister is welded shut, drained, dried and backfilled with helium.

Travel of the MPC-32 lid over the canister containing spent fuel loading operations conflicts with current Technical Specification requirements. Technical Specification 3/4.9.7 currently prohibits loads in excess of 2,000 lbs from traveling over irradiated fuel assemblies in the FHB. However, the MPC-32 lid weighs approximately 9,650 lbs. The proposed change to this Technical Specification would permit travel of loads in excess of 2,000 lbs over a transfer cask containing irradiated fuel assemblies to facilitate dry cask storage operations, conditional upon use of a single-failure-proof handling system. The FHB cask crane is being upgraded to meet the single-failure-proof criteria of NUREG 0554 (Reference 7.10) and NUREG 0612 (Reference 7.13), as described in paragraphs which follow.

The transfer cask lift yoke and lift yoke extension lifting devices are required to be designed per ANSI N14.6 (Reference 7.11), as prescribed in the HI-STORM FSAR (Reference 7.3). With regards to lifts involving the HI-TRAC transfer cask, HI-STORM FSAR Section 2.0.3, HI-TRAC Transfer Cask Design Criteria, states: "The lifting trunnions and associated attachments are designed in accordance with the requirements of NUREG-0612 and ANSI N14.6 for nonredundant lifting devices." HI-STORM FSAR Section 2.2.1.2, Handling, states: "Lifting attachments and special lifting devices shall meet the requirements of ANSI N14.6". HI-STORM FSAR Table 8.1.6, HI-STORM 100 System Ancillary Equipment Operational Description, under "HI-TRAC Lift Yoke/Lifting Links", states: "Lift yoke and lifting devices for loaded HI-TRAC handling shall be provided in accordance with ANSI N14.6." Section 8 of the HI-STORM FSAR, "Operating Procedures" describes the procedure for placement of the MPC lid on the loaded MPC, which is done in the spent fuel pool following canister spent fuel loading operations immediately prior to engaging the lift yoke, and lift yoke extension if used, onto the upper trunnions of the transfer cask for lifting the transfer cask to the location where canister sealing operations will be performed (without the need to remove the lifting devices from the spent fuel pool water between canister lid placement and transfer cask lift). When the MPC lid is connected to the lift yoke and the lift yoke extension if used (which are designed to ANSI N14.6 requirements) during travel of the MPC lid over the loaded MPC-32 canister, the rigging (shackles and slings) that connects the lid to the lifting device shall meet the requirements of ASME B30.9 (Reference 7.12) and NUREG-0612 (Reference 7.13). This, in combination with the upgraded FHB crane, provides for a single-failure-proof handling system as identified in Section 9.1.5 of NUREG-0800 (Reference 7.9), "Overhead Heavy Load Handling Systems", discussed in Section 5.0, Regulatory Safety Analysis. This single-failure-proof handling system is also responsive to the reemphasized guidance in Regulatory Issue Summary (RIS) 2005-25 (Reference 7.16), including RIS 2005-25, Supplement 1 (Reference 7.17). Due to the reliability of this handling system, a load drop accident (i.e., drop of the lift yoke, lift yoke extension, and/or MPC lid) is not considered to be a credible event and is not evaluated.

Description of the FHB Cask Crane and Crane Upgrade to Single-Failure-Proof

While this License Amendment Request applies to the proposed changes to Technical Specification 3/4.9.7 to permit a load in excess of 2,000 lbs to travel over irradiated fuel in a transfer cask so as to enable dry cask storage operations, this is only permitted using a single-failure-proof handling system. Although Entergy plans to modify the FHB cask crane under the provisions of 10 CFR 50.59, and the crane upgrade is not the subject of this License Amendment Request, the following discussion is provided for informational purposes regarding the FHB cask crane and how it will be upgraded to comply with single-failure-proof requirements.

