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10 CFR 50.90

NL-20-021

March 24, 2020

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

Subject: Proposed License Amendment to Revise the Indian Point Nuclear Generating Unit No. 3 Licensing Basis to Incorporate the Installation and Use of a New Auxiliary Lifting Device

Indian Point Nuclear Generating Unit No. 3
NRC Docket No. 50-286
Renewed Facility Operating License No. DPR-64

In accordance with 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," Entergy Nuclear Operations, Inc. (Entergy) is submitting an application for an amendment to Renewed Facility Operating License (FOL) DPR-64 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed amendment requests U.S. Nuclear Regulatory Commission (NRC) approval to incorporate, into the IP3 Licensing Basis, the installation and use of a new single failure proof auxiliary lifting device (i.e., the Holtec International (Holtec) HI-LIFT) to handle a dry cask storage (DCS) transfer cask (i.e., the HI-TRAC) in the IP3 Fuel Storage Building (FSB). The change to the IP3 licensing basis will be documented in a change to the IP3 Updated Final Safety Analysis Report (UFSAR).

The existing IP3 40-ton FSB Crane does not have the capacity to lift a fully loaded HI-TRAC (i.e., containing a multi-purpose canister (MPC-32) with 32 spent fuel bundles). Due to this limitation, DCS loading at IP3 involves moving spent fuel from the IP3 FSB to the Indian Point Nuclear Generating Unit No. 2 (IP2) FSB using a wet transfer method.

Installation of the HI-LIFT will eliminate the need to perform the wet transfer between IP3 and IP2. Installation and use of the HI-LIFT at IP3 does not involve a change to the Technical Specifications (TSs).

The Enclosure to this letter provides a description and assessment of the proposed changes to the IP3 licensing basis and UFSAR.

- Attachment 1 provides the HI-LIFT Design and Installation Figures
- Attachment 2 provides Proprietary Holtec Report HI-2188549, "HI-LIFT Design Specification for IPEC Unit 3"
- Attachment 3 provides Proprietary HI-LIFT Licensing Drawing, 11654R1
- Attachment 4 provides Proprietary Holtec Report HI-2188625, "Structural Evaluation of HI-LIFT Device and Fuel Storage Building Walls at Indian Point Unit 3"
- Attachment 5 provides IP3 UFSAR changed pages
- Attachment 6 provides Holtec Affidavit Pursuant to 10 CFR 2.390, dated March 5, 2020

Since Attachments 2, 3, and 4, in their entirety, contain information proprietary to Holtec, these are supported by an affidavit signed by Holtec, the owner of the information, which is provided in Attachment 6. The affidavit sets forth the basis on which the attachments may be withheld from public disclosure by the NRC and addresses, with specificity, the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

Entergy requests approval of the proposed license amendment by April 26, 2021. The proposed changes would be implemented within 90 days of issuance of the amendment.

There are no regulatory commitments contained in this request.

In accordance with 10 CFR 50.91, Entergy is notifying the State of New York of this license amendment request, by transmitting a copy of this letter and enclosure to the designated State Official.

If there are any questions or if additional information is needed, please contact Ms. Mahvash Mirzai, IP2 and IP3 Regulatory Assurance Manager, at (914) 254-7714.

I declare under penalty of perjury that the foregoing is true and correct.

Executed on the 24th day of March 2020.

Respectfully,

Ron Gaston

RWG/jls

Enclosure: Evaluation of the Proposed Change

Attachments to Enclosure:

1. HI-LIFT Design and Installation Figures
2. Holtec Report HI-2188549, "HI-LIFT Design Specification for IPEC Unit 3," Proprietary
3. HI-LIFT Licensing Drawing, 11654R1, Proprietary
4. Holtec Report HI-2188625, "Structural Evaluation of HI-LIFT Device and Fuel Storage Building Walls at Indian Point Unit 3," Proprietary
5. Indian Point Nuclear Generating Unit No. 3 UFSAR changed pages
6. Holtec Affidavit Pursuant to 10 CFR 2.390, dated March 5, 2020

cc: NRC Region I Regional Administrator
NRC Senior Resident Inspector, Indian Point Nuclear Generating Unit Nos. 2 and 3
NRC Senior Project Manager, NRC/NRR/DORL
President and CEO, NYSERDA
New York State Public Service Commission
NYS Department of Health - Radiation Control Program
NYS Emergency Management Agency

Enclosure

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Evaluation of the Proposed Change

1.0 SUMMARY DESCRIPTION

In accordance with 10 CFR 50.90, "Application for Amendment of License, Construction Permit, or Early Site Permit," Entergy Nuclear Operations, Inc. (Entergy) is submitting an application for an amendment to Renewed Facility Operating License (FOL) DPR-64 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed amendment requests U.S. Nuclear Regulatory Commission (NRC) approval to incorporate, into the IP3 Licensing Basis, the installation and use of a new single failure proof auxiliary lifting device (i.e., the Holtec International (Holtec) HI-LIFT) to handle a dry cask storage (DCS) transfer cask (i.e., the HI-TRAC) in the IP3 Fuel Storage Building (FSB). The change to the IP3 licensing basis will be documented in a proposed change to the IP3 Updated Final Safety Analysis Report (UFSAR).

2.0 DETAILED DESCRIPTION

The existing IP3 40-ton FSB Crane does not have the capacity to lift a fully loaded HI-TRAC (i.e., containing a multi-purpose canister (MPC-32) with 32 spent fuel bundles). Due to this limitation, DCS loading at IP3 involves moving spent fuel from the IP3 FSB to the Indian Point Nuclear Generating Unit No. 2 (IP2) FSB using a wet transfer method. Installation of the HI-LIFT will eliminate the need to perform the wet transfer between IP3 and IP2. Installation and use of the HI-LIFT at IP3 does not involve a change to the Technical Specifications (TSs). The wet transfer loading method, as currently approved for IP2 and IP3 in Appendix C to the IP2 and IP3 FOLs, will remain available in the event it is needed in the future.

The HI-LIFT design, installation, testing, and operation will comply with the guidance provided in NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," American Society of Mechanical Engineers (ASME) NOG-1 2004 edition (ASME NOG-1), "Rules for Construction of Overhead and Gantry Cranes," NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," and General Design Criterion 2, "Design Bases for Protection Against Natural Phenomena." Attachment 1 provides illustrative figures depicting the design and installation of the HI-LIFT, which are referenced below, where appropriate. All figures referenced in this Enclosure are provided in Attachment 1.

Handling of the unloaded and loaded HI-TRAC transfer cask in the IP3 FSB will be accomplished in accordance with the requirements of NUREG-0612, through implementation of the HI-LIFT as a single-failure proof lifting device. As stated in ASME NOG-1, a single-failure proof device is one in which "…any credible failure of a single component will not result in the loss of capability to stop and hold the critical load within facility acceptable excursion limits." The HI-LIFT will meet the requirements for a single-failure proof lifting device, as delineated in NUREG-0554, through compliance with ASME NOG-1. NUREG-0800, Section 9.1.5, "Overhead Heavy Load Handling Systems," documents the NRC's endorsement of ASME NOG-1 as an acceptable means of satisfying the guidelines of NUREG-0554. In addition, the HI-LIFT will comply with the general inspection and maintenance requirements of NUREG-0612 Section 5.1.1 through compliance with the inspection and maintenance requirements of ASME B30.2, "Overhead and Gantry Cranes," Chapter 2-2.

Attachment 2, Holtec report HI-2188549, "HI-LIFT Design Specification for IPEC Unit 3," includes detailed matrices outlining compliance of the HI-LIFT with ASME NOG-1 criteria (Appendix A of the report), NUREG-0612 guidelines (Appendix B), NUREG-0554 guidelines (Appendix C), and ASME B30.2, Section 2-2 requirements (Appendix D). Appendix E of Attachment 2 provides a

component compliance matrix which categorizes the major components of the HI-LIFT as structural or mechanical, the safety case for single-failure proof acceptance of each major component, and the relevant design section of ASME NOG-1.

Attachment 3 provides a detailed licensing drawing of the HI-LIFT. Attachment 4 provides Holtec report HI-2188625, "Structural Evaluation of HI-LIFT Device and Fuel Storage Building Walls at Indian Point Unit 3." Attachment 5 provides proposed changes to the IP3 UFSAR which would incorporate the HI-LIFT into the IP3 licensing basis.

Since Attachments 2, 3, and 4, in their entirety, contain information proprietary to Holtec, these are supported by an affidavit signed by Holtec, the owner of the information, which is provided in Attachment 6. The affidavit sets forth the basis on which the attachments may be withheld from public disclosure by the NRC and addresses, with specificity, the considerations listed in paragraph (b)(4) of Section 2.390 of the Commission's regulations.

2.1 System Design and Operation

2.1.1 HI-LIFT

The HI-LIFT is a wall-mounted lifting device rated for 100 tons. As designed, the HI-LIFT will comply with the single-failure-proof criteria of NUREG-0554 and NUREG-0612, through compliance with ASME NOG-1. The HI-LIFT will only handle the HI-TRAC and MPC-32 units within the IP3 FSB. The HI-LIFT is comprised of a U-shaped frame, strand jack lifting device, hydraulic positioning cylinders, torque arms and stabilizing arm. Attachment 1, Figure 1 illustrates the HI-LIFT design. The HI-LIFT is designed to meet all applicable requirements of ASME NOG-1, 2004, thus ensuring the safety of the device during operations.

2.1.2 Strand Jack

The HI-LIFT will provide the hoisting capabilities required for DCS loading in the IP3 FSB, utilizing a Strand Jack to lift and lower the load. The Strand Jack is a commercial component used worldwide in the construction industry with proven reliability. The HI-LIFT Strand Jack is used to support the weight of the load and provides the means to raise and lower the load. The HI-LIFT Strand Jack uses a bundle of 48 parallel steel strands to support the HI-TRAC and lift yoke. A strand management system (i.e., recoiler), maintains control of the strands as the load is raised and lowered. The Strand Jack uses two sets of wedge locks and a reciprocating hydraulic cylinder to lift and lower the load. While the load is raised, the upper wedge lock set holds the load in place until the load is taken by the lower wedge lock set. The reverse occurs during load lowering. Strand Jack wedges are only used to impose static friction, and do not provide dynamic energy dissipation equivalent to the mechanical load brake as described under Section 5414.2 of NOG-1. The Strand Jack bundle is designed to meet the requirements of NOG-1 5425.1.(b).2 and the Maximum Critical Load (MCL) does not exceed 10 percent of the total break strength of the strand bundle. The load is shared among all strands and wedges such that the failure of one strand or one wedge does not result in any significant loss of load capacity. Attachment 1, Figure 2 illustrates the Strand Jack and main components. Figure 3 illustrates the wedge lock design.

