Dominion Energy Kewaunee, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060
Web Address: www.dom.com

Dominion®

PROPRIETARY INFORMATION – WITHHOLD UNDER 10 CFR 2.390

July 28, 2016

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

Serial No. 16-245
LIC/JG/R0
Docket Nos. 50-305, 72-64
License No. DPR-43

DOMINION ENERGY KEWAUNEE, INC.
KEWAUNEE POWER STATION
LICENSE AMENDMENT REQUEST 263; LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) requests an amendment to Facility Operating License DPR-43 for Kewaunee Power Station (KPS). The proposed amendment would revise the KPS Updated Safety Analysis Report (USAR) to: 1) add a description of a non-single failure proof intermediate lifting device that DEK intends to use during a specific spent fuel cask handling activity in the auxiliary building, and 2) incorporate a new load drop analysis applicable to the use of this intermediate lifting device.

DEK has submitted a certification of permanent removal of fuel from the reactor vessel for KPS (Reference 1). Consequently, as specified in 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for KPS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel.

To facilitate transfer of spent fuel into dry cask storage within the ISFSI, DEK intends to use cask handling equipment and methods associated with NAC International, Inc. (NAC) MAGNASTOR System Certificate of Compliance (CoC) 1031. Based on KPS site-specific design considerations, DEK determined that the most appropriate method for transferring a loaded spent fuel transportable storage canister (TSC) into or out of its vertical concrete cask (VCC) involves handling the TSC with a conservatively designed non-single failure proof intermediate lift device (chain hoist assembly). DEK's current licensing basis requires use of single failure proof handling equipment for lifting of a loaded spent fuel canister, including the TSC, in the auxiliary building. Since the chain hoist assembly is not single failure proof, and the MAGNASTOR system is not certified for a cask drop event during dry storage preparation activities inside the Part 50 facility, there is a need to assess certain drop accidents inside the auxiliary building that have not previously been evaluated by DEK or the Nuclear Regulatory Commission (NRC). Therefore, analyses have been performed to demonstrate acceptable consequences of a postulated load drop during TSC handling activities. As demonstrated in this amendment request, the consequences of a potential drop of a loaded TSC into the concrete cask would be within acceptable limits for maintaining physical canister integrity, cooling, and subcriticality. Accordingly, the radiological consequences of the analyzed drop event are bounded by previously evaluated accidents. The proposed change is being submitted to the NRC for approval prior to implementation, as required by 10 CFR 50.59(c)(2).

A001
NMSS26
NRR
NMSS

ENCLOSURES 1 AND 2 CONTAIN INFORMATION BEING WITHHELD FROM PUBLIC DISCLOSURE PER 10 CFR 2.390. UPON SEPARATION, THIS LETTER IS DECONTROLLED

Attachment 1 of this letter contains a description, technical analysis, significant hazards determination, and environmental considerations evaluation for the proposed amendment. Attachment 2 contains the marked-up Updated Safety Analysis Report (USAR) page. Attachment 3 contains a new Technical Requirements Manual (TRM) section. Attachment 4 contains cask handling configuration diagrams. Attachments 3 and 4 are provided for information to facilitate the NRC staff's understanding of this change.

Enclosure 1 to this letter, which is proprietary in its entirety, is the NAC load drop analysis. Enclosures 2 and 3 to this letter are the proprietary and non-proprietary versions, respectively, of an analysis of structural consequences on the auxiliary building truck bay and spent fuel pool resulting from the load drop. Enclosures 1 and 2 contain information proprietary to NAC International. Enclosure 4 provides an affidavit executed to support withholding of Enclosures 1 and 2 from public disclosure. The affidavit sets forth the basis upon which the information may be withheld from public disclosure by the Commission and addresses the considerations listed in 10 CFR 2.390(b)(4). Accordingly, it is requested that the proprietary information contained in Enclosures 1 and 2 be withheld from public disclosure in accordance with 10 CFR 2.390(a)(4).

The KPS Facility Safety Review Committee has reviewed the proposed amendment and a copy of this submittal has been provided to the State of Wisconsin in accordance with 10 CFR 50.91(b).

In order to support the current decommissioning schedule, DEK requests approval of this proposed amendment as expeditiously as possible. Once approved, the amendment will be implemented within 60 days.

Please contact Mr. Jack Gadzala at 920-388-8604 if you have any questions or require additional information.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering

Vicki L. Hull
NOTARY PUBLIC
Commonwealth of Virginia
Reg. # 140542
My Commission Expires May 31, 2018

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

The foregoing document was acknowledged before me, in and for the County and Commonwealth aforesaid, today by Mark D. Sartain, who is Vice President – Nuclear Engineering of Dominion Energy Kewaunee, Inc. He has affirmed before me that he is duly authorized to execute and file the foregoing document on behalf of that Company, and that the statements in the document are true to the best of his knowledge and belief.

Acknowledged before me this 28TH day of July, 2016.

My Commission Expires: 5-31-18 Notary Public Vicki L. Hull

Commitments made in this letter: None.

References:

1. Letter from D. G. Stoddard (DEK) to NRC Document Control Desk, "Certification of Permanent Removal of Fuel from the Reactor Vessel," dated May 14, 2013 [ADAMS Accession No. ML13135A209].

Attachments:

1. Discussion of Change, Technical Analysis, Significant Hazards Determination, and Environmental Considerations
2. Marked-up Updated Safety Analysis Report Page
3. TRM 8.9.5, "MAGNASTOR Fuel Cask Handling Away from Spent Fuel Pool"
4. Cask Handling Configuration Diagrams

Enclosures:

1. Evaluation of TSC Drop into VCC on the Heavy Haul Trailer (Proprietary)
2. Structural Consequences for the Auxiliary Building Truck Bay (Proprietary)
3. Structural Consequences for the Auxiliary Building Truck Bay (Non-Proprietary)
4. NAC International Affidavit Pursuant to 10 CFR 2.390

cc: Regional Administrator, Region III
U. S. Nuclear Regulatory Commission
2443 Warrenville Road, Suite 210
Lisle, IL 60532-4352

Ted H. Carter, Senior Project Manager
U.S. Nuclear Regulatory Commission
Two White Flint North, Mail Stop T-8F5
11545 Rockville Pike
Rockville, MD 20852-2738

Public Service Commission of Wisconsin
Electric Division
P.O. Box 7854
Madison, WI 53707

ATTACHMENT 1

LICENSE AMENDMENT REQUEST 263:
LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

DISCUSSION OF CHANGE, TECHNICAL ANALYSIS, SIGNIFICANT HAZARDS DETERMINATION, AND ENVIRONMENTAL CONSIDERATIONS

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.

LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

DISCUSSION OF CHANGE, TECHNICAL ANALYSIS, SIGNIFICANT HAZARDS DETERMINATION AND ENVIRONMENTAL CONSIDERATIONS

1.0 SUMMARY DESCRIPTION

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) requests an amendment to Facility Operating License DPR-43 for Kewaunee Power Station (KPS). The proposed amendment would revise the KPS Updated Safety Analysis Report (USAR) Section 9.5.2.2.4, "Auxiliary Building Crane" to: 1) add a description of a non-single failure proof intermediate lifting device that DEK intends to use during a specific spent fuel cask handling activity in the auxiliary building, and 2) incorporate a new load drop analysis applicable to the use of this intermediate lifting device. The amendment also includes (for information) a new Technical Requirements Manual (TRM) section that governs the use of the non-single failure proof intermediate lifting device to ensure compliance with the required parameters in the load drop analysis.

DEK has submitted a certification of permanent removal of fuel from the reactor vessel for KPS (Reference 1). Consequently, as specified in 10 CFR 50.82(a)(2), the 10 CFR Part 50 license for KPS no longer authorizes operation of the reactor or emplacement or retention of fuel into the reactor vessel.

DEK is in the process of decommissioning KPS and transferring all remaining spent fuel in the spent fuel pool to the Independent Spent Fuel Storage Installation (ISFSI). To facilitate the transfer of spent fuel into dry cask storage within the ISFSI, DEK intends to use cask handling equipment and methods associated with NAC International, Inc. (NAC) MAGNASTOR System Certificate of Compliance (CoC) 1031. Based on KPS site-specific design considerations, DEK determined that the most appropriate method for transferring a loaded spent fuel transportable storage canister (TSC) into or out of its vertical concrete cask (VCC) involves handling the TSC with a conservatively designed non-single failure proof intermediate lift device (chain hoist assembly). During this activity, the chain hoist assembly is configured between the auxiliary building overhead crane hook and the TSC. The chain hoist assembly is used while the TSC is contained within a MAGNASTOR transfer cask (MTC) and in a stack-up configuration atop the VCC. The chain hoist assembly will be used primarily for the purpose of transferring a loaded TSC between the MTC and the VCC.