The FHB cask crane and its operation are described in Section 9.1 of the WF3 UFSAR (Reference 7.1). The FHB cask crane operates inside the FHB and is designed to handle heavy loads up to its rating of 125 tons. The crane is designated a Seismic Category I structure. The FHB cask crane is a double girder overhead bridge crane controlled by a pendant 4 ft above the operating floor that is suspended from the crane. The crane trolley rides on top of the girders and houses the main hoist, hoist gearing, hoist motors and brakes. All electrical and control equipment is installed on top of the west girder on the east side of the walkway. Under each girder is a 15 ton underhung monorail type auxiliary hoist which is also controlled from the operator's pendant. The FHB cask crane can traverse the entire length of the FHB from east to

west on the runways installed on the north and south side of the FHB. The FHB cask crane is presently used to transfer new nuclear fuel from the Rail Bay on the north side of the FHB to the refueling canal in the center of the FHB using the auxiliary hoists. The original crane was designed and installed by Harnischfeger Corporation, also known as P&H cranes during plant construction.

In order to support the dry cask storage operations, the FHB cask crane, including the main hoist, must be upgraded to a single-failure-proof design so it can safely handle the HI-TRAC 125 transfer cask inside the FHB as specified in the HI-STORM FSAR. The FHB cask crane control system must also be replaced so that the operator has finer control of the main hoist, bridge and trolley movements in order to be more precise with the cask movements. The upgrade, described in the paragraphs which follow, will meet the single-failure-proof criteria of NUREG 0554 (Reference 7.10) and NUREG 0612 (Reference 7.13) as is applicable for the modification of an existing non single-failure-proof crane, and shall include a new replacement single-failure-proof main hoist & trolley designed and qualified in accordance with the appropriate requirements of ASME NOG-1 (Reference 7.14).

Modifications planned to the FHB cask crane to make it single-failure-proof include the following (summary of key changes):

1) Removal of the old trolley and associated equipment – The existing trolley will be removed from the bridge. The existing electrical and control systems that are being superseded will also be removed from the bridge.

2) Installation of the new trolley and electrical system – A new trolley will be installed as well as new electrical systems that are being upgraded. The new trolley will be hoisted up to the existing bridge via a strand jack that will be able to lift the new trolley through the bridge girders, rotate the trolley, and set it down on to the bridge rails.

3) Seismic analysis of new trolley and qualification of existing bridge – The existing bridge which was originally seismically qualified will be assessed for the new trolley, with analysis performed as required to demonstrate that the new trolley and the existing bridge will be adequate to support the Maximum Critical Load (MCL) rating during a seismic event (i.e., the safe shutdown earthquake). The trolley itself will be seismically qualified in order to meet ASME NOG-1 qualification requirements.

4) Integration of existing and new crane control electrical systems – A new crane control system will be installed on the FHB cask crane consisting of new controllers for the new trolley and main hoist, and for the existing bridge. Variable frequency drives (VFD's) will be furnished for the main trolley and bridge, with a flux vector drive (FVD) being provided for the main hoist. The existing underhung auxiliary hoist & auxiliary trolley drives are not being replaced. A new radio and back-up pendant shall include all control functions for the new trolley as well as provide full control of the bridge and auxiliary hoists.

A 4th grounding conductor bar will be installed to provide the crane's electrical system with a dedicated ground to the plant's grounding system to ensure proper operation of the new frequency and vector drives, and to prevent interference with other electrical components of the plant.

5) Field testing to demonstrate proper operation – All functions of the crane will be demonstrated to operate properly through a combination of shop and field testing and will satisfy applicable requirements of NUREG-0612, NUREG-0554, and ASME NOG-1 for a single-failure-proof crane. All interlocks, trolley movements, bridge movements, auxiliary hoists movements, and safety switches (including over speed, over travel, two-blocking prevention, trolley end, and mis-spooling switches) shall be verified to function properly. The new radio and pendant controls, and all emergency stops will be verified to function properly.