2.1.3 HI-LIFT Frame

The Strand Jack is supported by a Center Beam that transfers the load outwards to two Support Arms, forming an inverted U-shaped frame. The U-frame is supported with a pinned connection to steel base frames (Mounting Feet) mounted to the top surface of the structural concrete pool wall. Pivoting the U-frame about the bottom pins provides a translation motion with a range sufficient to reach a canister processing location (i.e., a "washdown area") adjacent to the truck bay, and a cask loading position in the spent fuel pool (SFP). Support Arm motion is powered by hydraulic cylinders, which react against two Torque Arms. The Torque Arms are supported by the SFP wall and brackets mounted to the south wall of the truck bay. The attachment to the south truck bay wall provides a means of supporting cylinder loads. An additional Outrigger Arm provides stability and bracing for loading, perpendicular to the direction of load translation occurring only during a seismic condition. The outrigger arm by design is not intended to provide stability or bracing for loading in any other direction or configurations. Attachment 1, Figure 4 illustrates the HI-LIFT frame.

Translational motion is provided by the HI-LIFT frame and Support Arms. The HI-LIFT frame moves the Strand Jack unit horizontally by pivoting through a defined travel path via the bottom pins attached to the Support Arms. The travel path encompasses the truck bay washdown area and the cask loading area of the SFP. The length of the Support Arms limits the travel path of the HI-LIFT, and prevents cask movement over spent fuel stored in the SFP racks.

2.1.4 HI-LIFT Installation

The HI-LIFT frame will be mounted to the top surface of the SFP wall, adjacent to the cask-loading pit. The Torque Arms will be anchored to the FSB wall directly across from the SFP wall (i.e., the south truck bay wall). Mounting and anchoring details are depicted in the Attachment 3 licensing drawing. The HI-LIFT will be supported entirely by the six-foot thick south SFP wall. Essentially all loads from the Torque Arms on the south truck bay wall will be limited to vertical reactions, through the use of a roller system. Attachment 1, Figure 5 illustrates the HI-LIFT as installed at IP3. Illustration of the roller system can be seen in Attachment 1, Figure 6. The minor frictional forces in the roller system that cause small horizontal reactions are acknowledged in the Attachment 4 structural analysis.

There is no reliance on the strength of the columns and overhead structures in the FSB, nor is there physical attachment to the FSB floor. The anchor system connects the mechanical and steel structural portions of the HI-LIFT frame to the reinforced concrete structure of the FSB. Steel baseplates are machined to match the actual locations of the field-installed concrete anchors on the SFP wall, leveled, and grouted in place. These baseplates provide threaded holes for attachment of the primary lifting device subcomponents. Attachment to the truck bay wall is made by through drilling, using studs, with washers and nuts.

2.1.5 HI-LIFT Control

An electrically driven hydraulic power unit is located in a separate area to power the hydraulic action of the Strand Jack and hydraulic cylinders. An operator control station allows control of the unit, monitoring of the lift, and includes alarming and indication functions for operators. The control system complies with ASME NOG-1 criteria, as described in Attachment 2, Appendix A.

2.1.6 HI-LIFT Maintenance Position

When installed for lifting, the HI-LIFT will interfere with the travel path of the existing 40-ton overhead crane. When necessary to operate the overhead crane with the HI-LIFT installed, the HI-LIFT will be placed in a maintenance position. The maintenance position allows the HI-LIFT to pivot further over the truck bay, removing the interference with the overhead crane travel path. Use of the HI-LIFT maintenance position will be procedurally controlled, and only used when the HI-LIFT hoist is empty. The HI-LIFT will not handle a cask or other equipment in the maintenance position. To place the HI-LIFT into the maintenance position, the stop plates must be lifted and disengaged from the torque arms, then the cylinder slide mounts are translated along the torque arms. Hydraulic cylinders are included to lift the stop plates, and additional hydraulic cylinders are used to translate the cylinder slide mounts. These auxiliary hydraulic cylinders will be disconnected from power sources during normal use of HI-LIFT. Note that the final design may utilize other mechanisms, such as acme screw devices, in lieu of auxiliary hydraulic cylinders. Attachment 1, Figure 7 depicts the HI-LIFT lowered into the in the maintenance position.

2.1.7 HI-LIFT Seismic Switch

A Seismic Switch is installed at the 55-foot elevation in the FSB Truck Bay to comply with the ASME NOG-1-2004, Section 6120, "Seismic Considerations (Type I, II, and III Cranes)" requirement. Section 6120 requires installation of equipment to de-energize the power supply in the event of a Safe Shutdown Earthquake (SSE). The Seismic Switch contains a relay that operates when its accelerometers detect motion greater than the SSE. This relay will be used to disconnect the hydraulic power supply controlling the HI-LIFT motion.

2.1.8 HI-LIFT Functions

The HI-LIFT must be capable of the following operations:

- Connect to a suitable lift yoke, which engages with the lifting trunnions of a HI-TRAC, while the HI-TRAC is loaded with an empty or loaded MPC-32 canister and placed in position at ground level in the truck bay washdown area.
- Lift the HI-TRAC from the truck bay washdown area of the IP3 FSB to a height sufficient to clear the wall and curb on the south side of the IP3 SFP wall.
- Translate the HI-TRAC northwards, over the SFP.
- Lower the empty HI-TRAC into the SFP in a slow and controlled manner.
- Lift the loaded HI-TRAC out of the SFP, translate, and lower the HI-TRAC to the wash-down area in a slow and controlled manner.
- Disengage from the HI-TRAC and retreat clear of subsequent loading activities.

2.1.9 HI-LIFT and Strand Jack Safety Attribute Summary

All structural steel used in the HI-LIFT is designed to meet the requirements of the structural steel design and stress limits of ASME NOG-1.

The hydraulic cylinders and hydraulic system, which provide lateral movement of the HI-LIFT, will include specific features for control and use and to ensure high reliability. A system will be used for controlled fluid metering to ensure that the cylinders operate in unison, and position controls will be utilized to monitor and adjust the cylinder travel as necessary. In addition, each cylinder is equipped with counter-balance valves that "lock up" the cylinder in the event of a hydraulic failure or pump malfunction, or cessation of flow resulting from an emergency stop application, limit switch activation, or seismic switch activation. All components will also be selected with rated operating pressures that exceed all normal and extreme operating conditions. In combination, these features ensure safe controlled motion in the lateral direction. An illustration of the counter-balance schematic can be found in Attachment 1, Figure 8. The counter-balance system, as installed on a double-acting hydraulic cylinder is depicted in Attachment 1, Figure 9.

The Strand Jack, which supports the weight of the HI-TRAC and lift yoke, is equipped with multiple safety features. The strand jack control system is equipped with redundant limit switches that limit the upward movement of the HI-TRAC. Two blocking protection is provided by a limit switch that interfaces with programmable logic controller (PLC) controls, and a second independent limit switch which removes power from the hydraulic power unit. Features of the PLC-based control system will stop upward motion when either the limit switch or pressure trip setpoint is reached. In addition, hydraulic pressure in the Strand Jack is regulated to limit the upward force that can be exerted in the event of a load hang-up. The Strand Jack has a rated minimum capacity of twice the MCL. The break strength of the bundle strands is greater than ten times the MCL.

2.2 Current Licensing Basis

The general controlling standard for the design, installation and testing of the 40-ton FSB Fuel cask crane is ASME NOG-1-2004, as described in the IP3 UFSAR (Reference 1), Section 9.5.1.
The HI-LIFT is designed to satisfy this standard.

2.3 Reason for the Proposed Change

The existing 40-ton Crane in the IP3 FSB does not have the capacity to lift a HI-TRAC transfer cask containing a fully loaded MPC-32 (i.e., approximately 97 tons). Due to this limitation, Entergy submitted an IP2 and IP3 license amendment request (LAR) in 2009 (ADAMS Accession No. ML091940177) to implement the inter-unit transfer of spent fuel from the IP3 SFP to the IP2 SFP using the Holtec Shielded Transfer Canister (STC). The NRC approved the IP2 and IP3 license amendments in 2012 (ADAMS Accession No. ML121230011). Since approval of the 2012 license amendments, Entergy has utilized the STC as an intermediate step to shuttle a maximum of 12 spent fuel assemblies at a time from the IP3 SFP to the IP2 SFP. The assemblies are then loaded into the MPC-32 canisters from the IP2 spent fuel pool, and the IP2 110-ton crane is used to lift the loaded MPC-32 canisters, within the HI-TRAC transfer cask, out of the IP2 SFP for processing and storage.

To reduce the number of fuel movements associated with loading IP3 fuel into dry cask storage, and to avoid the intermediate shuttle operation with the STC, Entergy proposes to install a new single failure proof auxiliary lifting device in the IP3 FSB. The HI-LIFT is an auxiliary lifting device capable of

delivering full size dry storage casks into the IP3 spent fuel pool and then retrieving the loaded casks and delivering them to a transport vehicle.

The proposed amendment requests NRC approval to incorporate, into the IP3 Licensing Basis, the installation and use of a new single failure proof auxiliary lifting device (i.e., the HI-LIFT) to handle the HI-TRAC transfer cask, in both a loaded and unloaded condition, in the IP3 FSB.

2.4 Description of the Proposed Change

The IP3 UFSAR will be revised to include a description of the HI-LIFT auxiliary lifting device design, installation, and operation. The HI-LIFT meets the single-failure-proof criteria of NUREG-0554 and NUREG-0612, through compliance with ASME NOG-1. Attachment 5 provides the IP3 UFSAR pages, marked up to show the proposed changes.

3.0 TECHNICAL EVALUATION

General

The structural analysis of the HI-LIFT, and its interfaces with supporting walls, is provided in Attachment 4, and summarized below. All design criteria, load and loading combinations, the analytical methodology, and the acceptance criteria for the analytical results, relate to the design, installation, and use of the HI-LIFT at IP3, and the supporting walls. Based on the analyses presented in Attachment 4, the HI-LIFT device and the supporting wall structures are structurally acceptable for its intended use.