The current KPS licensing basis assumes loading and handling of spent fuel casks in the auxiliary building is performed using single failure proof equipment. Previous spent fuel canister handling activities (using a different cask system) were performed using the auxiliary building (AB) crane and associated lifting devices that met the single failure proof guidance of NUREG-0612, Section 5.1.6 (Reference 3) and NUREG-0554.

Therefore, as approved in KPS License Amendment 200 (Reference 2), a cask drop associated with use of the AB crane single failure proof handling system was not considered credible and a cask handling accident was not required to be included in the KPS USAR.

Although the chain hoist assembly is designed with enhanced safety features for handling critical loads, it does not meet the single failure proof guidance of NUREG-0612. Additionally, as stated in NRC Regulatory Issue Summary (RIS) 2005-25 (Reference 4), the guidelines contained in NUREG-0612 do not include provisions for use of chain hoists. Because the chain hoist assembly is not single failure proof, a load drop analysis has been performed to demonstrate acceptable consequences of a postulated load drop while using the device. This analysis is being submitted for NRC review and approval under 10 CFR 50.59(c)(2).

There are no other KPS amendment requests associated with fuel cask handling currently under NRC review. Therefore, no disposition of other license changes, as they relate to this license amendment request, is needed.

2.0 PROPOSED CHANGES

The proposed amendment would revise the KPS USAR, Section 9.5.2.2.4, "Auxiliary Building Crane" to:

1. Add a description of a non-single failure proof chain hoist assembly that DEK intends to use for the NAC MAGNASTOR transportable storage canister (TSC) handling evolution that occurs in the auxiliary building. The chain hoist assembly is used to transfer a loaded TSC between the MAGNASTOR transfer cask (MTC) and vertical concrete cask (VCC) while the MTC is in a stack-up configuration atop the VCC.
2. Incorporate a new load drop analysis applicable to the use of this non-single failure proof chain hoist assembly.

The description to be added to the USAR is proposed to read as follows. A marked-up version of this USAR page is provided in Attachment 2.

> Certain cask handling activities performed away from the spent fuel pool involving the NAC MAGNASTOR secure lift system rely on an intermediate lift device (chain hoist assembly) between the AB crane hook and the transportable storage canister (TSC). This lift device is used to lift and lower a TSC (loaded or unloaded) when transferring it into or out of its vertical concrete cask (VCC) while the MAGNASTOR transfer cask (MTC) is in a stack-up configuration atop the VCC. The intermediate lift device is used for the purpose of transferring the TSC between the MTC and VCC while the MTC is attached to the AB crane (via the secure lift yoke). Maintaining attachment between the MTC and the AB crane by the secure lift yoke during transfer restrains the MTC and thereby avoids a free standing "stack-up" configuration.

To minimize the potential for a drop of a loaded TSC, the intermediate lift device is designed with enhanced safety features to ASME NUM-1-2007, Type IB standards for handling critical loads. The maximum critical load rating for the lift device is 50% of its ASME B30.16 design rating, providing an overall factor of safety of 10 to 1 for the maximum critical load. The design of the lifting device also includes redundant braking and two-blocking protection. Proof load testing of the device is performed at a minimum of 300% of the maximum critical load rating. Pre-use and annual inspections of the lifting device are performed in accordance with manufacturer's recommendations.

Although designed with enhanced safety features, the lift device does not fully comport to the guidance for a single failure proof handling system described in NUREG-0612. Therefore, a load drop analysis was performed, which concluded that the consequences of a potential drop of a loaded TSC into the concrete cask would be within acceptable limits for maintaining physical canister integrity, cooling, and subcriticality. The load drop analysis was approved in License Amendment [2xx] (Reference 11).

A new TRM Section 8.9.5, "MAGNASTOR Fuel Cask Handling Away from Spent Fuel Pool," is provided in Attachment 3 for information. This new TRM section governs the use of the non-single failure proof chain hoist assembly and ensures that the required parameters of the load drop analysis are maintained.

3.0 SYSTEM DESCRIPTION AND BACKGROUND

3.1 KPS USAR Fuel Handling System

The fuel handling system, described in KPS USAR Section 9.5, "Fuel Handling System," provides a safe and effective means of transporting and handling fuel until it leaves the plant after post-irradiation cooling. The system is designed to minimize the possibility of mishandling that could cause fuel damage and potential fission-product release. One of the major components of the fuel handling system is the single failure proof auxiliary building (AB) crane.

As stated in USAR Section 9.5.2.2.4, the AB crane is used for handling spent fuel shipping and transfer casks and is designed to minimize the possibility of dropping such a cask. The AB crane was upgraded from its original design by replacing the trolley with a single failure proof design and modifying the existing crane bridge. The replacement AB crane trolley, including new main and auxiliary hoists, is constructed to meet the guidance of NUREG-0612, Section 5.1.6 and NUREG-0554. The design, fabrication, inspection, and testing of the AB crane trolley is in accordance with NUREG-0554, Crane Manufacturer's Association of America Specification 70 (CMAA-70), 2004 Edition, and, in areas where NUREG-0554 or CMAA-70 does not provide guidance, ASME NOG-1-2004. The existing AB crane bridge was designed, fabricated, and qualified in accordance with the Electric Overhead Crane Institute Standard No. 61, American National Standard Institute Standard B-30.2.0, 1967 Edition (and Pioneer Service and Engineering Company Standard Specification for Powerhouse Overhead

Electrical Traveling Cranes). This crane upgrade was reviewed by NRC as documented in KPS License Amendment 200 (Reference 2). With the crane upgraded to single failure proof guidelines, a load drop accident was no longer considered credible. Therefore, a cask handling accident was not required to be included in the KPS USAR.

To protect the irradiated fuel in the spent fuel pool during heavy load lifts in or around the spent fuel pool, the AB crane lifting system meets the guidance in NUREG-0612, Section 5.1.6 as follows:

- Special lifting devices as defined in ANSI N14.6 meet the guidance in NUREG-0612, Section 5.1.6(1)(a) and ANSI N14.6-1993, as clarified in Attachment 5 of License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007).
- Lifting devices not specially designed are to meet the guidance in NUREG-0612, Section 5.1.6(1)(b) and ASME B30.9, "Slings," 2003, as clarified in Attachment 5 of License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007).
- Interfacing lift points meet the guidance in NUREG-0612, Section 5.1.6(3), as clarified in Attachment 5 of License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007).

3.2 NAC Secure Lift System

A diagram of the NAC secure lift system is shown in Figure 1. The NAC secure lift system consists of two integrated components, the secure lift yoke and the air driven chain hoist assembly. The secure lift yoke is used to move the MAGNASTOR transfer cask (MTC) from the cask decontamination area to the truck bay and position the MTC in the stack-up configuration atop its vertical concrete cask (VCC). The chain hoist assembly is used to raise/lower the loaded TSC into or out of its VCC while in the stack-up configuration on the Heavy Haul Trailer. The chain hoist assembly is also used to handle the TSC adapter plate away from the spent fuel pool.

The NAC secure lift system was specially designed to address vertical dry cask storage systems in the "stack-up" configuration. The advantages of this system include:

- Seismic Event: The secure lift system ensures that the MTC remains connected to the single failure proof crane by the secure lift yoke during the entire TSC transfer operation while in the stack-up configuration (lowering into or raising up from the VCC).
- Dose Reduction: The secure lift system reduces the crew size needed to perform the canister transfer operation. The need to place and continually reposition slings is eliminated. This coupled with remote operation and camera usage reduces occupational dose to workers.

- Industrial Safety: The secure lift system eliminates the need to use multi-leg sling sets and the associated hoist rings, turn-buckles and large, heavy and difficult to maneuver master links. This reduces the probability for human performance related rigging errors. The secure lift system also minimizes the potential for operator injury by reducing connection and disconnection operations.