6) Modification to existing Owner Manuals – Because the upgraded FHB cask crane will have a new main hoist, main trolley and bridge controls, and be controlled by a new radio controlled system which is laid out differently than the existing pendant, all of the Owner's Operating Procedures will be modified to include new procedures for operator training and operation. Operations and Maintenance manuals will also be revised to provide information required to maintain the crane in good working condition and operate it properly.

Analysis

As noted above, Technical Specification 3/4.9.7 currently prohibits loads in excess of 2,000 lbs from traveling over irradiated fuel assemblies in the FHB. The proposed change to this Technical Specification would permit travel of loads in excess of 2,000 lbs over a transfer cask containing irradiated fuel assemblies to facilitate dry cask storage operations, conditional upon use of a single-failure-proof crane and lifting devices that comply with the applicable requirements of ANSI N14.6 and/or ASME B30.9. Usage of the single-failure proof main lifting hoist of the FHB cask crane and lifting devices that comply with the applicable requirements of ANSI N14.6 and/or ASME B30.9, ensure that the lifting system is sufficiently reliable as to preclude drop of the MPC-32 lid, transfer cask lift yoke or lift yoke extension, and the consequences of such a drop need not be analyzed. Under no conditions will the auxiliary hoists, which are not being upgraded to single-failure-proof, be permitted to travel over irradiated fuel with a heavy load.

The paragraph at the end of Technical Specification 3/4.9.7 is being deleted since it is no longer applicable. This permitted the main hook electrical interlocks to be replaced with administrative controls, and did not require performance of Surveillance 4.9.7.2 that demonstrated the operability of these interlocks, for activities specifically associated with the spent fuel rerack project performed prior to Refueling Outage 9. Since the rerack project has been completed, this paragraph no longer applies and its deletion will have no effect on safe operation of the FHB cask crane.

5.0 REGULATORY SAFETY ANALYSIS

5.1 Applicable Regulatory Requirements/Criteria

General Design Criterion (GDC) 4, "Environmental and Dynamic Effects Design Bases," of Appendix A to 10 CFR Part 50 specifies, in part, that structures, systems, and components important to safety shall be appropriately protected against dynamic effects, including the effects of missiles, that may result from equipment failures. GDC 2, "Design Bases for Protection Against Natural Phenomena," specifies, in part, that structures, systems, and components important to safety shall be designed to withstand the effects of natural phenomena, such as earthquakes. Section 9.1.5 of NUREG-0800 (Reference 7.9), "Overhead

Heavy Load Handling Systems," references the guidelines of NUREG-0612 for implementation of these criteria in the design of overhead heavy load handling systems.

In NUREG-0612 (Reference 7.13), "Control of Heavy Loads at Nuclear Power Plants," the NRC staff provided regulatory guidelines for control of heavy load lifts to assure safe handling of heavy loads in areas where a load drop could impact on stored spent fuel, fuel in the reactor core, or equipment that may be required to achieve safe shutdown or permit continued decay heat removal. Section 5.1.1 of NUREG-0612 provides guidelines for reducing the likelihood of dropping heavy loads and provides criteria for establishing safe load paths; procedures for load handling operations; training of crane operators; design, testing, inspection, and maintenance of cranes and lifting devices; and analyses of the impact of heavy load drops. The guidelines in Sections 5.1.2 through 5.1.6 address alternatives to either further reduce the probability of a load-handling accident or mitigate the consequences of heavy load drops. These alternatives include using a single-failure-proof crane for increased handling system reliability, employing electrical interlocks and mechanical stops for restricting crane travel to safe areas, or performing load drop consequence analyses for assessing the impact of dropped loads on plant safety and operations.