3.1 Structural Analysis Summary

3.1.1 HI-LIFT Structural Evaluation

The structural evaluation of the HI-LIFT was performed using the finite element method to calculate normal beam stresses in the structural members for all load cases, in accordance with ASME NOG-1. The HI-LIFT was designed to satisfy the stress limits of ASME NOG-1 under normal and seismic conditions. Specifically, all safety factors for the HI-LIFT, under both normal and seismic conditions must be above 1.0. Safety factors for mechanical components of the HI-LIFT have been increased to render failure non-credible in accordance with ASME NOG-1 and NUREG-0554. A component compliance matrix which categorizes the major components of the HI-LIFT as structural or mechanical, the safety case for single-failure proof acceptance of each major component, and the relevant design section of ASME NOG-1 is provided in Attachment 2, Appendix E.

Three bounding load orientations for the HI-LIFT have been analyzed. Case A is when the HI-LIFT Support Arms are perpendicular to the floor, Case B is when the HI-LIFT is holding a loaded cask and the hydraulic cylinder is completely closed (i.e., the HI-LIFT with loaded cask is over the truck bay), and Case C is when the hydraulic cylinder is fully extended and the HI-LIFT is holding a fully loaded cask over the SFP. Case A causes maximum buckling stress. Case B and Case C cause maximum bending stress on the vertical beam. The details of the structural evaluation of HI-LIFT, including methodology, assumptions, acceptance criteria and results are described in Attachment 4. All the evaluated safety factors are greater than 1.0, thus qualifying the HI-LIFT device, FSB walls, and the anchoring system as structurally acceptable under all applicable load combinations. Additionally, all safety factors for the mechanical components of the HI-LIFT device are greater than 2.0 under the normal load case to render failure non-credible. The calculated safety factors for the HI-LIFT are

summarized in Tables 3.0 and 4.0 of Attachment 4 and highlighted in the Appendices of Attachment 4. Based on the analyses presented in Attachment 4, the HI-LIFT device is structurally acceptable for its intended use.

3.1.2 SFP Wall and Truck Bay Wall Structural Evaluation

The applicable design code for the building walls at IP3 is American Concrete Institute (ACI) 318-63, "Building code requirements for reinforced concrete." The HI-LIFT is supported entirely on the robust south SFP wall and balanced by imparting reactions into the south truck bay wall of the FSB. Essentially, all of the reaction force imparted into the south truck bay wall is vertical. The minor frictional forces in the roller system, that cause small horizontal reactions, are acknowledged in the structural analysis. There is no reliance on the strength of the columns and overhead structures in the FSB. The loads from the weight of the cask are reacted by forces that act on the FSB and SFP walls. There is no physical attachment to the FSB floor.

The pinned connection between the torque arm and the mounting plate at the top of the SFP wall reacts any horizontal forces in the torque arm. The torque arm attachment to the truck bay wall is accomplished through a captive roller bearing assembly. The roller pin is supported on the flat horizontal plates of the mounting bracket attached to the truck bay wall using through bolts. These two design elements inherently prevent horizontal loads of any significance at this support point.

The structural analysis demonstrates that the SFP wall and the truck bay wall are structurally acceptable per ACI 318-63 to support the loads imparted by HI-LIFT. The building walls were evaluated under the three load orientations, Case A, Case B and Case C, to withstand the bounding loads imparted by the HI-LIFT. In addition to the loads from HI-LIFT, the SFP wall also includes the hydrostatic pressure and hydro dynamic loads, as applicable. The concrete anchor system was evaluated per ACI code guidance. The details of the structural evaluation of the SFP wall and truck bay wall, including methodology, assumptions, acceptance criteria and results are described in Attachment 4. The calculated safety factors for the SFP wall and truck bay wall are listed in Table 5.0 of Attachment 4.

3.1.3 Anchor Point Selection and Evaluation

Anchor locations on the top of the SFP wall and through the truck bay wall will be selected using the as-built condition of the walls. Scans will be performed of the top surface to identify rebar locations where possible. Exploratory drilling will be performed to verify clear locations of concrete where anchors may be installed. Existing rebar will not be cut or drilled through unless it can be positively demonstrated that the rebar is not reinforcement rebar that ensures the structural integrity of the wall. Exploratory drilling does not impact wall integrity, provided no rebar is damaged/removed, as clear cover above the installed rebar cage holds no structural significance. Drilled holes that impact rebar, but do not cut or drill through the rebar may be filled with grout or concrete with no structural impact. Once a valid anchor pattern and a sufficient number of anchors have been located, this as-built condition is then analyzed according to the methods described above to verify that the structural capacity of the as-built anchors is sufficient to maintain the safety of the HI-LIFT, and that the structural evaluations of the SFP and truck bay walls are still valid.

3.2 Heavy loads Requirements

The HI-LIFT is designed to meet the single-failure-proof criteria of NUREG-0554 and NUREG 0612, Section 5.1.1, through compliance with ASME NOG-1. Attachment 2 includes detailed matrices outlining compliance of the HI-LIFT with ASME NOG-1 criteria (Appendix A), NUREG-0612 guidelines (Appendix B), and NUREG-0554 guidelines (Appendix C).

3.3 Seismic Analysis Summary

The seismic evaluations of the HI-LIFT, the SFP wall, and the truck bay wall were performed using the applicable codes listed in the IP3 UFSAR, Sections 2.8.1, "Background and Seismic Design Bases," and Section 9.5, "Fuel Handing System." All safety factors for the SFP wall, truck bay wall, and anchors, under normal and seismic conditions, must be above 1.0. The HI-LIFT meets the seismic criteria of ASME NOG-1. The SFP wall and the truck bay wall meet the requirements of ACI 318-63. The details of the seismic evaluation of the HI-LIFT, the SFP wall, and the truck bay wall are described in Attachment 4. All calculated safety factors are greater 1.0, thus qualifying HI-LIFT, the SFP wall, the truck bay wall, and the anchoring system as structurally acceptable under all applicable load combinations.

The HI-LIFT design also includes the use of an outrigger arm connected directly in line with the Support Beam mounting pin. The primary purpose of the outrigger arm is to provide stability and bracing for loading perpendicular to the direction of HI-LIFT's translation, during an earthquake condition. The outrigger arm by design is not intended to provide stability or bracing for loading in any other direction or configurations. The design of HI-LIFT consists of only one stabilizing arm due to the geometric/locational constraints in the IP3 FSB. The Attachment 4 analysis demonstrates that the design is structurally acceptable to support the loads applied with a single outrigger arm installed.

3.4 Maintenance

The HI-LIFT complies with all of the general inspection and maintenance requirements of NUREG-0612, Section 5.1.1, through compliance with the inspection and maintenance requirements of ASME B30.2, Chapter 2-2. Installation, operation, and load testing will be performed in accordance with NOG-1 Section 7000. Attachment 2, Appendix D provides a compliance matrix with ASME B30.2 Chapter 2-2 requirements.

3.5 Testing

Testing will be performed at the factory, as well as post installation at IP3. Factory testing will conform with applicable NOG-1 requirements. The factory functional test will operate the HI-LIFT through its full range of motion with a minimum load of 125 percent of MCL (125 tons). Following factory load testing, non-destructive testing (i.e., VT and MT/PT) will be performed on all accessible load bearing welds in accordance with NOG-1 requirements (i.e., as described in Attachment 2, Appendix A).

After installation, the testing at IP3 will be in accordance with NOG-1 requirements, including no-load, full-load and rated load tests. The rated load test will operate the HI-LIFT with a load at a minimum load of 125 percent of MCL (125 tons). During installation, each embedded anchor will be load tested after installation using a hydraulic tensioner. Any components, that cannot be factory tested, such as grouted baseplates, will be subjected to additional NDE. The complete HI-LIFT will be load tested in the exact configuration that will be used to lift the loaded HI-TRAC.

In the event, that the Strand Jack is removed for repair or replacement, it can be independently load tested off-site and re-installed on the HI-LIFT top beam. In operation, the Strand Jack only performs straight line lifts, and bears the load directly into the top beam. After a Strand Jack swap-out, all members of HI-LIFT will still have been load tested.

3.6 Accident and Event Summary

3.6.1 UFSAR Chapter 15 Accidents

The existing Fuel Cask Drop accident, Loss of Spent Fuel Pool cooling or inventory accident, and the Accidental Release of Waste Liquid accident, as presently described in the UFSAR, are not affected by the addition or operation of the HI-LIFT. The HI-LIFT is designed to meet the single-failure proof criteria of NUREG-0554 and NUREG-0612, through compliance with ASME NOG-1, rendering cask drops as non-credible. Since cask drops using HI-LIFT are precluded, considerations of the cask falling and damaging the SFP or SFP liner are also precluded. Although non-credible, the cask drop analysis provided in the HI-STORM 100 FSAR demonstrates leak-tight containment of the HI-TRAC contents.

3.6.2 Failure Modes Analysis

An analysis of potential HI-LIFT failure modes is described in Attachment 2, Section 7.0. Specifically, the following failure modes are analyzed: Inoperable Strand Jack, Strand Jack Strand/Wedge Failure, Inoperable Swing Cylinder, Control Unit Failure, Hydraulic Power Unit Failure, Two Blocking Protection, Operational Errors and Mishandling Events, and Support System Malfunctions. Additional discussion concerning Two Blocking Protection and Inoperable Swing Cylinder is provided below in Sections 3.6.4 and 3.6.5, respectively.

3.6.3 Natural Phenomena

Seismic

The structural design criteria and the analyses methodology that demonstrate compliance with seismic activity criteria for HI-LIFT are discussed in Attachment 4.

Tornado

All fuel handling activities using the HI-LIFT will be conducted within the IP3 FSB. Similar to the existing overhead 40 Ton crane inside the IP3 FSB, the HI-LIFT is not analyzed for a tornado missile impact since the probability of such an impact event occurring while the HI-LIFT is carrying a load is extremely low and considered to be non-credible.