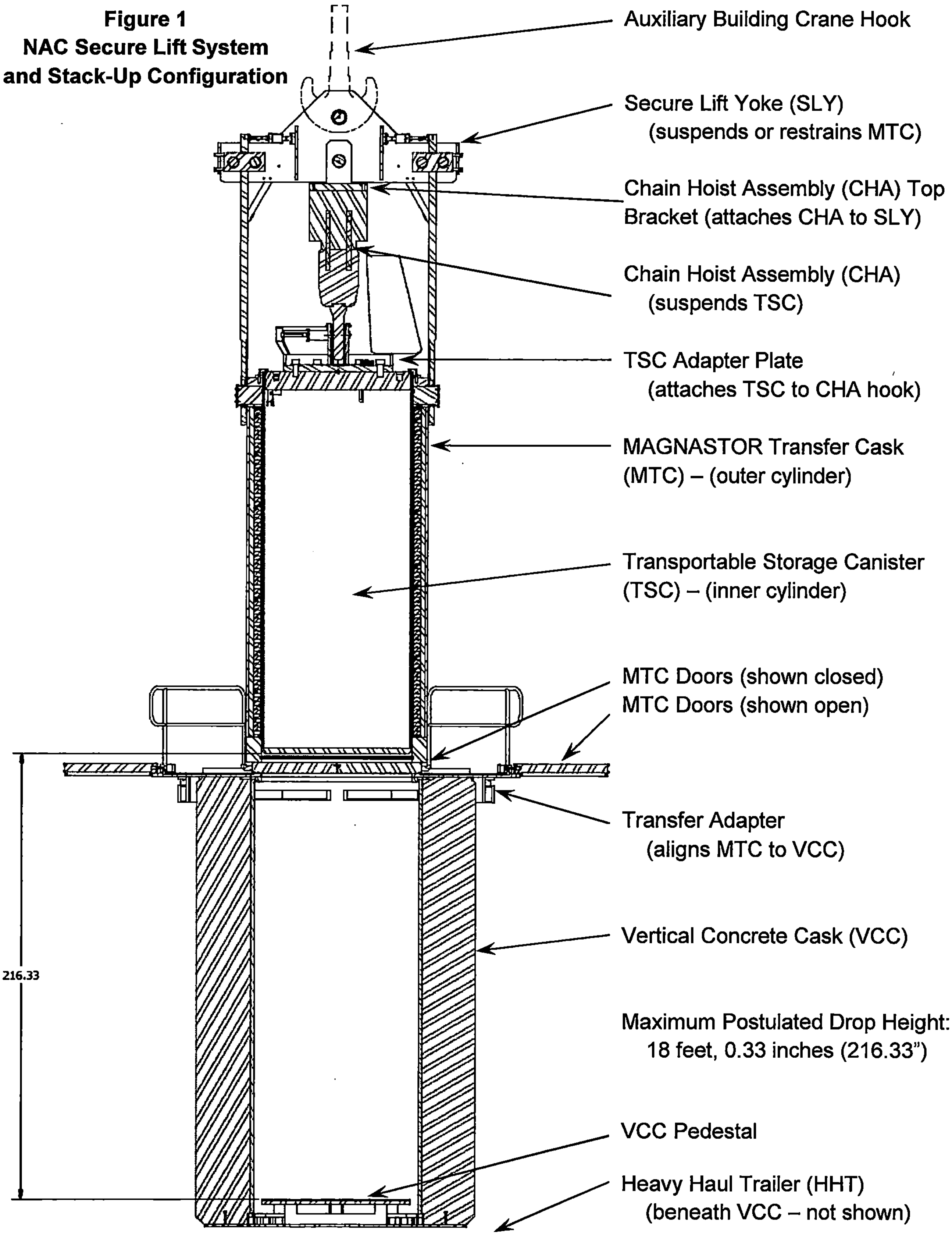
The secure lift yoke is designed to the guidance of NUREG-0612 and is used to support the MTC during lifts over the VCC. The secure lift yoke and the MTC are the primary NAC devices utilized to transport the sealed TSC into the stack-up configuration.

The chain hoist assembly does not conform to NUREG-0612 guidance as a single failure proof lifting device. It is used in the truck bay of the auxiliary building to raise and lower the TSC after a stabilized stack-up configuration is achieved. The stack-up configuration occurs about 28 feet away from the edge of the spent fuel pool, which precludes any physical contact between the TSC and the spent fuel pool in the highly unlikely event of a postulated TSC drop while using the chain hoist assembly. The chain hoist assembly is also used in the cask decontamination area and in the truck bay for handling the TSC adapter plate. The chain hoist assembly is not used to handle the TSC over or around the spent fuel pool.

Although the chain hoist assembly is not a single failure proof lifting device, it is conservatively designed with enhanced safety features that reduce the possibility of a load drop. Specifically:

- The chain hoist assembly has a design rated load of 110 tons, which is more than two times larger than the estimated MAGNASTOR system component load of 49 tons and two times the rated maximum critical load (MCL) of 55 tons. Since the system is designed for a safety factor of 5 times the design rated load, the overall factor of safety to the MCL is 10 to 1.
- The chain hoist assembly meets the requirements of ASME NUM-1, Type IB, critical load handling hoist standards.
- The chain hoist assembly has redundant braking comprised of an air actuated disc type brake (primary) and drive train braking (redundant).
- The chain hoist assembly has a controlled lowering speed of no greater than 9 inches per minute (field test results confirm 6 inches per minute lowering speed).
- The chain hoist assembly has redundancy on two-blocking protection via an upper limit switch (primary) and an air stall feature (redundant).
- The chain hoist assembly has been load tested to a minimum of 300% of the 55 ton MCL rating, which exceeds the requirements of ASME NUM-1.

Figure 1
NAC Secure Lift System and Stack-Up Configuration



3.3 NUREG-0612 Applicability to KPS

NUREG-0612 (Reference 3), Section 5.1.2, "Spent Fuel Pool Area - PWR," is applicable to KPS and lists four alternate guidelines for heavy load handling in the spent fuel pool area. NUREG-0612 states that, in addition to the general guidelines of Section 5.1.1, one of the four listed alternate guidelines of Section 5.1.2 should be satisfied. The first guideline recommends satisfying the single failure proof criteria of NUREG-0612, Section 5.1.6 for the overhead crane and associated lifting devices. The second and third guidelines involve implementing design features and administrative controls for non-single failure proof lifting systems to minimize the potential for a heavy load drop onto spent fuel in the spent fuel pool or onto equipment required for safe shutdown. The fourth guideline involves analyzing the effects of heavy load drops if the lifting system is not single failure proof and showing that the evaluation criteria of NUREG-0612, Section 5.1 are satisfied. The evaluation criteria of NUREG-0612 Section 5.1 are briefly summarized and addressed in Section 4 of this proposed amendment.

Regulatory Issue Summary (RIS) 2005-25 (Reference 4) clarifies the guidance related to the control of heavy loads contained in NUREG-0612. Among the acceptable heavy load control measures described in RIS 2005-25, which provide defense-in-depth for specific areas within nuclear power plants, is an analysis showing the consequences of a potential load drop are within acceptable limits. Such an analysis is described below.

4.0 TECHNICAL ANALYSIS

Spent Fuel Canister Handling Process/Use of Chain Hoist Assembly

In preparation for loading spent fuel into a NAC MAGNASTOR transportable storage canister (TSC), an empty TSC and MAGNASTOR transfer cask (MTC) are initially staged in the auxiliary building truck bay area. The empty MTC is first transferred to the cask decontamination area using the KPS auxiliary building (AB) crane (part of the KPS fuel handling system) and NAC in-pool lift yoke. The empty TSC is then placed into the MTC using the AB crane and slings. Both the truck bay and cask decontamination areas are away from the spent fuel pool and designated as safe load path areas. These areas, as well as the auxiliary building areas directly below, do not include any important to safety equipment or equipment needed for maintaining spent fuel pool cooling or water inventory.

The MTC containing the empty TSC is transferred into the spent fuel pool (SFP) cask loading area using the AB crane and NAC in-pool lift yoke. Spent fuel is loaded into the TSC using the KPS fuel handling bridge crane. Once loading of spent fuel into the TSC is complete, the TSC lid is positioned onto the TSC using the AB crane, the NAC in-pool lift yoke, and a sling set. Transfer of the MTC containing a loaded and unsealed TSC from the SFP to the cask decontamination area is performed using the KPS AB crane and the NAC in-pool lift yoke.

