Dominion Energy Kewaunee, Inc.
5000 Dominion Boulevard, Glen Allen, VA 23060

Dominion

June 2, 2008

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

Serial No. 08-0113
LIC/JF/R4
Docket No.: 50-305
License No. DPR-43

DOMINION ENERGY KEWAUNEE, INC.
KEWAUNEE POWER STATION
RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING LICENSE AMENDMENT REQUEST 227, RELOCATION OF SPENT FUEL POOL CRANE TECHNICAL SPECIFICATION TO TECHNICAL REQUIREMENTS MANUAL

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) submitted a request for approval of a proposed amendment to the Kewaunee Power Station (KPS) Technical Specifications (TS) (reference 1). The proposed amendment would modify the KPS TS which currently restricts handling or placement of heavy loads over or in the spent fuel pools and relocate the modified requirements to a licensee-controlled document, the KPS Technical Requirements Manual (TRM).

Subsequently, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) regarding the proposed amendment (reference 2). The RAI questions and associated DEK responses are provided in attachment 1 to this letter. Supplemental information is provided in attachment 2 to this letter.

The attached responses and supplemental information do not change the conclusions of the no significant hazards determination in reference 1.

In the original amendment request (reference 1), DEK requested NRC approval by May 30, 2008. DEK would like to change the requested approval date for this license amendment request (LAR) to October 31, 2008. The reason for requesting approval by October 31, 2008 is to facilitate using the single-failure-proof crane for removal of interferences in the spent fuel pool. Removal of these interferences are required in order to maintain our current schedule for spent fuel cask loading and relocation of spent fuel to an independent spent fuel storage installation.

Spent fuel cask loading requires lifting spent fuel casks of approximately 105 tons into and out of the spent fuel pool using the auxiliary building (AB) crane. The AB crane cannot be seismically qualified with such heavy loads using currently approved methods. To address this problem, DEK submitted LAR 234 (reference 3) which requested approval of a change in methodology for the seismic analysis of the AB crane. However, as a result of unresolved issues with the proposed new methodology, LAR 234 was withdrawn appending development of a new LAR.

The new LAR will propose a seismic analysis methodology which is different from that currently licensed for use at KPS. NRC approval will be needed for this change in methodology for the AB crane seismic analysis. However, approval of the change in methodology for the AB crane seismic analysis is not needed to use the single-failure-proof crane for lifting lighter loads (loads up to 50 tons) such as is needed to address the interferences in the spent fuel pool discussed above. Acceptable seismic analysis results for the upgraded AB crane were obtained for loads up to 50 tons using the presently approved methodology. This seismic analysis method was reviewed in accordance with 10 CFR 50.59, and DEK determined prior NRC approval was not required when the crane load is limited to 50 tons.

Therefore, in order to facilitate use of the single-failure-proof crane for removing interferences in the spent fuel pool and maintaining our current schedule for spent fuel cask loading, DEK requests that the approval date for LAR 227 be changed from May 30, 2008 to October 31, 2008. DEK has included a commitment in this response that would prohibit the movement of loads greater than 50 tons with the new single-failure-proof crane until a change of methodology is approved by NRC. No change in the implementation schedule for LAR 227 is proposed. Additional details related to this request are provided in Attachment 2.

A complete copy of this submittal has been transmitted to the State of Wisconsin as required by 10 CFR 50.91(b)(1).

If you have any questions or require additional information, please contact Mr. Gerald Riste at (920) 388-8424.

Very truly yours,

William R. Matthews
Senior Vice President - Nuclear Operations

COMMONWEALTH OF VIRGINIA)
)
COUNTY OF HENRICO)

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

Acknowledged before me this 2ND day of June, 2008.

My Commission expires: August 31, 2008.

MARGARET B. BENNETT
Notary Public 354302
Commonwealth of Virginia
My Commission Expires Aug 31, 2008

Margaret B. Bennett
Notary Public

Attachments:

1. Response to NRC Request for Additional Information Regarding Kewaunee License Amendment Request 227
2. Supplemental Information for Kewaunee License Amendment Request 227

Commitments made by this letter:

1. DEK will place a restriction in the Kewaunee procedure governing the use of the auxiliary building crane prohibiting the use of synthetic slings for heavy load lifts with the auxiliary building crane when this crane is in the "Cask Handling" or "Override" modes of operation.
2. For the auxiliary building crane bridge welds whose failure could result in a drop of the critical load, DEK will perform nondestructive examinations (NDE) at least once every four years following completion of initial cold proof load testing of the auxiliary building crane.
3. DEK will not perform a heavy lift greater than 50 tons using the Auxiliary Building crane. This commitment will be superseded when a seismic analysis, using NRC approved methods, demonstrates acceptable results are achieved for the auxiliary building crane and establishes a new limit based on lifting heavy loads greater than 50 tons.