3.6.4 Two Blocking

Redundant systems will provide protection against two blocking of the Strand Jack system. The PLC software monitoring the position of the block will trigger a full up position and stop the hoist during normal conditions. This protection exceeds ASME NOG-1 requirements. Should this fail to occur, an independent limit switch mounted to the cross beam will activate and send a block signal to the control system to prevent any upwards movement, consistent with ASME NOG-1, Section 6442.2.

As a fail-safe, a normally-closed independent limit switch will also be utilized as the final overtravel limit switch. Should the Strand Jack operate past all other safety features, the independent limit switch will activate and open, causing contactors to open, removing power from the hydraulic pump, immediately stopping the flow of hydraulic fluid. This circuit is completely independent of the PLC-based control system, and provides equivalent safety and functionality to the final overtravel limit switch required in ASME NOG-1, Section 6442.3. In case of failure of all protection systems, the top beam has sufficient strength to maintain integrity given full loading from the Strand Jack at MCL hydraulic pressure limits. Emergency lowering of the load is performed using a separate independent control unit for the Strand Jack, to effect manual valve operation. Hydraulic pressure is required for valve operation, and counter-balance valve operation. A backup power supply to operate the hydraulic power unit and control system will be available. In addition, the Strand Jack control valves can be manually manipulated to allow emergency lowering of the load.

3.6.5 Inoperable Swing Cylinder

The hydraulic cylinders that operate the swing arms are mechanically load tested and procured with enhanced factors of safety to make a catastrophic mechanical failure non-credible. Seal leaks and counterbalance valve failures are possible, but they tend to be gradual failures. In this case (i.e., loss of hydraulic power), as well as swing cylinder control failure, hydraulic fluid can be manually bled from the cylinders, allowing gravitational force to pull the swing arms towards one end of travel. In the event the swing arms are at the apex position, rigging can be manually attached, and used to pull the swing arms sufficiently far for gravitational force to become effective. In either case, operators are able to throttle the fluid that is bled off from the cylinders to maintain a slow, controlled motion, such that the swing arms will be at the end of their travel. At that point, the load can then be lowered and placed in a safe condition.

4.0 REGULATORY EVALUATION

4.1 Applicable Regulatory Requirements/Criteria

The Updated Final Safety Analysis Report (UFSAR) and plant procedure changes required to install and operate the Holtec International (Holtec) HI-LIFT at Indian Point Nuclear Generating Unit No. 3 (IP3) have been evaluated to determine whether applicable requirements and regulations continue to be met. Entergy Nuclear Operations, Inc. (Entergy) has determined that the proposed license amendment to add the HI-LIFT does not require any exemptions or relief from regulatory requirements and does not affect conformance with any 10 CFR 50, Appendix A, "General Design Criteria for Nuclear Power Plants," (GDC) criterion that is described in the UFSAR.

GDC Criterion 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. The HI-LIFT safety features are described in Attachment 2. Section 9.1.5, "Overhead Heavy Load Handling Systems," of NUREG-0800, "NRC Standard Review Plan," references the guidelines of NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," and NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," for implementation of these criteria in the design of overhead heavy load handling systems. HI-LIFT will meet the requirements for a single-failure proof lifting device, as defined in NUREG-0612 and NUREG-0554 through compliance with ASME NOG-1 2004, (ASME NOG-1), "Rules for Construction of Overhead and Gantry Cranes," requirements.

The current UFSAR licensing basis includes an analysis of the handling of a spent fuel shipping cask in the area of the spent fuel pool (SFP). The HI-LIFT meets the single-failure-proof requirements of NUREG-0554, through compliance with ASME NOG-1. The HI-LIFT will implement the general guidelines of NUREG-0612, Sections 5.1.1 and 5.1.6, as described in Attachment 2, Appendix B. These combined provisions satisfy NUREG-0612 guidance in assuring a heavy load handling system is sufficiently reliable to preclude the consideration of load drops. The prevention of a cask drop and the handling methods identified in the UFSAR remain bounding for the handling of the Holtec HI-TRAC transfer cask with the HI-LIFT, and the single-failure proof design of the HI-LIFT continues to preclude events in the cask area of the SFP. Since the HI-LIFT will perform heavy lifts within the IP3 Fuel Storage Building (FSB), this amendment request is governed by the regulations of 10 CFR Part 50.

The Holtec Quality Assurance (QA) program was invoked for the design and fabrication of the HI-LIFT. The Holtec QA program complies with the requirements of 10 CFR Part 50, Appendix B. The program encompasses the procurement of components from approved suppliers for use in safety-related applications. Upon arrival on site, the Entergy 10 CFR Part 50, Appendix B QA program will be invoked for the installation of the HI-LIFT, using the engineering design change process.

4.1.1 GDC 2

The IP3 FSB and the structures used to protect and support the HI-LIFT during cask handling, such as the IP3 SFP wall and the IP3 FSB truck bay wall, are designed to withstand the effects of natural phenomena such as earthquake and tornado winds.

The proposed change does not affect compliance with GDC-2, and will ensure that the lowest functional capabilities or performance levels of equipment required for safe operation are met.

4.1.2 ASME NOG-1 Compliance

NUREG-0800 documents the NRC's endorsement of ASME NOG-1 as an acceptable means of satisfying the Guidelines of NUREG-0554. A point-by-point evaluation of the design, fabrication, installation, testing and operation of the HI-LIFT has been completed to demonstrate compliance with the requirements of ASME NOG-1. Attachment 2, Appendix A describes compliance of the HI-LIFT with ASME NOG-1 requirements.

4.1.3 NUREG-0612 Compliance

The guidelines for the control of heavy loads lifts provide assurance for the safe handling of heavy loads in areas where a load drop could impact stored spent fuel, spent fuel in dry cask storage (DCS), or equipment required to provide safe shutdown or continued decay heat removal. The areas applicable to NUREG-0612 are: in or around the spent fuel pool; in or around a cask loaded with spent fuel; and, in or around safe shutdown equipment. There is no safe shutdown equipment associated with the handling of heavy loads. The heavy loads program prohibits travel with a heavy load over the spent fuel pool.

The physical design and location of the HI-LIFT prevent the lifting of the HI-TRAC transfer cask over fuel stored in the SFP. The single-failure proof design of the HI-LIFT precludes drop of a loaded or unloaded cask. Attachment 2, Appendix B describes the HI-LIFT attributes that demonstrate compliance with NUREG-0612.

4.1.4 NUREG-0554 Compliance

The guidelines for a single-failure-proof crane provides assurance of the safe handling of critical loads at nuclear power plants. NUREG-0554 identifies the features of the design, fabrication, inspection, installation, testing and operation of single-failure-proof crane handling systems for critical loads. The system should be designed such that a single failure will not result in the loss of the capability of the system to safely retain the load. The HI-LIFT will meet the requirements for a single-failure proof lifting device as defined in NUREG-0554, through compliance with ASME NOG-1.

The single-failure proof design of the HI-LIFT precludes drop of a loaded or unloaded cask. Attachment 2, Appendix C describes the HI-LIFT design, fabrication, installation, testing and operation attributes that demonstrate compliance with NUREG-0554.

4.1.5 ASME B30.2 Compliance

Following installation, continued inspection, testing and maintenance of the HI-LIFT will be conducted in accordance with ASME B30.2, "Overhead and Gantry Cranes," as required by NUREG-0612. Attachment 2, Appendix D provides the evaluation of HI-LIFT compliance with ASME B30.2.

4.2 Precedent

This license amendment request (LAR) is similar to that approved for the Humboldt Bay Power Plant (HBPP) Davit Crane (ADAMS Accession No. ML053000231). The HI-LIFT design is essentially the same as the HBPP Davit Crane and performs the same lifting functions, employing a commercially available Strand Jack to support the weight of the load and provide the capability to raise and lower the load.

Similar, to the HBPP Davit Crane, this installation and use of HI-LIFT relies on compliance with NUREG-0612. The HI-LIFT will meet the requirements for a single-failure proof lifting device as defined in NUREG-0554, through compliance with ASME NOG-1. The HI-LIFT complies with the additional criteria to prevent the travel of heavy loads over stored spent fuel provided in NUREG-0612, through the HI-LIFT design and operational procedures.

4.3 No Significant Hazards Consideration Analysis

Using the criteria in Title 10 of the Code of Federal Regulations (CFR) Part 50.92, "Issuance of amendment," Entergy Nuclear Operations, Inc. (Entergy) has evaluated the proposed license amendment to Renewed Facility Operating License (FOL) DPR-64 for Indian Point Nuclear Generating Unit No. 3 (IP3). The proposed license amendment requests U.S. Nuclear Regulatory Commission (NRC) approval to incorporate, into the IP3 Licensing Basis, the installation and use of a new single failure proof auxiliary lifting device (i.e., the Holtec International (Holtec) HI-LIFT) to handle a dry cask storage (DCS) transfer cask (i.e., the HI-TRAC) in the IP3 Fuel Storage Building (FSB). The change to the IP3 licensing basis will be documented in a proposed change to the IP3 Updated Final Safety Analysis Report (UFSAR). Entergy has determined that the proposed change does not involve a significant hazards consideration.

Specifically, Entergy has requested the following:

- NRC approval of the analyses and methods used to design and evaluate the HI-LIFT auxiliary lifting device as acceptable for qualification to meet the single-failure proof criteria of NUREG-0554, and NUREG-0612, through compliance with ASME NOG-1; and

- NRC approval to revise the IP3 UFSAR to include a description of HI-LIFT and its use.

The installation and use of the HI-LIFT auxiliary lifting device has been evaluated and the analysis has concluded:

- *This change does not involve a significant increase in the probability or consequences of an accident previously evaluated.*

- *This change does not create the possibility of a new or different kind of accident previously evaluated.*

- *This change does not involve a significant reduction in a margin of safety.*

The basis for this no significant hazards consideration determination is presented below:

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

   Response: No

   The installation and use of the HI-LIFT at IP3 to handle DCS transfer casks in the IP3 FSB does not affect or impact the probability or consequences of the existing Fuel Cask Drop accident, Loss of Spent Fuel Pool Cooling or Inventory accident, or the Accidental Release of Waste Liquid accident, as described in the UFSAR. The HI-LIFT is designed to meet the single-failure proof criteria of NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," and NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," through compliance with American Society of Mechanical Engineers (ASME) NOG-1, 2004 (ASME NOG-1), "Rules for Construction of Overhead and Gantry Cranes," rendering cask drops as non-credible.