Canister processing operations in the cask decontamination area involve the placement of shielding and welding equipment onto the MTC and TSC using the AB crane and slings. After the TSC is processed, sealed (welded), and tested for confinement integrity, the chain hoist assembly is used to lift the TSC adapter plate to place it onto the TSC (the TSC adapter plate is used to attach the TSC to the chain hoist assembly hook for subsequent use). Transfer of the loaded and sealed TSC from the cask decontamination area into the stack-up configuration above its vertical concrete cask (VCC) is performed away from the spent fuel pool using the auxiliary building crane, MTC, and NAC secure lift yoke.

After the entire system is in the stack-up configuration (supported by the auxiliary building crane), the chain hoist assembly is used to lift the TSC off of the MTC doors approximately one-half inch. Following a five minute hold, the MTC doors are opened and the chain hoist assembly is used to lower the TSC into the VCC located on a heavy haul trailer in the truck bay. Once the TSC is in position on the VCC pedestal, the TSC adapter plate is unbolted from the TSC lid and the chain hoist assembly is used to lift the TSC adapter plate into the MTC to permit closure of the MTC shield doors. Throughout this entire operation, the TSC is confined inside the MTC or VCC. Furthermore, the MTC remains connected to the secure lift yoke, which is pinned to the hook of the auxiliary building crane. The chain hoist assembly is used for lowering the TSC from the MTC into the VCC (loading) or raising the TSC into the MTC from the VCC (unloading).

4.1 Load Drop Analysis Methodology and Assumptions

Certain cask handling activities performed away from the spent fuel pool involving the NAC MAGNASTOR secure lift system rely on a non-single failure proof chain hoist assembly between the auxiliary building (AB) crane hook and the TSC. Consequently, a potential drop of a loaded fuel canister is credible and a load drop analysis is required.

Section 3.3 of this proposed amendment discusses the four alternate guidelines listed in NUREG-0612 for heavy load handling in the spent fuel pool area, one of which is a load drop analysis. The evaluation criteria of NUREG-0612, Section 5.1, were considered when performing the load drop analysis in this case. Consistent with these evaluation criteria, and the specific conditions under which load handling with the non-single failure proof chain hoist assembly are conducted, DEK has addressed the following NUREG-0612, Section 5.1 criteria:

I. Release of Radioactive Materials from Damage to Spent Fuel
   - Addressed in Section 4.2.1, Canister Physical Integrity and Cooling
   - Addressed in Section 4.2.2, Floor Integrity
   - Addressed in Section 4.2.5, Radiological Consequences

II. Maintain Subcriticality of Fuel following Damage to Fuel and Fuel Storage Racks
   - Addressed in Section 4.2.4, Criticality Impact

III. Spent Fuel Pool Water Level from Damage to Spent Fuel Pool
   - Addressed in Section 4.2.3, Spent Fuel Pool Integrity

IV. Safe Shutdown Functions from Damage to Safe Shutdown Equipment
   - Not applicable to KPS (no safe shutdown equipment)

Considering that the TSC load handling activity with the chain hoist assembly is performed when the MTC is in a "stack-up" configuration atop the VCC and Heavy Haul Trailer (HHT), the characteristics of an otherwise unrestrained drop are as follows:

- Lifting or lowering of a loaded TSC with a chain hoist assembly is conducted for the purpose of transferring the TSC between the MTC and the VCC. Therefore, the postulated drop of the TSC is a vertical drop into the VCC positioned on the HHT.

- Suspending the MTC from the single failure proof auxiliary building crane results in a restrained stack-up configuration because failure of the single failure proof auxiliary building crane and secure lift yoke is not credible. Therefore, the MTC will not drop or tip over when suspended from the auxiliary building crane.

To minimize the potential consequences of a drop, the following parameters were established as initial conditions which would need to be satisfied prior to utilizing the chain hoist assembly for handling a loaded TSC.

- The VCC sits on a HHT during the transfer operation. The HHT is a uniquely designed trailer that is used to transport the empty or loaded VCC in a vertical position into and out of the auxiliary building. The height of the HHT for transfer operations is procedurally controlled so as to limit the height of the HHT deck to less than 24 inches above the floor surface (maximum VCC lift height as specified in the MAGNASTOR FSAR). Although not designed or credited as an impact limiting device, the HHT is maintained in position beneath the VCC consistent with the load drop analysis.

- The use of the chain hoist assembly is both procedurally restricted and physically constrained such that a loaded canister cannot be suspended higher than a maximum height of 216.33 inches (18 feet, 0.33 inches) above the VCC pedestal (as shown in Figure 1). Therefore, the maximum potential drop height for the loaded TSC is 216.33 inches (18 feet, 0.33 inches). This maximum lift height is bounded by the analyzed drop height of 220 inches.

- The gap between the bottom of the HHT box beam and top surface of the concrete floor is 3 to 4 inches.

Other input parameters used in the load drop analysis were based on design features of the affected equipment, which are controlled by other requirements (e.g., CoC, technical specifications, etc.). Detailed diagrams of cask handling configurations and areas, including the HHT, are provided in Attachment 4.

The TSC drop analysis concluded that the consequences of a potential drop of a loaded TSC into the VCC would be within acceptable limits for maintaining physical canister integrity, cooling and subcriticality. The load drop analysis is enclosed with this submittal. A related analysis demonstrating auxiliary building floor and spent fuel pool integrity under the conditions of the postulated drop is also enclosed. The results of these analyses, described in Section 4.2 below, confirm that the consequences of a potential drop of a loaded TSC into the VCC are within acceptable limits.

4.2 Analysis Results

4.2.1 Canister Physical Integrity and Cooling

This analysis (summarized in Section 8 of Enclosure 1) shows that the maximum stress in the TSC wall and the TSC lid weld satisfy the ASME Section III, Division I, Appendix F requirements and that the canister maintains its structural integrity. The safety factor for the TSC wall is 1.10 and for the TSC lid weld is 1.14. The canister maintains its structural integrity following the drop event and there is no breach of the confinement boundary.

The pedestal assembly of the VCC is crushed during the drop event. However, the plastic strain in the TSC shell is local only to the TSC bottom plate; therefore, there is no decrease in the radial gap between the TSC and the air inlet top plate. Additionally, there is no decrease in the height of the air inlet at the VCC liner. This allows continuous air flow through the VCC air inlet vents, along with adequate TSC cooling, to be maintained after the drop event.

4.2.2 Auxiliary Building Floor Integrity

The structural consequences of the postulated load drop of the TSC on the auxiliary building truck bay floor were analyzed (Enclosure 2). The analysis demonstrates that, although cracking of the concrete and yielding of the embedded reinforced steel occurs, the concrete floor in the truck bay will withstand the impact load due to the drop of a loaded TSC inside the VCC and remain stable with adequate ductility. The VCC and dropped TSC maintain a vertical (standing) configuration following the TSC drop (i.e., tip over does not occur).

4.2.3 Spent Fuel Pool Integrity

The chain hoist assembly is not used to handle a TSC over or around the spent fuel pool. The stack-up configuration occurs about 28 feet away from the edge of the spent fuel pool, which precludes any physical contact between the TSC and the spent fuel pool structure in the unlikely event of a postulated TSC drop. The spent fuel pool was demonstrated to withstand the tributary structural effects of a postulated drop of the loaded TSC inside the VCC and meet the acceptance criteria of applicable industry standards (Enclosure 2).

4.2.4 Criticality Impact

As discussed in NUREG-1864 (Reference 5), criticality is not physically possible within the TSC in the absence of a moderator. All water has been removed from the TSC and it has been backfilled with helium and seal welded at the time of the postulated load drop. Since the postulated TSC drop does not result in a canister breach, moderator intrusion is not possible and criticality is not a concern.

4.2.5 Radiological Consequences

The load drop analysis enclosed with this submittal demonstrates that a canister breach would not occur (Appendix E of Enclosure 1). As such, a drop of the TSC would result in no release of radioactive materials to the environment. Therefore, there are no radiological consequences resulting from a postulated TSC drop event.

4.3 Conclusions

Certain limited cask handling activities performed at KPS involving the NAC MAGNASTOR secure lift system rely on an intermediate lift device (chain hoist assembly) between the auxiliary building crane hook and the TSC. Although the chain hoist assembly is conservatively designed with enhanced safety features, it is not a single failure proof device. Consequently, a potential drop of a loaded fuel canister cannot be discounted and an analysis of the effects of such a load drop is required. Analyses have been performed to demonstrate that the consequences of a potential drop of a loaded TSC into the concrete cask would be within acceptable limits for maintaining physical canister integrity, cooling, and subcriticality. Furthermore, the analyses show that the spent fuel pool structure can withstand the tributary effects of the postulated load drop and still meet applicable industry code acceptance criteria and that the concrete floor structure will remain stable with adequate ductility. Therefore DEK concludes that the proposed amendment to add a limited TSC drop analysis to the KPS licensing basis is acceptable.