Guidelines for design of single-failure-proof cranes are included in NUREG-0554 (Reference 7.10), "Single-Failure Proof Cranes for Nuclear Power Plants." Appendix C to NUREG-0612 provides alternative guidance for upgrading the reliability of existing cranes to single-failure-proof standards. In Section 9.1.5 of NUREG-0800 (Reference 7.9), the NRC staff recognizes cranes designed to the criteria for Type 1 cranes specified in ASME NOG-1 2004 (Reference 7.14) as acceptable under the guidelines of NUREG-0554 for construction of a single failure-proof crane. Paragraph I.4.C of Section 9.1.5 of NUREG-0800 states the following:

> "The probability for a load drop is minimized by an overhead handling system designed to comply with the guidelines of NUREG-0554 and lifting devices that comply with American National Standards Institute (ANSI) N14.6 or an alternative based on American Society of Mechanical Engineers (ASME) B30.9. An overhead handling system that complies with ASME NOG-1 criteria for Type 1 cranes is an acceptable method for compliance with the NUREG-0554 guidelines."

Paragraph III.4.C of Section 9.1.5 of NUREG-0800 states the following:

> "The likelihood of failure is extremely low due to a single failure-proof handling system. A single failure-proof handling system consists of the following two elements:
>
> i. The crane should be designed to the criteria of NUREG-0554. Cranes designed to the criteria of ASME NOG-1 2004 for a Type 1 crane are acceptable under the guidelines of NUREG-0554 for construction of a single failure-proof crane. Consistent with Paragraph 10 of NUREG-0554, a quality assurance program should cover the procurement, design, fabrication, installation, inspection, testing, and operation of the crane. The program should include at least the following elements: (1) design and procurement document control; (2) instructions, procedures, and drawings; (3) control of purchased material, equipment, and services; (4) inspection; (5) testing and test control; (6) non-conforming items; (7) corrective action; and (8) records.
>
> ii. The lifting devices should be selected to satisfy either of the following criteria:

(1) A special lifting device that satisfies ANSI N14.6 should be used for recurrent load movements in critical areas (reactor head lifting, reactor vessel internals, spent fuel casks). The lifting device should have either dual, independent load paths or a single load path with twice the design safety factor specified by ANSI N14.6 for the load.

(2) Slings should satisfy the criteria of ASME B30.9 and be constructed of metallic material (chain or wire rope). The slings should be either (a) configured to provide dual or redundant load paths or (b) selected to support a load twice the weight of the handled load."

As discussed above, Entergy is in the process of designing changes to the FHB cask crane and will upgrade the crane trolley, including the main hoist assembly, to the ASME NOG-1 criteria in conformance with the single-failure-proof guidelines of NUREG-0612 and NUREG-0554 prior to commencement of dry cask storage operations. The upgraded single-failure-proof handling system will permit removal of the prohibition against handling a heavy load over the transfer cask in the FHB Cask Storage Area, and enable Entergy to perform dry cask storage operations while still providing interlocks to prevent heavy loads traveling over irradiated fuel in the spent fuel pool. Under no conditions will the auxiliary hoists, which are not being upgraded to single-failure-proof, be permitted to travel with heavy loads over irradiated fuel.

5.2 No Significant Hazards Consideration

Entergy has evaluated whether or not a significant hazards consideration is involved with the proposed amendments by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of amendment," as discussed below:

1. Does the proposed change involve a significant increase in the probability or consequences of an accident previously evaluated?

Response: No.

The FHB cask crane will be upgraded to meet the applicable single-failure-proof criteria of NUREG 0554 (Reference 7.10) and NUREG 0612 (Reference 7.13) for the modification of the existing non single-failure-proof crane. Due to the reliability of this upgraded handling system, a load drop accident will not be considered a credible event. While loads in excess of 2000 lbs shall continue to be prohibited from travel over irradiated fuel assemblies in the spent fuel pool by the WF3 Technical Specifications, heavy loads will be permitted to travel over irradiated fuel assemblies in a transfer cask, using a single-failure-proof handling system as described in NUREG-0800 Section 9.1.5 Paragraph III.4.C (Reference 7.9), to enable the conduct of dry cask storage loading/unloading operations. Specifically, this will enable the MPC lid and its associated lifting apparatus to travel over irradiated fuel assemblies in a MPC basket. The probability of dropping a load that weighs in excess of 2000 lbs onto an irradiated fuel assembly is not increased as a result of the reliability of the single-failure-proof handling system.