References:

1. Letter from Gerald T. Bischof (DEK) to Document Control Desk, "License Amendment Request 227 – Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual," dated November 9, 2007 (ADAMS Accession No. ML073170705).
2. Letter from Patrick D. Milano (NRC) to D. A. Christian (DEK), "Kewaunee Power Station – Request for Additional Information Regarding Relocating Requirements for Spent Fuel Pool Crane System (TAC NO. MD7301)," dated February 22, 2008 (ADAMS Accession No. ML080520273).
3. Letter from Gerald T. Bischof (DEK) to Document Control Desk, "License Amendment Request 234 – Request for Review and Approval of Methodology Change Regarding Auxiliary Building Crane Upgrade," dated November 9, 2007 (ADAMS Accession No. ML073180499).

cc: Regional Administrator, Region III
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ATTACHMENT 1

RESPONSE TO NRC REQUEST FOR ADDITIONAL INFORMATION REGARDING KEWAUNEE LICENSE AMENDMENT REQUEST 227

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.

Response to NRC Request for Additional Information Regarding Kewaunee License Amendment Request 227

Pursuant to 10 CFR 50.90, Dominion Energy Kewaunee, Inc. (DEK) submitted a request for approval of a proposed amendment to the Kewaunee Power Station (KPS) Technical Specifications (TS) (reference 1). The proposed amendment would modify the KPS TS by restricting handling or placement of heavy loads over or in the spent fuel pools and relocating the modified requirements to a licensee-controlled document, the KPS Technical Requirements Manual (TRM).

Subsequently, the Nuclear Regulatory Commission (NRC) transmitted a request for additional information (RAI) regarding the proposed amendment (reference 2). The RAI questions and associated DEK responses are provided below.

NRC Question 1

In Attachment 5, "NUREG-0612 Compliance Matrix for Upgraded KPS AB Crane Lifting System," to the November 9, 2007, application, DEK describes conformance to guidance contained in NUREG-0612, Section 5.1.6(1)(b), regarding the use of slings. In that matrix item, DEK states that slings made of metallic or synthetic material may be used in making heavy load lifts with the Kewaunee Power Station (KPS) auxiliary building crane system, based on the nature of the lift and the lifting location.

Revision 1 to NRC Standard Review Plan Section 9.1.5, "Overhead Heavy Load Handling Systems," Revision 1, dated March 2007, provides guidance specifying that slings used with single-failure-proof handling systems should satisfy the criteria of American Society of Mechanical Engineers (ASME) Code B30.9-2003, "Slings," and be constructed of metallic material (chain or wire rope). As described in NRC Regulatory Issue Summary 2005-25, Supplement 1, "Clarification of Control of Heavy Loads," May 29, 2007, the intent of specifying metallic sling material is to reduce the potential for a single rigging error (i.e., failure of sling protection material to prevent cutting of lower durability synthetic slings) to result in the drop of a heavy load that could threaten the safety of stored fuel in the spent fuel pool or the capability to safely shutdown the reactor and maintain it in a safe shutdown condition.

Clarify how the nature of the lift and the lifting location will influence the selection of slings (or the use of special lifting devices instead of slings) to satisfy the intent of the guidance.

Response:

The Kewaunee auxiliary building (AB) crane controls have two keyed switches (electrical interlocks) that control the operation of the crane. One keyed three-position-switch controls the operation of the AB crane with position and speed restrictions. The other keyed switch overrides these restrictions.

The keyed three-position switch has positions labeled "Normal," "New Fuel," and "Cask Handling." The operation of the crane in these different modes is discussed in Table 1.

Table 1
Auxiliary Building Crane Mode Switch Operation

Mode	Operation
Normal	Restricts operation of the auxiliary building crane so that the main and auxiliary hooks cannot cross over the new fuel pit, spent fuel pool 1A and spent fuel pool 1B, that portion of the fuel transfer canal where spent fuel is stored, and an area on the east side of the auxiliary building below which is located equipment needed to shutdown the reactor.
New Fuel	Restricts operation of the auxiliary building crane so that the main and auxiliary hooks cannot cross over spent fuel pool 1A, that portion of the fuel transfer canal where spent fuel is stored, and an area on the east side of the auxiliary building, below which is located equipment needed to shutdown the reactor. However, to gain access to the new fuel pit with the auxiliary hook, the main hook does cross approximately 2 feet into the southern edge of spent fuel pool 1B. The controls also permit the main hook to come within approximately 2 feet of the eastern edge of spent fuel pool 1B.
Cask Handling	Restricts operation of the auxiliary building crane so that the main and auxiliary hooks cannot cross over the new fuel pit, spent fuel pool 1B, a majority of spent fuel pool 1A, that portion of the fuel transfer canal where spent fuel is stored, and an area on the east side of the auxiliary building, below which is located equipment needed to shutdown the reactor. An access corridor, large enough to place a spent fuel cask into the location designated for spent fuel cask loading operations, is allowed over spent fuel pool 1A.

The only AB crane operating modes where either crane hook can be located above the spent fuel pool is in the "Cask Handling" and "New Fuel" modes.

In the "Normal" mode, neither hook can traverse over areas where spent fuel is stored or over areas below which is located equipment needed to shutdown the reactor and maintain it in a safe shutdown condition. Electrical interlocks prevent operation over the spent fuel pools, in this mode.