5.0 REGULATORY ANALYSIS

5.1 No Significant Hazards Consideration

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) requests an amendment to Facility Operating License DPR-43 for Kewaunee Power Station (KPS).

The proposed amendment would revise the KPS Updated Safety Analysis Report (USAR) Section 9.5.2.2.4, "Auxiliary Building Crane" to: 1) add a description of a non-single failure proof intermediate lifting device that DEK intends to use during a specific spent fuel cask handling activity in the auxiliary building, and 2) incorporate a new load drop analysis applicable to the use of this intermediate lifting device. The proposed change is being submitted to the NRC for approval prior to implementation, as required under 10 CFR 50.59(c)(2).

DEK has evaluated the proposed amendment to determine if a significant hazards consideration is involved by focusing on the three standards set forth in 10 CFR 50.92, "Issuance of Amendment," as discussed below:

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

   Response: No

   The probability of a heavy load drop onto fuel is unchanged by this amendment since the intermediate lift device is not used for handling loaded or unloaded spent fuel canisters in or around the spent fuel pool. Heavy load lifts in and around the spent fuel pool will continue to be performed per the current licensing basis.

   The proposed amendment has no effect on the capability of any plant systems, structures, and components (SSCs) to perform their design functions. The spent fuel pool is unaffected by the proposed amendment. The design function of the auxiliary building crane is not changed. Other lifting devices and interfacing lifting points associated with spent fuel cask handling are designed in accordance with applicable NRC guidance pertaining to single failure proof lifting systems. Therefore, the proposed amendment would not increase the likelihood of the malfunction of any plant SSC. The proposed amendment would have no effect on any of the previously evaluated accidents in the KPS USAR.

   Therefore, the proposed amendment does not involve a significant increase in the consequences of a previously evaluated accident.

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

   Response: No

   The proposed amendment does not affect cask handling activities in or around the KPS spent fuel pool. Drops of heavy loads will continue to be very improbable events. Use of a different type of equipment to lift spent fuel canisters does not involve any new or different kind of accident.

The proposed amendment does not involve a physical alteration of the plant. Similarly, the proposed amendment would not physically change any SSCs involved in the mitigation of any postulated accidents. The physical structure of the spent fuel canisters is not altered by this amendment.

The possibility of a heavy load drop onto fuel remains non-credible since the intermediate lift device is not used to handle spent fuel canisters in or around the spent fuel pool. Heavy load lifts in and around the spent fuel pool will continue to be performed per the current licensing basis. The proposed amendment does not impact safe shutdown equipment. The spent fuel pool, including its cooling and inventory makeup, is unaffected by the proposed amendment.

The current licensing basis (USAR Section 14.2.1) includes evaluations of the consequences of a fuel handling accident involving failure of fuel cladding. Postulation of a canister load drop creates the possibility of a new initiator of this previously evaluated accident (failure of fuel cladding) caused by the postulated non-mechanistic single failure of the intermediate lift device. The analysis concludes that the postulated drop of a canister loaded with fuel assemblies would not result in failure of canister integrity (and therefore there would be no radiological release). The consequences of a canister drop are bounded by the current licensing scenario of a fuel handling accident.

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

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

Response: No

Heavy load handling will continue to be conducted in accordance with NRC approved methods. Analysis of a postulated load drop of a loaded spent fuel canister demonstrates satisfactory outcomes.

The proposed amendment does not involve a change in the plant's design, configuration, or operation. The proposed amendment does not significantly affect either the way in which the plant structures, systems, and components perform their safety function or their design margins. Because there is no change to the physical design of the plant, there is likewise no significant change to any of these margins.

Therefore, the proposed amendment does not involve a significant reduction in a margin of safety.

Based on the above, Dominion Energy Kewaunee, Inc. concludes that the proposed amendment presents no significant hazards consideration under the standards set forth in 10 CFR 50.92(c), and, accordingly, a finding of "no significant hazards consideration" is justified.

5.2 Applicable Regulatory Requirements/Criteria

The US Atomic Energy Commission (AEC) issued their Safety Evaluation (SE) of the Kewaunee Power Station (KPS) on July 24, 1972 with supplements dated December 18, 1972 and May 10, 1973. The SE, Section 3.1, "Conformance with AEC General Design Criteria," described the conclusions the AEC reached associated with the General Design Criteria (GDC) in effect at the time. The AEC stated:

"The Kewaunee plant was designed and constructed to meet the intent of the AEC's General Design Criteria, as originally proposed in July 1967. Construction of the plant was about 50% complete and the Final Safety Analysis Report (Amendment No. 7) had been filed with the Commission before publication of the revised General Design Criteria in February 1971 and the present version of the criteria in July 1971. As a result, we did not require the applicant to reanalyze the plant or resubmit the FSAR. However, our technical review did assess the plant against the General Design Criteria now in effect and we are satisfied that the plant design generally conforms to the intent of these criteria."

As such, the appropriate GDC, from the Final Safety Analysis (Amendment 7), as updated and included in the KPS USAR, are excerpted below.

These GDC are summarized in USAR Section 1.3, "General Design Criteria", and discussed in detail in USAR Section 1.8, "Atomic Energy Commission (AEC) General Design Criteria".

Criterion 69 – Protection Against Radioactivity Release From Spent Fuel and Waste Storage

Provisions shall be made in the design of fuel and waste storage facilities such that no undue risk to the health and safety of the public could result from an accidental release of radioactivity (GDC 69).

All fuel storage and waste storage facilities are designed to prevent the release of undue radioactivity to the public. Fuel storage facilities are described in Chapter 9, waste storage facilities are described in Chapter 11 and analysis of potential accidents in these systems is included in Chapter 14.

USAR Section 9.5, Fuel Handling System

The fuel transfer canal and spent fuel storage pool are Class I reinforced concrete structures with Class I* seam welded stainless steel plate liners. These structures are designed to withstand the design basis earthquake loadings so that the liner prevents leakage even in the event the reinforced concrete develops cracks. All operating areas in the fuel storage facilities are ventilated. The exhausts of the ventilation system in the Waste Storage and Drumming Areas are monitored for radioactivity and are discharged via the vent through the top of the auxiliary building.

Irradiated fuel is handled with equipment designed to handle the spent fuel underwater until it is placed in a cask for shipment from the site.

The auxiliary building (AB) crane, which is used for handling spent fuel shipping and transfer casks, is designed to minimize the possibility of dropping such a cask. The AB crane was upgraded from its original design by replacing the trolley with a single failure proof design and modifying the existing crane bridge. The replacement AB crane trolley, including new main and auxiliary hoists, is constructed to meet the guidance of NUREG-0612, Section 5.1.6 and NUREG-0554.

The north spent fuel pool will be used for loading the spent fuel shipping/storage cask. Interlocks on the auxiliary building crane prevent the transport of heavy loads such as the shipping/storage cask over spent fuel.

To protect the irradiated fuel in the spent fuel pool during heavy load lifts in or around the spent fuel pool, the auxiliary building crane lifting system meets the guidance in NUREG-0612, Section 5.1.6 as follows:

- Special lifting devices as defined in ANSI N14.6 meet the guidance in NUREG-0612, Section 5.1.6(1)(a) and ANSI N14.6-1993, as clarified in Attachment 5 of License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007).
- Lifting devices not specially designed are to meet the guidance in NUREG-0612, Section 5.1.6(1)(b) and ASME B30.9, "Slings," 2003, as clarified in Attachment 5 of License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007).
- Interfacing lift points meet the guidance in NUREG-0612, Section 5.1.6(3), as clarified in Attachment 5 of License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007).

5.3 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.

6.0 ENVIRONMENTAL CONSIDERATION

A review has determined that the proposed amendment would change a requirement with respect to installation or use of a facility component located within the restricted area, as defined in 10 CFR 20, or would change an inspection or surveillance requirement. However, the proposed amendment does not involve (i) a significant hazards consideration, (ii) a significant change in the types or significant increase in the amounts of any effluent that may be released offsite, or (iii) a 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 need be prepared in connection with the proposed amendment.