The proposed change does not affect the consequences of any accidents previously evaluated in the WF3 UFSAR (Reference 7.1). The change involves the travel of heavy loads over irradiated fuel assemblies in a transfer cask using a single-failure-proof handling system. Under

these circumstances, no new load drop accidents are postulated and no changes to the probabilities or consequences of accidents previously evaluated are involved.

2. Does the proposed change create the possibility of a new or different kind of accident from any accident previously evaluated?

Response: No.

Section 9.1 of the WF3 UFSAR evaluates fuel storage and handling operations. Section 15.7.3.4 of the WF3 UFSAR discusses the analysis of design basis fuel handling accidents involving drop of an irradiated assembly resulting in multiple fuel rod failures and consequent release of radioactivity. The change involves the travel of heavy loads over irradiated fuel assemblies in a transfer cask using a single-failure-proof handling system. Under these circumstances, no new or different load drop accidents are postulated to occur and there are no changes in any of the load drop accidents previously evaluated.

3. Does the proposed change involve a significant reduction in a margin of safety?

Response: No.

The revised Technical Specification changes do not involve a reduction in any margin of safety. Technical Specification 3/4.9.7 currently prohibits travel of heavy loads over irradiated fuel assemblies in the FHB. Proposed changes to this specification will continue to restrict FHB cask crane movements so that travel of heavy loads over irradiated fuel assemblies in the FHB are not permitted, with the single exception of heavy loads over irradiated fuel assemblies in a transfer cask, in order to enable dry cask storage operations. This operation is only permitted when the heavy load is handled using a single-failure-proof handling system. Due to the reliability of this upgraded handling system that complies with the guidance of NUREG-0800 Section 9.1.5 Paragraph III.4.C (Reference 7.9) for a single-failure-proof handling system, a load drop accident is not considered a credible event. Under these circumstances, no new load drop accidents are postulated and no reductions in margins of safety are involved.

5.3 Environmental Consideration

A review has determined that the proposed amendment would permit dry cask storage operations by making provisions for loads in excess of 2,000 pounds to travel over irradiated fuel assemblies in a transfer cask using a single-failure-proof handling system. The proposed changes do not involve (i) significant hazards consideration, (ii) any changes in the types or any increase in the amounts of any effluent that may be released offsite, or (iii) significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed amendment meets the eligibility criterion for categorical exclusion set forth in 10 CFR 51.22(c)(9). Therefore, pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment needs to be prepared in connection with the proposed amendment.

6.0 PRECEDENCE

The NRC approved a similar change to Technical Specifications for Kewaunee Power Station, who upgraded their 125 ton Auxiliary Building crane to a single-failure-proof design, in an NRC License Amendment and associated Safety Evaluation Report (SER) dated November 20, 2008 (Reference 7.15). A key difference between this License Amendment Request (LAR) and that of Kewaunee is that the Kewaunee LAR requested transfer of the heavy load travel restrictions out of their Technical Specifications and into their Technical Requirements Manual, in keeping with 10 CFR 50.36 criteria for what is required to be included in Technical Specifications and per the Standard Technical Specifications. This Waterford 3 LAR proposes leaving the heavy load travel restrictions in the Technical Specifications, but revising them to permit dry cask storage operations.

7.0 REFERENCES

7.1. Waterford Steam Electric Station Unit No. 3, Updated Final Safety Analysis Report, Revision 302, December 2008.

7.2. Waterford Steam Electric Station Unit No. 3, Technical Specification.

7.3. Final Safety Analysis Report for the Holtec International Storage and Transfer Operation Reinforced Module Cask System (HI-STORM 100 Cask System), Holtec Report HI-2002444, Docket 72-1014, Revision 7, August 2008.)