   The design of the HI-LIFT and associated procedures provide assurance that operational error and mishandling events will not result in an increase in the probability or consequences of an accident previously analyzed. For HI-LIFT motion control, all safety features are implemented per applicable ASME NOG-1 requirements. Compared with a conventional overhead crane, the HI-LIFT moves over a more limited travel path and operates at lower speeds reducing the opportunities for errors and mishandling events. The physical design of the HI-LIFT prohibits motion over the area of the SFP with racks containing spent fuel. NOG-1 and NUREG-0612 guidelines will be incorporated into the HI-LIFT written site operating procedures and training to minimize the risk of mishandling events. The HI-LIFT machine controls utilize interlocks and safety features to mitigate mishandling events. Since cask drops using the HI-LIFT are precluded, considerations of the cask falling and damaging the spent fuel pool (SFP) or SFP liner are also precluded. The proposed design and installation of HI-LIFT provides assurance that seismic events will not result in an increase in the probability or consequence of an accident previously analyzed.

Therefore, this change does not involve a significant increase in the probability or consequences of an accident previously evaluated.

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

Response: No

The HI-LIFT auxiliary lifting device is designed and installed to meet the single-failure proof criteria of NUREG-0554 and NUREG-0612, through compliance with ASME NOG-1. These are the same criteria used to minimize a cask drop event and prevent heavy loads movement over spent fuel that are applied to the current plant equipment and procedures. Based on compliance of the HI-LIFT design with ASME NOG-1, no load will lower uncontrollably or drop in or around the SFP or near an open cask containing spent fuel, nor will a cask containing spent fuel drop or be lowered uncontrollably during operation of the HI-LIFT. Therefore, installation and use of the HI-LIFT in the IP3 FSB to transfer empty and loaded DCS casks does not create the possibility of a new or different kind of accident.

Therefore, the proposed change does not create the possibility of a new or different kind of accident from any previously evaluated.

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

Response: No

The HI-LIFT has been designed to meet the specifications found in ASME NOG-1, which has been endorsed by the NRC as an acceptable means of meeting the criteria in NUREG-0554, to provide adequate protection and safety margin against the uncontrolled lowering of the lifted load. Through the robust single-failure-proof load-handling design of HI-LIFT, and the physical location of HI-LIFT which precludes DCS movement over stored spent fuel, cask drops and potential damage to spent fuel are precluded. Therefore, use of the HI-LIFT does not result in a significant reduction in a margin of safety.

Therefore, this change does not involve a significant reduction in a margin of safety.

Based upon the reasoning presented above, Entergy concludes that the requested change presents no significant hazards considerations, as set forth in 10 CFR 50.92(c), and accordingly, a finding of "no significant hazards consideration" is warranted.

4.4 Conclusions

In conclusion, based on the considerations discussed above, (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission’s regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

5.0 ENVIRONMENTAL CONSIDERATION

The proposed change would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR Part 20, and would change an inspection or surveillance requirement. However, the proposed change does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluents that may be released offsite, or (iii) a significant increase in individual or cumulative occupational radiation exposure. Accordingly, the proposed change 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 need be prepared in connection with the proposed change.

6.0 REFERENCES

6.1 Updated Final Safety Analysis for Indian Point 3, U3 FSAR, Revision 8

6.2 ASME B30.2-1976, "Overhead and Gantry Cranes, American National Standards Institute," August 1976

6.3 NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," July 1980

6.4 NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," May 1979

6.5 ASME NOG-1, "Rules for construction of Overhead and Gantry Cranes," February 2004

6.6 Safety Evaluation Report for the Humboldt Bay Power Plant Unit 3, December 15, 2005, (ADAMS Accession No. ML053000231)

7.0 ATTACHMENTS

1. Proprietary HI-LIFT Design and Installation Figures

2. Proprietary Holtec Report HI-2188549, "HI-LIFT Design Specification for IPEC Unit 3"

3. Proprietary HI-LIFT Licensing Drawing, 11654R1

4. Proprietary Holtec Report HI-2188625, "Structural Evaluation of HI-LIFT Device and Fuel Storage Building Walls at Indian Point Unit 3"