7.0 REFERENCES

1. Letter from D. G. Stoddard (DEK) to NRC Document Control Desk, "Certification of Permanent Removal of Fuel from the Reactor Vessel," dated May 14, 2013. [ADAMS Accession No. ML13135A209]
2. Amendment No. 200 to Facility Operating License No. DPR-43 for the Kewaunee Power Station, dated November 20, 2008.
3. NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants," dated July 1980.
4. NRC Regulatory Issue Summary 2005-25: "Clarification of NRC Guidelines for Control of Heavy Loads," dated October 31, 2005.
5. NUREG-1864, "A Pilot Probabilistic Risk Assessment of a Dry Cask Storage System at a Nuclear Power Plant," dated March 2007.

ATTACHMENT 2

LICENSE AMENDMENT REQUEST 263: LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

MARKED-UP UPDATED SAFETY ANALYSIS REPORT PAGE (FOR INFORMATION)

AFFECTED USAR SECTION:

Section 9.5.2.2.4

(2-page excerpt)

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.

9.5.2.2.4 **Auxiliary Building Crane**

The auxiliary building (AB) crane, which is used for handling spent fuel shipping and transfer casks, is designed to minimize the possibility of dropping such a cask. The AB crane was upgraded from its original design by replacing the trolley with a single-failure-proof design and modifying the existing crane bridge. The replacement AB crane trolley, including new main and auxiliary hoists, is constructed to meet the guidance of NUREG-0612, Section 5.1.6 and NUREG-0554. The design, fabrication, inspection, and testing of the AB crane trolley is in accordance with NUREG-0554, Crane Manufacturer's Association of America Specification 70 (CMAA-70), 2004 Edition, and, in areas where NUREG-0554 or CMAA-70 does not provide guidance, ASME NOG-1-2004. The existing AB crane bridge was designed, fabricated, and qualified in accordance with the Electric Overhead Crane Institute Standard No. 61, American National Standard Institute Standard B-30.2.0, 1967 Edition (and Pioneer Service and Engineering Company Standard Specification for Powerhouse Overhead Electrical Traveling Cranes).

...

To protect the irradiated fuel in the spent fuel pool during heavy load lifts in or around the spent fuel pool, the auxiliary building crane lifting system meets the guidance in NUREG-0612, Section 5.1.6 as follows:

- Special lifting devices as defined in ANSI N14.6 meet the guidance in NUREG-0612, Section 5.1.6(1)(a) and ANSI N14.6-1993, as clarified in Attachment 5 of [License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007)].
- Lifting devices not specifically designated are to meet the guidance in NUREG-0612, Section 5.1.6(1)(b) and ASME B30.9, "Slings," 2003, as clarified in Attachment 5 of [License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007)].
- Interfacing lift points meet the guidance in NUREG-0612, Section 5.1.6(3), as clarified in Attachment 5 of [License Amendment Request 227, Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual (November 9, 2007)].

...

Certain cask handling activities performed away from the spent fuel pool involving the NAC MAGNASTOR secure lift system rely on an intermediate lift device (chain hoist assembly) between the AB crane hook and the transportable storage canister (TSC). This lift device is used to lift and lower a TSC (loaded or unloaded) when transferring it into or out of its vertical concrete cask (VCC) while the MAGNASTOR transfer cask (MTC) is in a stack-up configuration atop the VCC. The intermediate lift device is used for the purpose of transferring the TSC between the MTC and VCC while the MTC is attached to the AB crane (via the secure lift yoke). Maintaining attachment between the MTC and the AB crane by the secure lift yoke during transfer restrains the MTC and thereby avoids a free standing "stack-up" configuration.

To minimize the potential for a drop of a loaded TSC, the intermediate lift device is designed with enhanced safety features to ASME NUM-1-2007, Type IB standards for handling critical loads. The maximum critical load rating for the lift device is 50% of its ASME B30.16 design rating, providing an overall factor of safety of 10 to 1 for the maximum critical load. The design

[NOTE: For purposes of brevity, certain segments of information from USAR Section 9.5 are not reproduced here as they are not impacted or altered by this submittal.]

of the lifting device also includes redundant braking and two-blocking protection. Proof load testing of the device is performed at a minimum of 300% of the maximum critical load rating. Pre-use and annual inspections of the lifting device are performed in accordance with manufacturer's recommendations.

Although designed with enhanced safety features, the lift device does not fully comport to the guidance for a single failure proof handling system described in NUREG-0612. Therefore, a load drop analysis was performed, which concluded that the consequences of a potential drop of a loaded TSC into the concrete cask would be within acceptable limits for maintaining physical canister integrity, cooling, and subcriticality. The load drop analysis was approved in License Amendment [2xx] (Reference 11).

[NOTE: For purposes of brevity, certain segments of information from USAR Section 9.5 are not reproduced here as they are not impacted or altered by this submittal.]

ATTACHMENT 3

LICENSE AMENDMENT REQUEST 263: LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

TRM 8.9.5, "MAGNASTOR Fuel Cask Handling Away from Spent Fuel Pool" (FOR INFORMATION)

(3 pages)

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC

8.9 FUEL HANDLING OPERATIONS

8.9.5 MAGNASTOR Fuel Cask Handling Away from Spent Fuel Pool

TNC 8.9.5 Cask handling activities performed away from the spent fuel pool involving the NAC MAGNASTOR secure lift system may rely on an intermediate lift device (chain hoist assembly) between the auxiliary building crane hook and the transportable storage canister (TSC) only if:

a. The MAGNASTOR transfer cask (MTC) is in a stack-up configuration atop the vertical concrete cask (VCC), and

b. The intermediate lift device is used for the purpose of transferring the TSC between the MTC and VCC while the MTC is attached to the auxiliary building crane, and

c. The required parameters of a load drop analysis, concluding that the consequences of a potential drop of a loaded TSC into the VCC would be within acceptable bounds, are satisfied.

APPLICABILITY: Whenever a non-single failure proof intermediate lift device is being used to suspend a loaded TSC.

CONTINGENCY MEASURES

NONCONFORMANCES	CONTINGENCY MEASURES		RESTORATION TIME
A. TNC 8.9.5 not met.	A.1	Initiate action to suspend use of the intermediate lift device.	Immediately

TECHNICAL VERIFICATION REQUIREMENTS

VERIFICATION	FREQUENCY
None	N/A

BASES

BACKGROUND	Based on site-specific design considerations, the most appropriate method for transferring a loaded TSC into or out of a VCC (away from the spent fuel pool) involves lifting the TSC with an intermediate lift device that is configured between the auxiliary building overhead crane hook and the TSC. However, an intermediate lift device may not necessarily conform to the single failure proof guidance contained in NUREG-0612 (Reference 1), as clarified in Regulatory Issue Summary (RIS) 2005-25 (Reference 2). Therefore, a load drop analysis demonstrating satisfactory outcomes was performed. This load drop analysis was approved by the NRC in License Amendment xxx (Reference 4) as described in the USAR (Reference 5).
TNC and APPLICABILITY	This TNC requires that all three listed conditions be satisfied in order to allow performance of cask handling activities away from the spent fuel pool involving the NAC MAGNASTOR secure lift system that rely on an intermediate lift device (chain hoist assembly) between the auxiliary building crane hook and the TSC. The three conditions are: a. The MTC must be in a stack-up configuration atop the VCC (stack-up configurations are described in RIS 2015-13 (Reference 3)). b. The intermediate lift device is used for the purpose of transferring the TSC between the MTC and VCC while the MTC is attached to (and being restrained by) the auxiliary building crane. The stack-up configuration is used to facilitate lowering the TSC into the VCC (for storage within an independent spent fuel storage installation (ISFSI)) or to facilitate raising the TSC into the MTC. For the stack-up configuration used at KPS, the MAGNASTOR transfer cask (MTC) remains suspended from the auxiliary building crane throughout the evolution. Hence, this is a restrained stack-up configuration because the failure of the auxiliary building crane is not credible and therefore, the MTC will not drop or tip over when suspended from the auxiliary building crane. c. The parameters listed below from the load drop analysis concluding that the consequences of a potential drop of a loaded TSC into the VCC would be within acceptable bounds must be satisfied prior to using an intermediate lift device. RIS 2005-25 clarifies the guidance related to the control of heavy loads contained in NUREG-0612. Among the acceptable heavy load control measures described in RIS 2005-25, which provide defense-in-depth for specific areas within nuclear power plants, is a

BASES

load drop analysis that demonstrates the consequences of a potential load drop are within acceptable bounds.

The load drop analysis was approved by the NRC in License Amendment xxx. This analysis relied on the following parameters as inputs.