7.4. NRC Letter Amendment No. 5 to Certificate of Compliance No. 1014 for the Holtec International Hi-Storm Cask System, July 17, 2008. (ADAMS Accession No. ML082030122)

7.5. NRC Amendment No. 5 Certificate of Compliance No. 1014 for the Holtec International Hi-Storm Cask System, July 14, 2008. (ADAMS Accession No. ML082030158)

7.6. NRC Amendment No. 5 Final Safety Evaluation Report Docket No. 72-1014 Holtec International Hi-Storm 100 Cask System Certificate of Compliance No. 1014, July 14, 2008. (ADAMS Accession No. ML082030170)

7.7. NRC Amendment No. 5 Certificate of Compliance No. 1014 Appendix A Technical Specifications for the Hi-Storm 100 Cask System, July 14, 2008. (ADAMS Accession No. ML082030221)

7.8. NRC Amendment No. 5 Certificate of Compliance No. 1014 Appendix B Approved Contents and Design Features for the Hi-Storm 100 Cask System, July 14, 2008. (ADAMS Accession No. ML082030231)

7.9. NUREG-0800 Section 9.1.5 Rev. 1, Standard Review Plan for Overhead Heavy Load Handling Systems, March 2007. (ADAMS Accession No. ML062260190)

7.10. NUREG-0554, Single-Failure-Proof Cranes for Nuclear Power Plants, U.S. Nuclear Regulatory Commission, May 1979.

7.11. ANSI N14.6, American National Standard for Special Lifting Devices for Shipping Containers Weighing 10,000 Pounds (4500 kg) or More for Nuclear Materials, American National Standards Institute, June 1993.

7.12. ASME B30.9, Slings, American Society of Mechanical Engineers, 2003.

7.13. NUREG-0612, Control of Heavy Loads at Nuclear Power Plants, U.S. Nuclear Regulatory Commission, July 1980. (ADAMS Accession No. ML070250180)

7.14. ASME NOG-1, Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder), American Society of Mechanical Engineers, 2004.

7.15 NRC Amendment Kewaunee Power Station – Issuance of Amendment to Relocate Spent Fuel Pool Crane Requirements from the Technical Specifications to the Technical Requirements Manual, November 20, 2008. (ADAMS Accession No. ML082971079)

7.16 NRC Regulatory Issue Summary 2005-25: Clarification of NRC Guidelines for Control of Heavy Loads, October 31, 2005. (ADAMS Accession No. ML052340485)

7.17 NRC Regulatory Issue Summary 2005-25, Supplement 1, Clarification of NRC Guidelines for Control of Heavy Loads, May 29, 2007. (ADAMS Accession No. ML071210434)

Attachment 2

W3F1-2009-0046

Proposed Technical Specification Changes (mark-up)

REFUELING OPERATIONS

3/4.9.7 CRANE TRAVEL - FUEL HANDLING BUILDING

LIMITING CONDITION FOR OPERATION

3.9.7 Cranes in the fuel handling building shall be restricted as follows:

a. The spent fuel handling machine shall be used* for the movement of fuel assemblies (with or without CEAs) and shall be OPERABLE with:

1. A minimum hoist capacity of 1800 pounds, and

2. An overload cutoff limit of less than or equal to 1900 pounds, and,

b. Loads in excess of 2000 pounds shall be prohibited from travel over irradiated fuel assemblies in the Fuel Handling Building, except over assemblies in a transfer cask using a single-failure-proof handling system.

APPLICABILITY: During movement of irradiated fuel assemblies in the fuel handling building, or with irradiated fuel assemblies in the Fuel Handling Building.

ACTION:

a. With the spent fuel handling machine inoperable, suspend the use of the spent fuel handling machine for movement of fuel assemblies and place the crane load in a safe position.

b. With loads in excess of 2000 pounds over irradiated fuel assemblies in the Fuel Handling Building, place the crane load in a safe position.

, except over assemblies in a transfer cask using a single-failure-proof handling system,

c. The provisions of Specification 3.0.4 are not applicable.

SURVEILLANCE REQUIREMENTS

4.9.7.1 The spent fuel handling machine shall be demonstrated OPERABLE within 72 hours prior to the start of fuel assembly movement and at least once per 7 days thereafter by performing a load test of at least 1800 pounds and demonstrating the automatic load cutoff when the hoist load exceeds 1900 pounds.