5. Indian Point Nuclear Generating Unit No. 3 UFSAR changed pages

6. Holtec Affidavit Pursuant to 10 CFR 2.390, dated March 5, 2020

Enclosure, Attachment 1

NL-20-021

HI-LIFT Design and Installation Figures

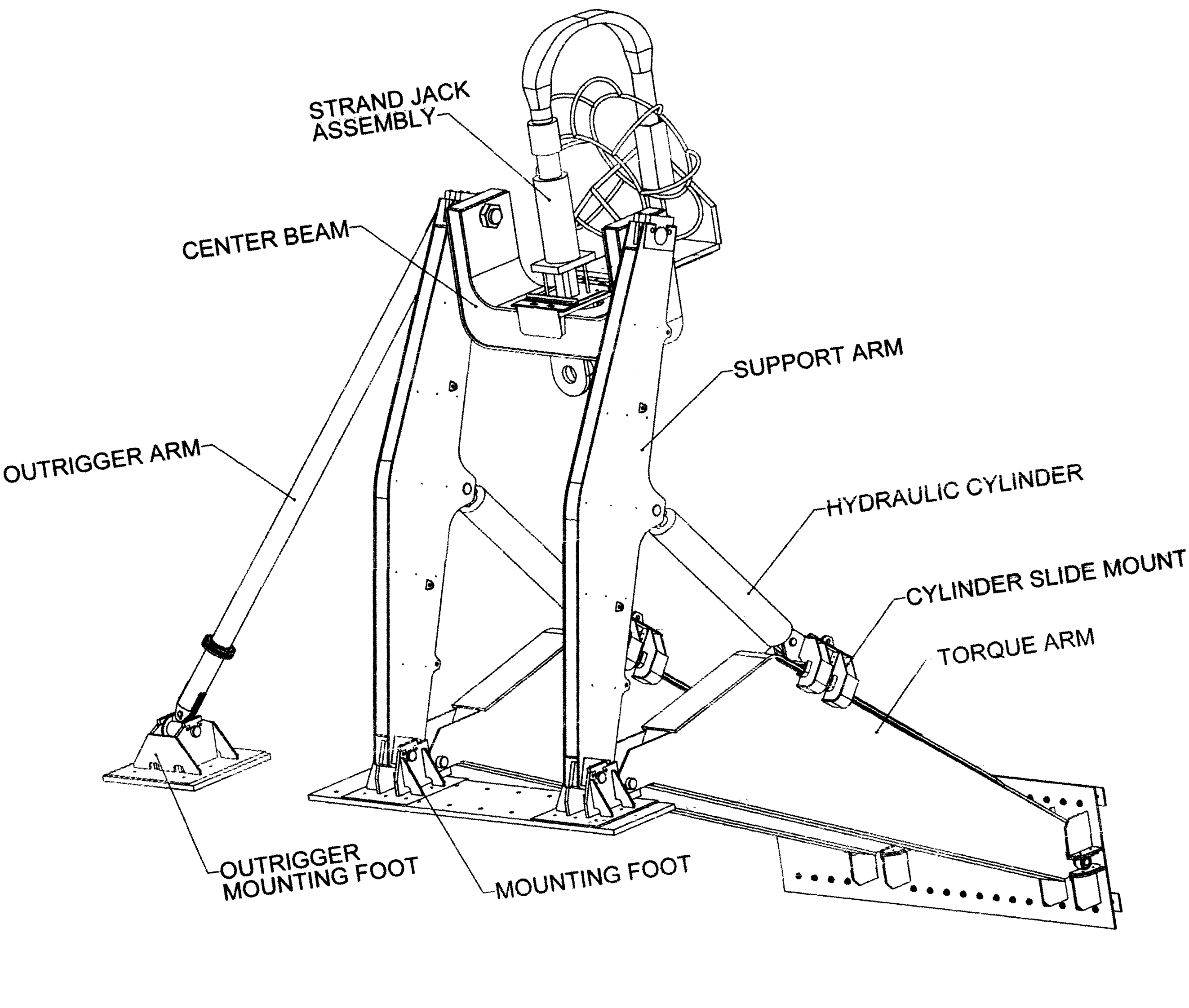

Figure 1: HI-LIFT ISO View

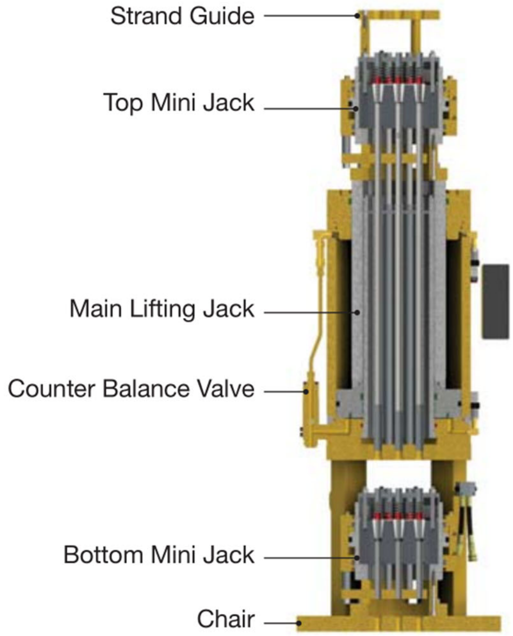

Figure 2: Strand Jack Diagram

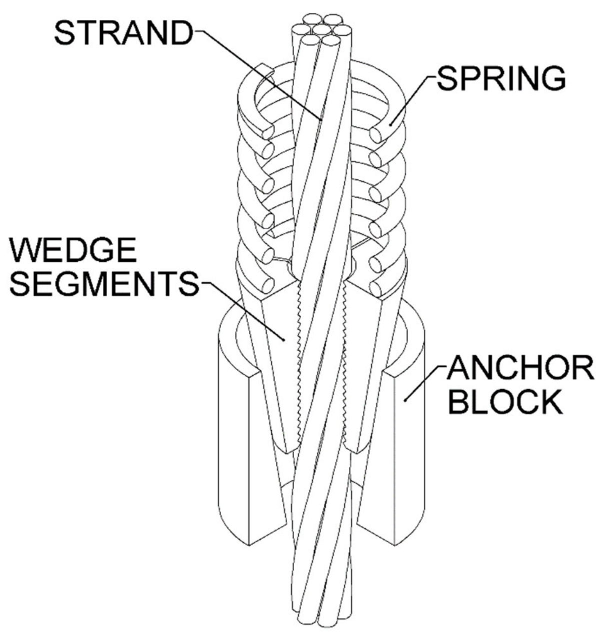

Figure 3: Simplified Strand Jack Wedge Diagram

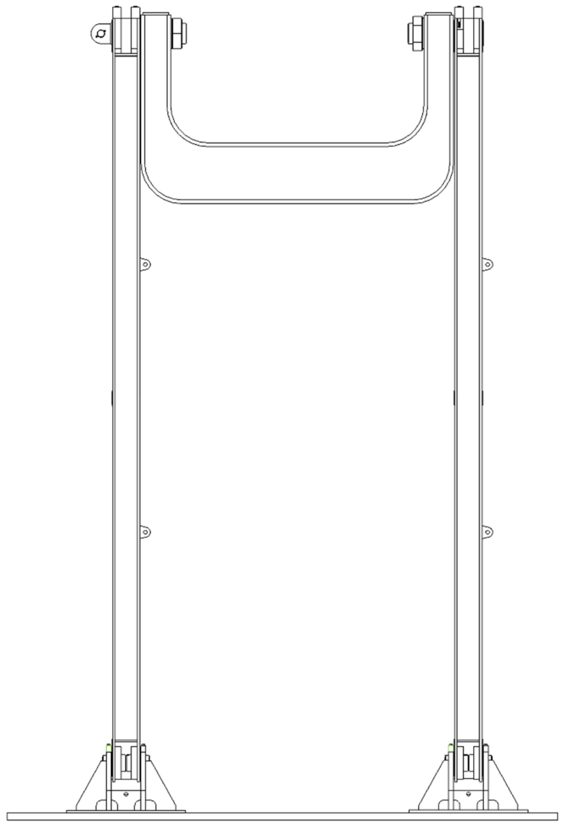

Figure 4: HI-LIFT Frame

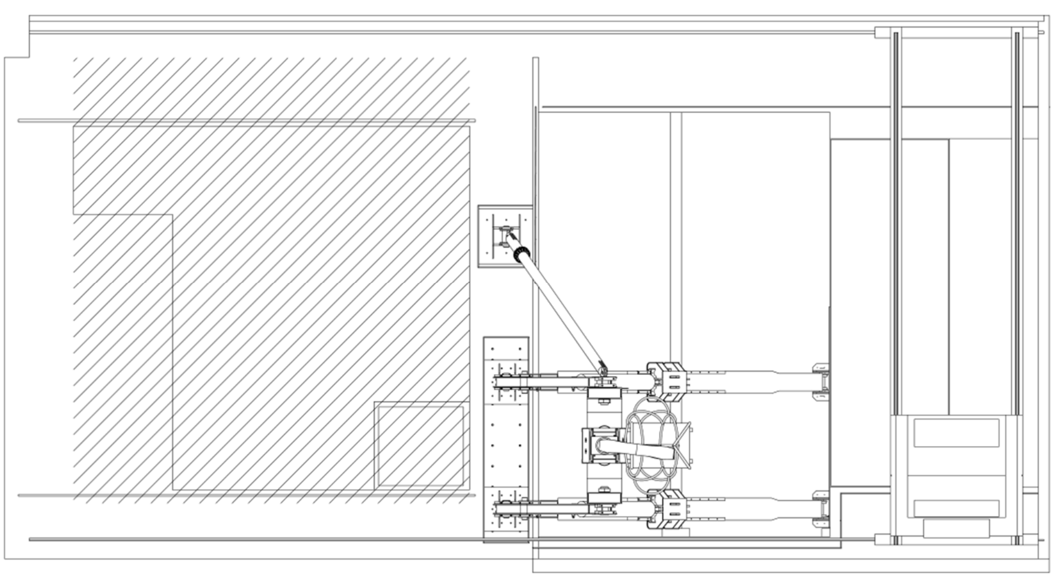

Figure 5: HI-LIFT Installation (Illustr.) Plan View

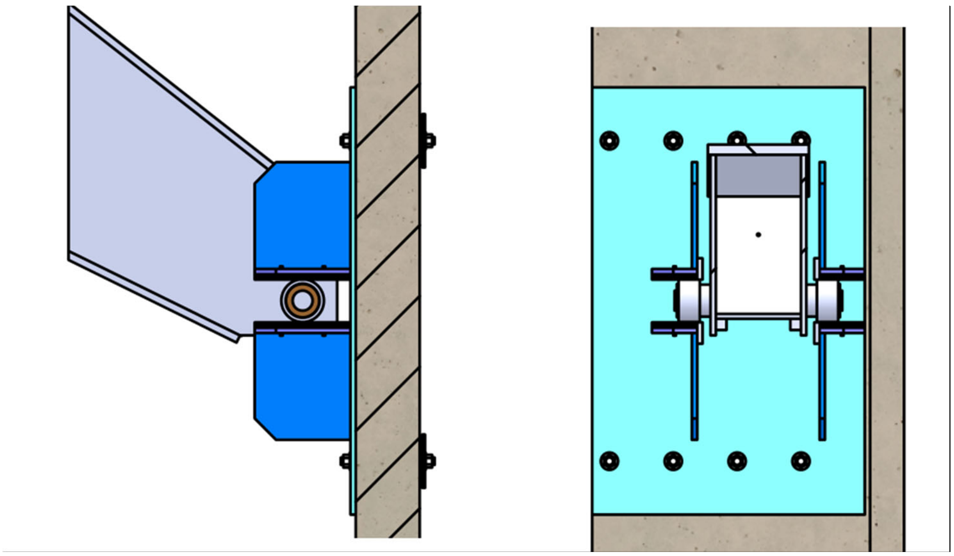

Figure 6: TRUCK BAY WALL ROLLER SYSTEM (ILLUST.)

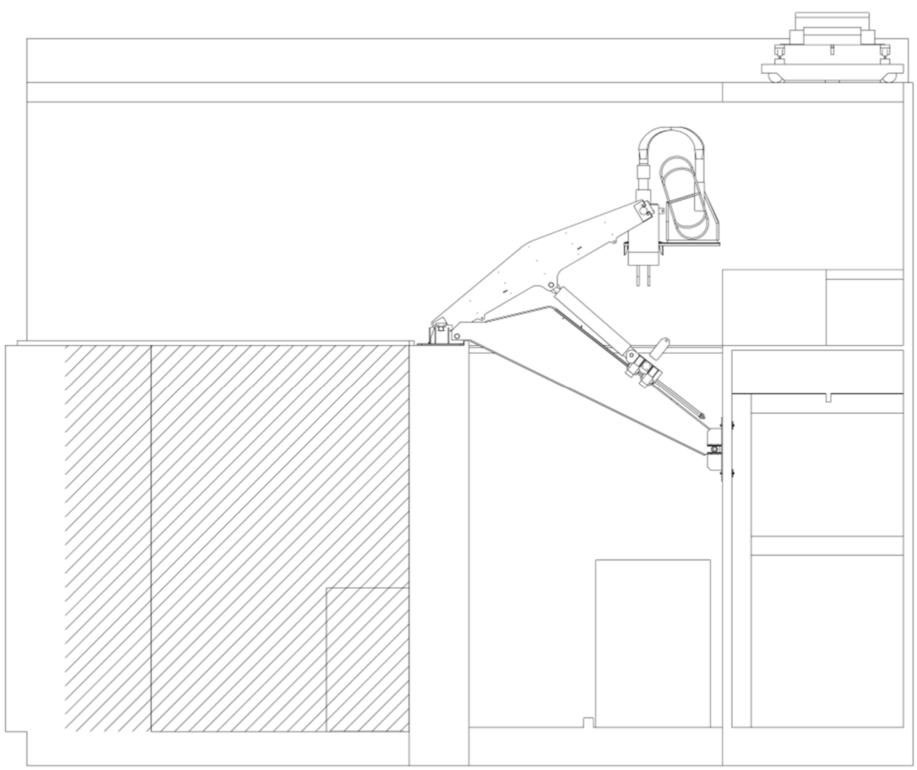

Figure 7: HI-LIFT Maintenance Position (Illustr.) Elevation View

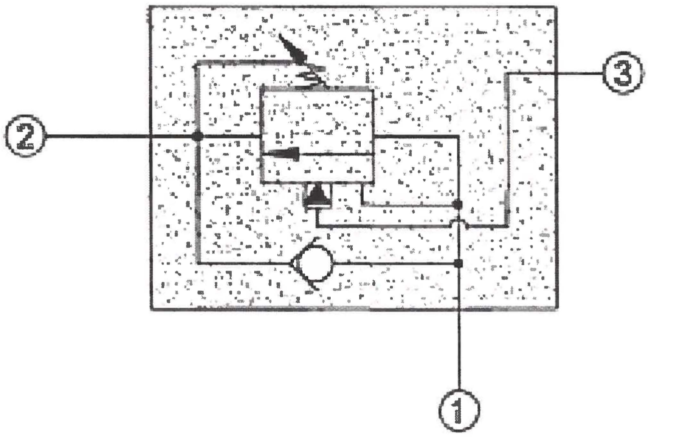

Figure 8: Counter-Balance Valve schematic

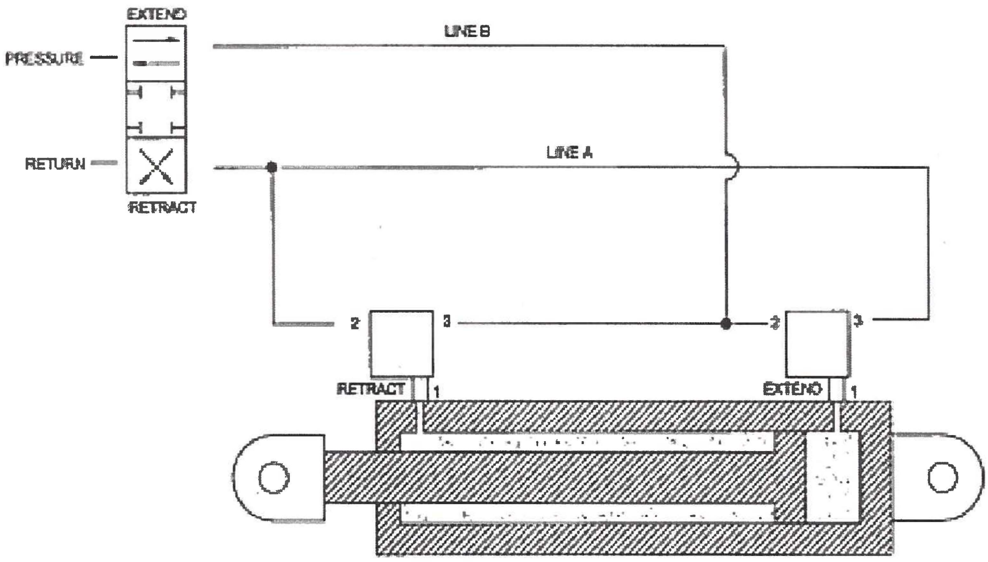

Figure 9: Double-acting counter-balance valve system

Enclosure, Attachment 5

NL-20-021

Indian Point Nuclear Generating Unit No. 3 UFSAR changed pages

N14.5. The HI-TRAC top lid is installed and the bolts are tightened and the seal is tested in accordance with ANSI N14.5. The HI-TRAC side radiation levels are measured to verify compliance with Technical Specification requirements. The IP3 FSB truck bay door is opened and the loaded HI-TRAC is moved outside the IP3 FSB to the VCT on Air Pads using the Prime Mover.