- The VCC sits on a heavy haul trailer during the lifting evolution.
- The use of the chain hoist assembly is both procedurally restricted and physically constrained such that a loaded TSC can only be lifted to a maximum height of 216.33 inches (18 feet, 0.33 inches) above the VCC pedestal.
- The gap between the bottom of the heavy haul trailer box beam and the top surface of the concrete floor is 3 to 4 inches.

The requirements of TNC 8.9.5 apply whenever a non-single failure proof intermediate lift device is being used to suspend a loaded TSC. These requirements do not apply to handling an unloaded TSC away from the spent fuel pool because that activity is performed without spent fuel and therefore would have no impact on fuel safety.

CONTINGENCY MEASURES

A.1

If TNC 8.9.5 is not met, actions are immediately needed to place the TSC in a safe condition and suspend further use of the intermediate lift device until compliance with TNC 8.9.5 is restored.

TECHNICAL VERIFICATION REQUIREMENTS

There are no TECHNICAL VERIFICATION REQUIREMENTS associated with TRM 8.9.5.

REFERENCES

1. NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants", dated July 1980
2. NRC Regulatory Issue Summary 2005-25: Clarification of NRC Guidelines for Control of Heavy Loads, dated October 31, 2005
3. NRC Regulatory Issue Summary 2015-13, "Seismic Stability Analysis Methodologies For Spent Fuel Dry Cask Loading Stack-Up Configuration", dated November 12, 2015
4. License Amendment xxx
5. USAR 9.5.2.2.4, Auxiliary Building Crane

ATTACHMENT 4

LICENSE AMENDMENT REQUEST 263: LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

CASK HANDLING CONFIGURATION DIAGRAMS

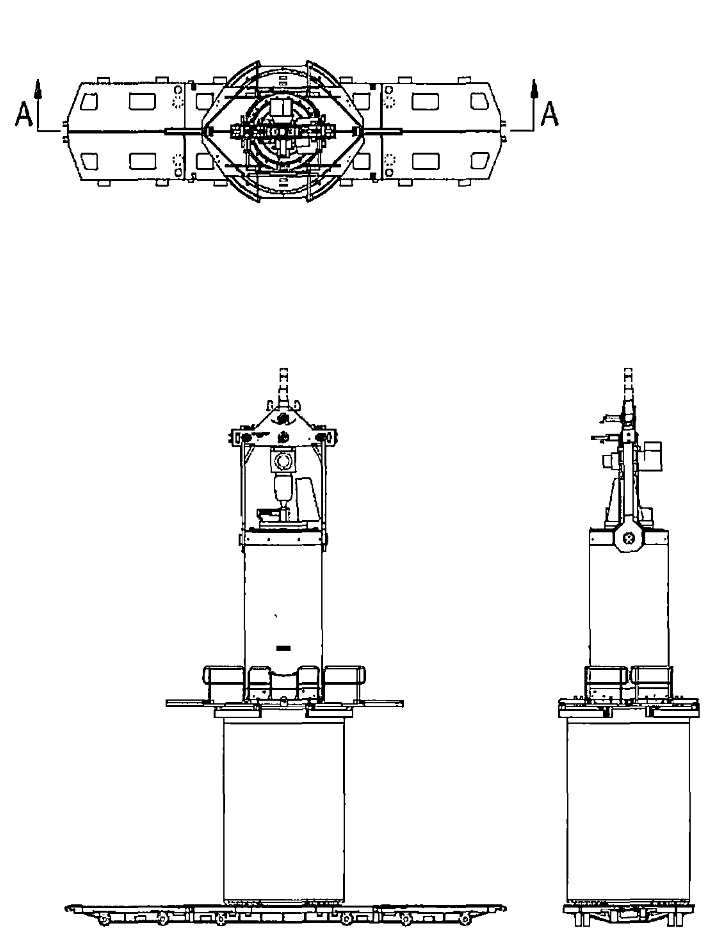
- **Diagram of Stack-Up Configuration and Heavy Haul Trailer**
- **Diagram of Auxiliary Building Cross Section**

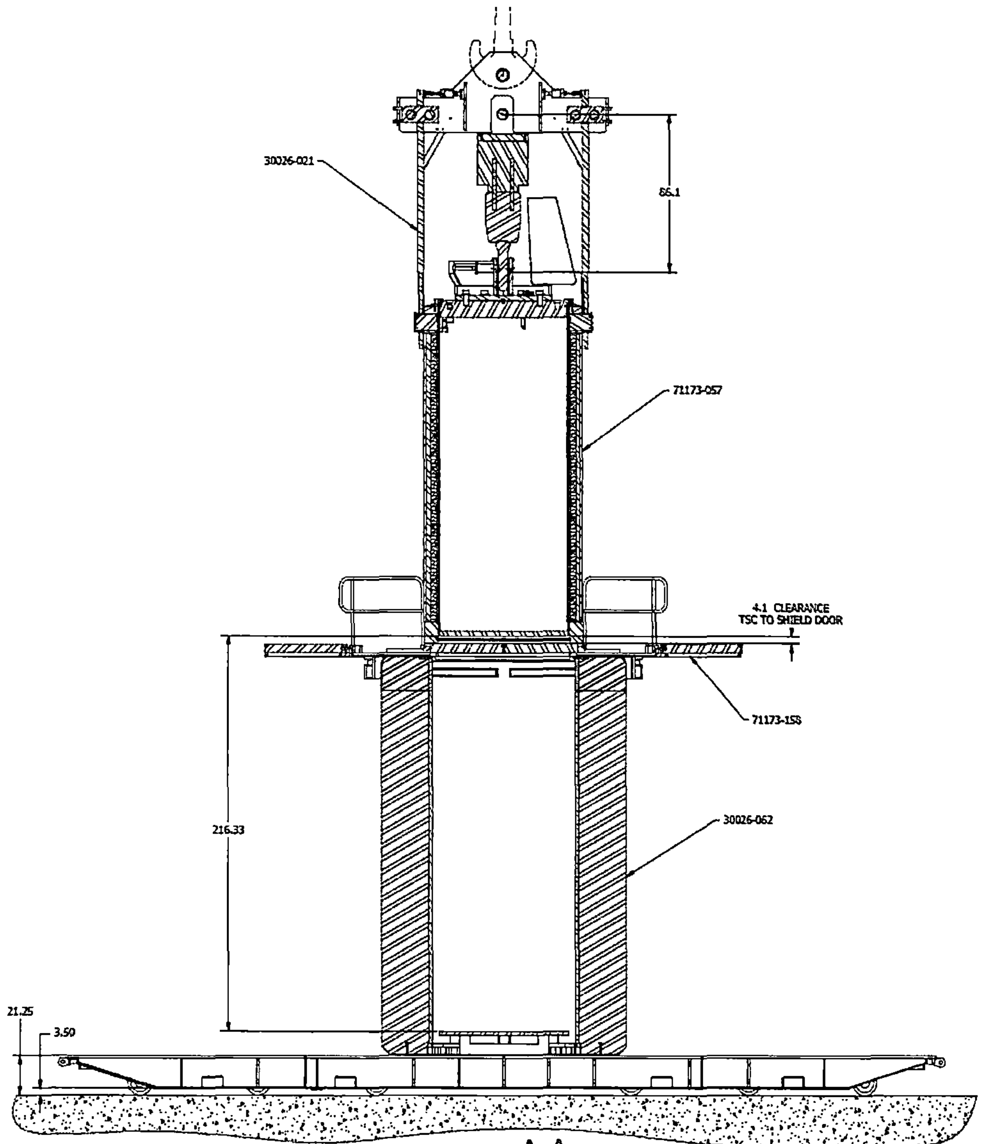
(2 pages)

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.