, except over assemblies in a transfer cask using a single-failure-proof handling system,

4.9.7.2 The electrical interlock system which prevents crane main hook travel over irradiated fuel assemblies in the Fuel Handling Building shall be demonstrated OPERABLE within 7 days prior to crane use and at least once per 7 days thereafter during crane operation.#

4.9.7.3 Administrative controls which prevent crane auxiliary hook travel with loads in excess of 2000 pounds over the irradiated fuel assemblies in the Fuel Handling Building shall be enforced during crane operations.

, including over assemblies in a transfer cask,

*Not required for movement of new fuel assemblies outside the spent fuel pool and Cask Storage Pit.

delete → #The crane main hook electrical interlocks may be replaced with administrative controls for activities associated with the implementation of the spent fuel rerack project being performed prior to Refueling Outage 9. While these administrative controls are in place, the performance of SR 4.9.7.2 is not required.

Attachment 3

W3F1-2009-0046

Changes to Technical Specification Bases Pages – For Information Only

, except over assemblies in a transfer cask using a single-failure-proof handling system,

REFUELING OPERATIONS

BASES

3/4.9.7 CRANE TRAVEL - FUEL HANDLING BUILDING

The restriction on movement of loads in excess of the nominal weight of a fuel assembly, CEA, and associated handling tool over other irradiated fuel assemblies in the Fuel Handling Building ensures that in the event this load is dropped (1) the activity release will be limited to that contained in a single fuel assembly, and (2) any possible distortion of fuel in the storage racks will not result in a critical array. This assumption is consistent with the activity release assumed in the safety analyses. (Insert A)

3/4.9.8 SHUTDOWN COOLING AND COOLANT CIRCULATION

• (DRN 03-375, Ch. 19)

The requirement that at least one shutdown cooling train be in operation ensures that (1) sufficient cooling capacity is available to remove decay heat and maintain the water in the reactor pressure vessel below 140°F as required during the REFUELING MODE, and (2) sufficient coolant circulation is maintained through the reactor core to minimize the effects of a boron dilution incident and prevent boron stratification. If SDC loop requirements are not met, there will be no forced circulation to provide mixing to establish uniform boron concentrations. Suspending positive reactivity additions that could result in failure to meet the minimum boron concentration limit is required to assure continued safe operation. Introduction of coolant inventory must be from sources that have a boron concentration greater than that which would be required in the RCS for minimum refueling boron concentration. This may result in an overall reduction in RCS boron concentration, but provides acceptable margin to maintaining subcritical operations.

• (DRN 03-375, Ch. 19)

The requirement to have two shutdown cooling trains OPERABLE when there is less than 23 feet of water above the top of the fuel seated in the reactor pressure vessel ensures that a single failure of the operating shutdown cooling train will not result in a complete loss of decay heat removal capability. When there is no irradiated fuel in the reactor pressure vessel, this is not a consideration and only one shutdown cooling train is required to be OPERABLE. With the reactor vessel head removed and 23 feet of water above the top of the fuel seated in the reactor pressure vessel, a large heat sink is available for core cooling, thus in the event of a failure of the operating shutdown cooling train, adequate time is provided to initiate emergency procedures to cool the core.

3/4.9.9 CONTAINMENT PURGE VALVE ISOLATION SYSTEM

The OPERABILITY of this system ensures that the containment purge valves will be automatically isolated upon detection of high radiation levels within the containment. The OPERABILITY of this system is required to restrict the release of radioactive material from the containment atmosphere to the environment.

Insert A

Movements of loads using a single failure proof handling system, consisting of a crane that has been upgraded to meet the single-failure-proof criteria of NUREG 0554 and NUREG 0612, and lifting devices that meet the requirements of ANSI N14.6 or ASME B30.9, do not require the assumption of a dropped load, and activity releases assumed in the safety analysis are not affected.