The VCT travels inside the Protected Area on the approved haul route between IP3 and IP2. Prior to each transfer of spent fuel assemblies, the haul route is visually inspected and repaired as necessary.

The HI-TRAC containing the loaded STC is lowered from the VCT onto the IP2 LPT and moved into the IP2 FSB. Inside the IP2 FSB, the HI-TRAC is positioned beneath the 110-Ton Ederer Crane. A drain line containing a pressure gauge is connected to the HI-TRAC's top lid vent port and opened relieving any internal pressure. The HI-TRAC top lid bolts are removed and the HI-TRAC top lid is removed. The drain line is then attached to the vent port connection located on the lid of the STC and opened relieving any internal STC pressure. STC lid nuts and washers are removed.

The Lift Cleats (with the Lift Cleat Adapter) are attached to the STC lid (the STC Lifting Devices already are installed on the STC lid). The 110-Ton Ederer Crane is attached to the STC through the Lift Cleat Adapter. The STC lifting device arms are engaged with the STC trunnions. Under the direction of Radiation Protection personnel the STC is raised out of the HI-TRAC and positioned directly over the SFP cask loading area and lowered into the pool. IP2 Technical Specification 3.7.12 requires that boron levels in the IP2 SFP have a concentration of greater than 2000ppm which is also required for the STC spent fuel unloading activities.

With the STC in the SFP cask loading area, the STC Lifting Devices are released from the STC lifting trunnions and the STC lid is removed. The spent fuel assemblies and associated non-fuel hardware are removed from the STC and placed into the SFP racks in accordance with the requirements of the IP2 Technical Specification 3.7.13. The STC lid is positioned over the STC and installed. The lid's STC Lifting Devices are attached to the STC lifting trunnions and the STC is raised to the surface of the SFP. Any standing water in the lid is removed. Under the direction of Radiation Protection personnel the STC is raised and removed from the SFP, sprayed with demineralized water, and the water inside the STC is lowered before the STC is placed into the HI-TRAC. The STC lid studs and nuts are installed and the lid studs and nuts are tightened. The Lift Cleats are disconnected from the STC top lid and the Lift Cleats and Lift Cleat Adapter are removed. The HI-TRAC top lid is installed, the bolts are tightened, and the HI-TRAC containing the empty STC is then ready to be returned to the IP3 FSB.

Insert 1

REFERENCES FOR SECTION 9.5

1. Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. 246 to Facility Operating License No. DPR-64, July 13, 2012.

2. Holtec Report HI-2094289, Licensing Report on the Inter-Unit Transfer of Spent Nuclear Fuel at Indian Point Energy Center, Revision 6.

Insert 2

INSERT 1 (page 1 of 2)

9.5.7 Spent Fuel Cask Operations Using HI-LIFT Ancillary Lifting Device

By Safety Evaluation dated April XX, 2021 (Ref. 3) , the NRC issued license amendment XXX, which approved the installation and use of a specially designed ancillary lifting device (i.e., the Holtec HI-LIFT) in the IP3 Spent Fuel Building to safely lift a HI-TRAC transfer cask with a full-sized, and either empty or fully-loaded Holtec multi-purpose cannister (MPC)-32 storage cask.

The HI-LIFT is a wall mounted, removable device that is rated for 100 tons. The HI-LIFT will only be used to lift the HI-TRAC / MPC-32 within the IP3 spent fuel building. The HI-LIFT is designed to meet the single-failure-proof criteria of NUREG-0554 and NUREG-0612 through compliance with ASME NOG-1, 2004. Associated lifting devices and interfacing lift points also satisfy the guidance of NUREG-0612 in order to ensure the entire fuel handling lift system complies with the single-failure proof guidance of NUREG-0612 for each heavy load lift in or around the spent fuel pool (SFP), or in or around a cask loaded with spent fuel, or a lift of a cask loaded with spent fuel. All heavy lifts will use safe load paths in compliance with NUREG 0612, and operator training will also conform to the recommendations of the regulatory guidance.

The HI-LIFT provides the required hoisting capability through the use of a strand jack to lift and lower the load. The strand jack is a commercial component used worldwide in the construction industry with proven reliability. The HI-LIFT strand jack uses 48 strands to support the HI-TRAC and lift yoke. The strands are much thicker than cable and will not lead to a slack rope condition. A cable management system (i.e., a recoiler), maintains cable alignments as the load is raised and lowered. The strand jack uses two sets of wedge locks and a reciprocating hydraulic cylinder to lift and lower the load. While the load is raised, the lower wedge lock set holds the load in place until the load is taken by the upper wedge lock set. The reverse occurs during load lowering.

The strand jack is supported by a center beam that transfers the load outwards to two support arms, forming an inverted U-shaped frame. The U-frame is supported with a pinned connection to steel base frames (mounting feet) mounted to the top surface of the structural SFP wall. Pivoting the U-frame about the bottom pins provides a translation motion with a range sufficient enough to reach a canister processing location (“washdown area”) adjacent to the truck bay, and a cask loading position in the spent fuel pool.

Translational motion is provided by the HI-LIFT frame and support arms. The HI-LIFT frame moves the strand jack unit horizontally by pivoting through a defined travel path via the bottom pins attached to the support arms. The travel path encompasses the truck bay washdown area and the cask loading area of the SFP. The length of the support arms limits the travel path of the HI-LIFT and prevents cask movement over spent fuel stored in the SFP racks.

Support arm motion is powered by hydraulic cylinders, which react against the torque arms, which in turn react against brackets mounted to the south wall of the truck bay. An additional Outrigger Arm provides stability and bracing for loading perpendicular to the direction of load translation. Below the strand jack, the lifting strands connect to a yoke designed to engage with the HI-TRAC using swinging lift arms. An electrically driven hydraulic power unit is located in a separate area to power the hydraulic action of the strand jack and hydraulic cylinders. An operator control station is also located here to allow control of the unit, monitoring of the lift, and alarming and indication functions for operators.

INSERT 1 (page 2 of 2)

The HI-LIFT frame is mounted to the top surface of the SFP wall, adjacent to the cask-loading pit and the torque arms are anchored to the fuel building wall directly across from the SFP wall (i.e., the south truck bay wall). The HI-LIFT will be supported entirely by the six-foot thick south SFP wall. Loads from the torque arms on the south truck bay wall will be limited to vertical reactions, through the use of a roller system.

The anchor system connects the mechanical and steel structural portions of the ancillary to the reinforced concrete structure of the fuel building. Steel baseplates are machined to match the actual locations of the field installed concrete undercut anchors on the spent fuel pool wall and leveled and grouted in place. The baseplates provide threaded holes for attachment of the primary lifting device subcomponents. Attachment to the truck bay wall is made by through drilling, and using studs, with washers and nuts, rather than undercut anchors.

The HI-LIFT is capable of:

1. Connecting to a suitable lift yoke, which engages with the lifting trunnions of a HI-TRAC 100D overpack, while the HI-TRAC is loaded with an empty or loaded MPC-32 canister, and placed in position at ground level in the washdown area.
2. Lifting the HI-TRAC from the washdown area of the IP3 spent fuel building to a height sufficient to clear the wall and curb on the south side of the IP3 spent fuel pool wall.
3. Translating the HI-TRAC northwards, over the spent fuel pool wall.
4. Lowering the HI-TRAC into the pool in a slow and controlled manner. The location in the pool must be within the working range of the spent fuel handling machine and must not cause violations of minimum water cover requirements.
5. Lifting the loaded HI-TRAC out of the spent fuel pool, translating, and lowering the HI-TRAC to the wash-down area in a slow and controlled manner.
6. Disengaging from the HI-TRAC and retreating clear of subsequent loading activities.

The structural evaluation of the HI-LIFT was performed using the finite element method to calculate normal beam stresses in the structural members for all load cases per ASME NOG-1. The finite element model of the HI-LIFT is built in ANSYS 17.1. The HI-LIFT was designed to satisfy the stress limits of ASME NOG-1 under normal and seismic conditions.

The structural evaluation of the spent fuel pool wall and the truck bay wall demonstrate that these components are structurally adequate per ACI 318-63 to support the loads imparted by the HI-LIFT (Ref. 4). The building walls are evaluated under the three load combinations, LC1, LC2 and LC3 to withstand the bounding loads imparted by the HI-LIFT. In addition to the loads from the HI-LIFT, the SFP wall also includes the hydrostatic pressure and hydro dynamic loads, as applicable

The results of the structural analysis (Ref. 4) indicate that all the evaluated safety factors are greater than 1.0, thus qualifying the HI-LIFT, spent fuel building walls, and the anchoring system as structurally adequate under all applicable load combinations. Additionally, all safety factors for the mechanical components of the HI-LIFT are greater than 2.0 under the normal load case, thus satisfying the single failure proof criteria. Based on these results, the HI-LIFT and the supporting wall structures are structurally adequate for the intended use.