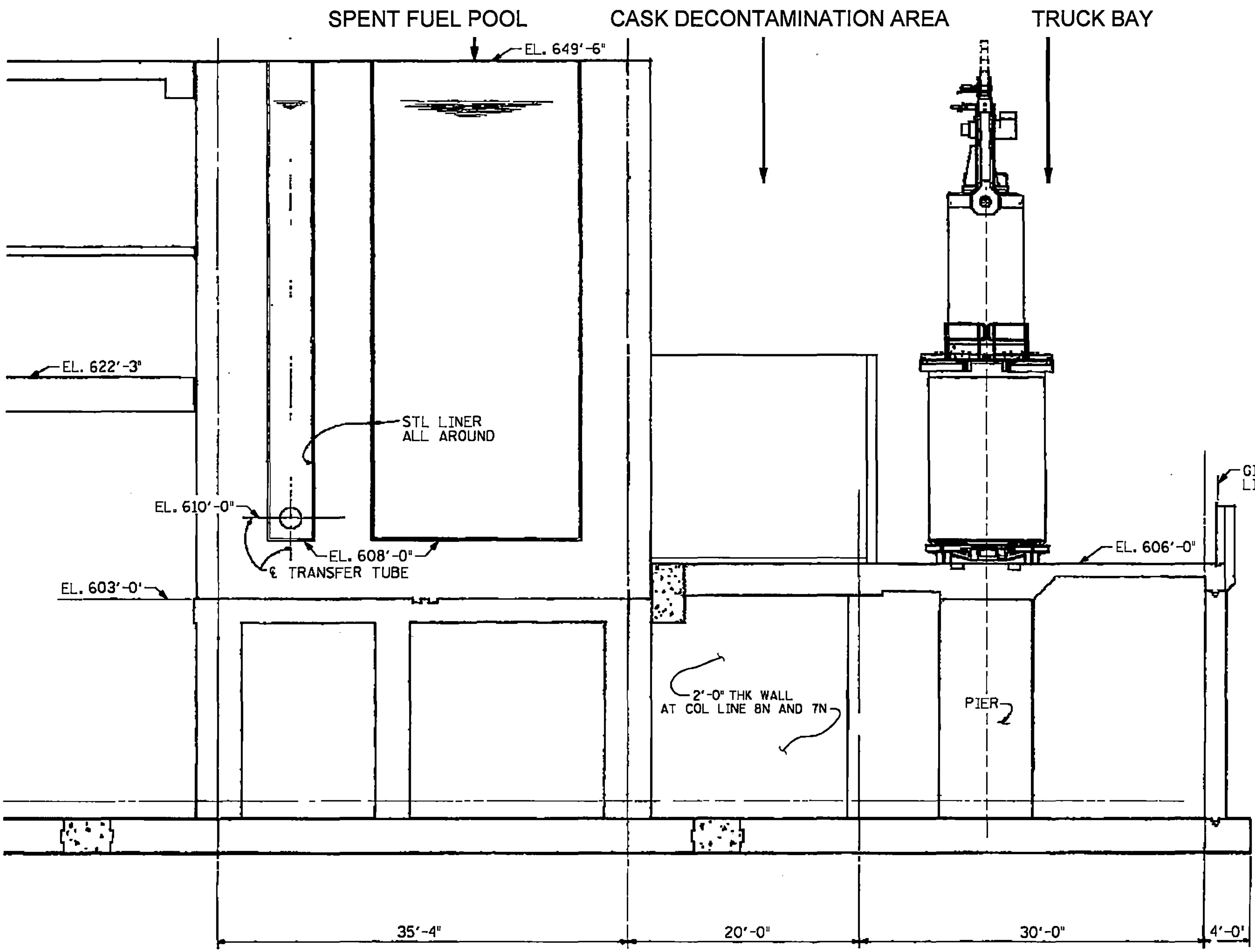
Diagram of Stack-Up Configuration and Heavy Haul Trailer

Serial No. 16-245





SECTION A-A
SCALED


SPENT FUEL POOL
CASK DECONTAMINATION AREA
TRUCK BAY
EL. 649'-6"
EL. 622'-3"
STL LINER ALL AROUND
EL. 610'-0"
EL. 608'-0"
℄ TRANSFER TUBE
EL. 603'-0'
GIRT LINE
EL. 606'-0"
2'-0" THK WALL AT COL LINE 8N AND 7N
PIER
35'-4"
20'-0"
30'-0"
4'-0'

ENCLOSURE 4

LICENSE AMENDMENT REQUEST 263:
LOAD DROP ANALYSIS FOR SPENT FUEL CASK HANDLING OPERATIONS

NAC International Affidavit Pursuant to 10 CFR 2.390

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.

NAC INTERNATIONAL
AFFIDAVIT PURSUANT TO 10 CFR 2.390

George Carver (Affiant), VP Engineering and Licensing, of NAC International, hereinafter referred to as NAC, at 3930 East Jones Bridge Road, Norcross, Georgia 30092, being duly sworn, deposes and says that:

1. Affiant has reviewed the information described in Item 2 and is personally familiar with the trade secrets and privileged information contained therein, and is authorized to request its withholding.

2. The information to be withheld includes the following NAC Proprietary Information that is being provided in support of an upcoming license amendment request by Kewaunee Power Station.

   - NAC Calculation 30026-2025, "Evaluation of TSC Drop into VCC on the Heavy Haul Trailer", Revision 1 and data flash drive 1 of 1
   - Dominion Calculation C12036, "Structural Consequences for NAC Cask Drop in the Auxiliary Building Truck Bay", Revision 0, Figures 30, 35, 47, and Appendix 17.3, Figure I.3-1

   NAC is the owner of this information that is considered to be NAC Proprietary Information.

3. NAC makes this application for withholding of proprietary information based 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 10 CFR Part 9.17(a)(4), 2.390(a)(4), and 2.390(b)(1) for "trade secrets and commercial financial information obtained from a person, and privileged or confidential" (Exemption 4). The information for which exemption from disclosure is herein sought is all "confidential commercial information," and some portions may also qualify under the narrower definition of "trade secret," within the meanings assigned to those terms for purposes of FOIA Exemption 4.

4. Examples of categories of information that 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 competitors of NAC, without license from NAC, constitutes a competitive economic advantage over other companies.

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

   c. Information that reveals cost or price information, production capacities, budget levels or commercial strategies of NAC, its customers, or its suppliers.

   d. Information that reveals aspects of past, present or future NAC customer-funded development plans and programs of potential commercial value to NAC.

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

   The information that is sought to be withheld is considered to be proprietary for the reasons set forth in Items 4.a, 4.b, and 4.d.

5. The information to be withheld is being transmitted to the NRC in confidence.

6. The information sought to be withheld, including that compiled from many sources, is of a sort customarily held in confidence by NAC, and is, in fact, so held. This information has, to the best of my knowledge and belief, consistently been held in confidence by NAC. 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 Items 7 and 8 following.

7. Initial approval of proprietary treatment of a document/information is made by the Vice President, Engineering, the Project Manager, the Licensing Specialist, or the Director, Licensing – the persons most likely to know the value and sensitivity of the information in relation to industry knowledge. Access to proprietary documents within NAC is limited via "controlled distribution" to individuals on a "need to know" basis. The procedure for external release of NAC proprietary documents typically requires the approval of the Project Manager based on a review of the documents for technical content, competitive effect and accuracy of the proprietary designation. Disclosures of proprietary documents outside of NAC are limited to regulatory agencies, customers and potential customers and their agents, suppliers, licensees and contractors with a legitimate need for the information, and then only in accordance with appropriate regulatory provisions or proprietary agreements.

8. NAC has invested a significant amount of time and money in the research, development, engineering and analytical costs to develop the information that is sought to be withheld as proprietary. This information is considered to be proprietary because it contains detailed descriptions of analytical approaches, methodologies, technical data and/or evaluation results not available elsewhere. The precise value of the expertise required to develop the proprietary information is difficult to quantify, but it is clearly substantial.

   Public disclosure of the information to be withheld is likely to cause substantial harm to the competitive position of NAC, as the owner of the information, and reduce or eliminate the availability of profit-making opportunities. The proprietary information is part of NAC's comprehensive spent fuel storage and transport technology base, and its commercial value extends beyond the original development cost to include the development of the expertise to determine and apply the appropriate evaluation process. The value of this proprietary information and the competitive advantage that it provides to NAC would be lost if the information were disclosed to the public. Making such information available to other parties, including competitors, without their having to make similar investments of time, labor and money would provide competitors with an unfair advantage and deprive NAC of the opportunity to seek an adequate return on its large investment.

NAC INTERNATIONAL
AFFIDAVIT PURSUANT TO 10 CFR 2.390 (continued)

STATE OF GEORGIA, COUNTY OF GWINNETT

Mr. George Carver, being duly sworn, deposes and says:

That he has read the foregoing affidavit and the matters stated herein are true and correct to the best of his knowledge, information and belief.

Executed at Norcross, Georgia, this 25th day of July 2016.

George Carver
VP Engineering and Licensing
NAC International

Subscribed and sworn before me this 25th day of July, 2016.

Notary Public