INSERT 2

3. Safety Evaluation by the Office of Nuclear Reactor Regulation Related to Amendment No. XXX to Facility Operating License No. DPR-64, dated April XX, 2021.

4. Holtec Report HI-2188625, "Structural Evaluation of HI-LIFT Device and Spent Fuel Building Walls at Indian Point Unit 3," Revision 0.

Insert 3

9.12.5 Safety Evaluation

The controls implemented to address NUREG- 0612 Phase 1 elements make the risk of a load drop very unlikely. The use of increased safety factors for load path elements makes the risk of a load drop extremely unlikely and acceptably low. In the event of a postulated load drop, the consequences are acceptable, as demonstrated by system analyses or the load drop analysis. Restrictions on load height, load weight, and medium under the load are reflected in plant procedures. The risk associated with the movement of heavy loads is evaluated and controlled by station procedures.

INSERT 3 (page 1 of 2)

9.12.4.4 HI-LIFT Ancillary Lifting Device for Spent Fuel Casks

The Holtec HI-LIFT ancillary lifting device is used in the IP3 Spent Fuel Building to safely lift a HI-TRAC transfer cask with a full-sized, and either empty or fully-loaded MPC-32 storage cask. (also described in Section 9.5.7)

The HI-LIFT is designed to meet the single-failure-proof criteria of NUREG-0554 and NUREG-0612 through compliance with ASME NOG-1, 2004. Associated lifting devices and interfacing lift points also satisfy the guidance of NUREG-0612 in order to ensure the entire fuel handling lift system complies with the single-failure proof guidance of NUREG-0612 for each heavy load lift in or around the Spent Fuel Pool, or in or around a cask loaded with spent fuel, or a lift of a cask loaded with spent fuel. All heavy lifts will use safe load paths in compliance with NUREG 0612, and operator training will also conform to the recommendations of the regulatory guidance.

The design of the HI-LIFT and associated operating procedures provide assurance that operational error and mishandling events will not result in an increase in the probability or consequences of an accident previously analyzed. For HI-LIFT motion control, all safety features are implemented per applicable NOG-1 requirements. Compared with a conventional overhead crane, the HI-LIFT moves over a more limited travel path and operates at lower speeds reducing the opportunities for errors and mishandling events.

The physical design of HI-LIFT prohibits motion over the area of the SFP with racks containing spent fuel. The HI-LIFT is designed so that its hoisting frame can only travel along one axis of motion. It must swing down from its starting position, to lift the HI-TRAC from the truck bay and swing in the opposite direction along the same axis to lower the HI-TRAC into the cask loading area of the SFP. NOG-1 and NUREG-0612 guidelines have been incorporated into HI-LIFT written site operating procedures and training to minimize the risk of operation errors. In addition, the HI-LIFT machine controls utilize interlocks and safety features to mitigate operational errors.

The HI-LIFT complies with the applicable guidelines in NUREG 0612, Section 5.1.1, as described below:

Guideline 1 - Safe Load Paths

The physical design of HI-LIFT prohibits motion over the area of the SFP with racks containing spent fuel. The HI-LIFT is designed so that its hoisting frame can only travel along one axis of motion. It must swing down from its starting position, to lift the HI-TRAC from the truck bay and swing in the opposite direction along the same axis to lower the HI-TRAC into the cask loading area of the SFP.

INSERT 3 (page 2 of 2)

Guideline 2 – Load Handling Procedures

IP3 procedures for the handling of heavy loads have been revised to address HI-LIFT and related heavy load lifts associated with dry cask storage operations. HI-LIFT procedures utilized for cask lifts include: identification of required equipment, inspections and acceptance criteria required before load movement; the steps and proper sequence to be followed in handling the load; defining the safe load path; and other precautions. A specific cask loading and handling procedure provides additional details for controlled movement during cask handling operations.

Guideline 3 - HI-LIFT Operator Training

Training specific to the HI-LIFT has been developed in accordance with the requirements listed within the IP3 UFSAR and NUREG 0612.

Guideline 4 - Special Lifting Devices

The HI-LIFT will interface with the HI-TRAC transfer cask through a suitable lift yoke that meets the requirements within the HI-STORM 100 FSAR.

Guideline 6 - HI-LIFT Inspection, Testing and Maintenance

The HI-LIFT will be inspected, tested and maintained in accordance with ANSI B30.2-1976 and applicable sections of ASME NOG-1.

Guideline 7 - HI-LIFT Design

The HI-LIFT is designed to meet the single-failure-proof criteria of NUREG-0554 and NUREG-0612 through compliance with ASME NOG-1.

Enclosure, Attachment 6

NL-20-021

Holtec Affidavit Pursuant to 10 CFR 2.390, dated March 5, 2020

AFFIDAVIT PURSUANT TO 10 CFR 2.390

I, Kimberly Manzione, being duly sworn, depose and state as follows:

(1) I have reviewed the information described in paragraph (2) which is sought to be withheld, and am authorized to apply for its withholding.

(2) The information sought to be withheld are Attachments 1 through 4 to Entergy Letter NL-20-021 which contain Holtec Proprietary information.

(3) In making this application for withholding of proprietary information of which it is the owner, Holtec International relies upon the exemption from disclosure set forth in the Freedom of Information Act ("FOIA"), 5 USC Sec. 552(b)(4) and the Trade Secrets Act, 18 USC Sec. 1905, and NRC regulations 10CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial or financial information obtained from a person and privileged or confidential" (Exemption 4). The material for which exemption from disclosure is here sought is all "confidential commercial information", and some portions also qualify under the narrower definition of "trade secret", within the meanings assigned to those terms for purposes of FOIA Exemption 4 in, respectively, Critical Mass Energy Project v. Nuclear Regulatory Commission, 975F2d871 (DC Cir. 1992), and Public Citizen Health Research Group v. FDA, 704F2d1280 (DC Cir. 1983).

(4) Some examples of categories of information which fit into the definition of proprietary information are:

a. Information that discloses a process, method, or apparatus, including supporting data and analyses, where prevention of its use by Holtec's competitors without license from Holtec International constitutes a competitive economic advantage over other companies;

b. Information which, if used by a competitor, would reduce his expenditure of resources or improve his competitive position in the design, manufacture, shipment, installation, assurance of quality, or licensing of a similar product.

c. Information which reveals cost or price information, production, capacities, budget levels, or commercial strategies of Holtec International, its customers, or its suppliers;

d. Information which reveals aspects of past, present, or future Holtec International customer-funded development plans and programs of potential commercial value to Holtec International;

e. Information which discloses patentable subject matter for which it may be desirable to obtain patent protection.

The information sought to be withheld is considered to be proprietary for the reasons set forth in paragraphs 4.a and 4.b above.

(5) The information sought to be withheld is being submitted to the NRC in confidence. The information (including that compiled from many sources) is of a sort customarily held in confidence by Holtec International, and is in fact so held. The information sought to be withheld has, to the best of my knowledge and belief, consistently been held in confidence by Holtec International. No public disclosure has been made, and it is not available in public sources. All disclosures to third parties, including any required transmittals to the NRC, have been made, or must be made, pursuant to

regulatory provisions or proprietary agreements which provide for maintenance of the information in confidence. Its initial designation as proprietary information, and the subsequent steps taken to prevent its unauthorized disclosure, are as set forth in paragraphs (6) and (7) following.

(6) Initial approval of proprietary treatment of a document is made by the manager of the originating component, the person most likely to be acquainted with the value and sensitivity of the information in relation to industry knowledge. Access to such documents within Holtec International is limited on a "need to know" basis.

(7) The procedure for approval of external release of such a document typically requires review by the staff manager, project manager, principal scientist or other equivalent authority, by the manager of the cognizant marketing function (or his designee), and by the Legal Operation, for technical content, competitive effect, and determination of the accuracy of the proprietary designation. Disclosures outside Holtec International are limited to regulatory bodies, customers, and potential customers, and their agents, suppliers, and licensees, and others with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

(8) The information classified as proprietary was developed and compiled by Holtec International at a significant cost to Holtec International. This information is classified as proprietary because it contains detailed descriptions of analytical approaches and methodologies not available elsewhere. This information would provide other parties, including competitors, with information from Holtec International's technical database and the results of evaluations performed by Holtec International. A substantial effort has been expended by Holtec International to develop this information. Release of this information would improve a competitor's position because it would enable Holtec's competitor to copy our technology and offer it for sale in competition with our company, causing us financial injury.

AFFIDAVIT PURSUANT TO 10 CFR 2.390

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(9) Public disclosure of the information sought to be withheld is likely to cause substantial harm to Holtec International's competitive position and foreclose or reduce the availability of profit-making opportunities. The information is part of Holtec International's comprehensive spent fuel storage technology base, and its commercial value extends beyond the original development cost. The value of the technology base goes beyond the extensive physical database and analytical methodology, and includes development of the expertise to determine and apply the appropriate evaluation process.

The research, development, engineering, and analytical costs comprise a substantial investment of time and money by Holtec International.

The precise value of the expertise to devise an evaluation process and apply the correct analytical methodology is difficult to quantify, but it clearly is substantial.

Holtec International's competitive advantage will be lost if its competitors are able to use the results of the Holtec International experience to normalize or verify their own process or if they are able to claim an equivalent understanding by demonstrating that they can arrive at the same or similar conclusions.

The value of this information to Holtec International would be lost if the information were disclosed to the public. Making such information available to competitors without their having been required to undertake a similar expenditure of resources would unfairly provide competitors with a windfall, and deprive Holtec International of the opportunity to exercise its competitive advantage to seek an adequate return on its large investment in developing these very valuable analytical tools.

AFFIDAVIT PURSUANT TO 10 CFR 2.390

STATE OF NEW JERSEY)
) ss:
COUNTY OF CAMDEN)

Kimberly Manzione, being duly sworn, deposes and says:

That she has read the foregoing affidavit and the matters stated therein are true and correct to the best of her knowledge, information, and belief.

Executed at Camden, New Jersey, this 5th day of March, 2020.

Kimberly Manzione
Licensing Manager
Holtec International

Subscribed and sworn before me this 5th day of March, 2020.

Erika Grandrimo
NOTARY PUBLIC
STATE OF NEW JERSEY
MY COMMISSION EXPIRES January 17, 2022