In the "Cask Handling" mode, the restricted area boundary and electrical interlock boundary is changed to allow introduction of a spent fuel cask into the south-west quadrant of spent fuel pool 1A. Although the crane can traverse over the spent fuel pool, it cannot traverse over spent fuel stored in the pool, only the spent fuel that has been placed into the spent fuel cask.

In the "New Fuel" mode, the auxiliary hook is used to handle new fuel (moving one assembly at a time does not meet the heavy load definition). A portion of the main hook can traverse over spent fuel along the southern edge of spent fuel pool 1B when new fuel is loaded into the new fuel pit location closest to the spent fuel pool. The main hook traverses above the spent fuel because spent fuel pool 1B and the new fuel pit are located close together. The distance between these storage locations is approximately 3 feet. The distance between the auxiliary and main hook centerline is 4 feet 6 inches. Therefore, when the auxiliary hook (southern most hook) is used to place new fuel in the northern-most location of the new fuel pit, the main hook traverses over the southern part of spent fuel pool 1B with the center of the main hook approximately one foot into the pool.

Also in the "New Fuel" mode, the auxiliary hook may be used to remove the fuel transfer canal gate (a heavy load) along the east side of spent fuel pool 1B[#]. When the fuel transfer canal gate is being inserted or removed, the gate comes to within approximately 4 feet of the east edge of spent fuel pool 1B, which places the main hook within 2 feet of the east edge of the pool. To compensate for these reduced margins, DEK does not allow use of the main hook for lifts in the "New Fuel" mode.

Therefore, the "Cask Handling" mode is the only mode where a single-failure-proof handling system is required.

The boundary limit between the spent fuel pool and safe load paths is a minimum of 5 feet versus the NUREG-0612, section 5.1.2(2)(a) minimum limit of 15 feet. This boundary limit is based on previous correspondence with the NRC* (reference 3, section 2.2-4). The one exception to these boundary limits is when in the "New Fuel" mode as indicated below.

Current procedural restrictions do not allow operation of the AB crane in the "Cask Handling" mode. These restrictions will remain in place until approval of this LAR is received from the NRC. AB crane operation is currently permitted in the "New Fuel"

[#] Note: Potential drops of the fuel transfer canal gate and spent fuel pool divider gates were identified to the NRC under letter dated December 23, 1982. See section 2.1.2, item 20 for details. These drop scenarios were evaluated such that the damage was less than the damage from a turbine missile accident. The NRC stated in a letter and Technical Evaluation Report dated March 16, 1984, that removal of these gates and the evaluation "complies with Interim Protection Measure 1."

* Note: The NRC never issued a final Safety Evaluation on this submittal. A draft Safety Evaluation was issued on June 13, 1984. Subsequently, Generic Letter 85-11 was issued on June 28, 1985, which stated that further action under NUREG-0612, Phase II was no longer required and further review of heavy loads was no longer necessary.

mode, because only one fuel assembly is handled at a time, meeting the requirements of current TS 3.8.a.7 and the fuel transfer canal gate drop analysis has been approved by the NRC. Once this LAR is approved, DEK will place a restriction in the KPS procedure governing the use of the AB crane when performing heavy lifts over spent fuel pool 1A. This restriction will prohibit the use of synthetic slings for handling heavy loads when the crane is operating in the "Cask Handling" mode of operation.

The other keyed control switch for the auxiliary building crane is the "Override" switch. This switch overrides the crane limit switches which prevent either of its hooks from being positioned above either spent fuel pool, that portion of the fuel transfer canal that contains spent fuel assemblies. Similar to the restriction placed in the crane use procedure for operation in the "Cask Handling" mode, DEK will place a restriction on the use of synthetic slings for heavy load lifts when this keyed control switch is in the override position.

Table 2 is provided as follows to simplify and summarize the licensing bases upon approval of this amendment request, which includes the application of single-failure-proof AB crane features and the use of electrical interlocks and safe load paths.

Table 2 Auxiliary Building Crane Licensing Bases	
Mode/Switch	**Licensing Bases Operations**
Normal	In this mode, the AB crane hooks cannot traverse over spent fuel, the spent fuel pools, or areas above equipment needed to shutdown the reactor. Therefore, the electrical interlocks and safe load paths provide protection of the spent fuel from damaged by a heavy load drop. The single-failure-proof features of the AB crane are not needed for protection in this mode. No restriction on the use of slings in this mode is necessary. Synthetic slings may be used when the AB crane is operating in this mode.
New Fuel	In this mode, AB crane movement is restricted as in the "Normal" mode except that the crane main hook may traverse approximately 2 feet over spent fuel along the southern edge of spent fuel pool 1B or within 2 feet of the east side of spent fuel pool 1B. Therefore, no heavy loads may be carried by the main hook in this mode. If a heavy load is handled in this mode then the load is to be handled using the auxiliary hook. No portion of the heavy load may extend over areas that contain spent fuel. The keyed switch electrical interlocks and the safe load paths are relied on for protection of the spent fuel. Synthetic slings may be used when the AB crane is operating in this mode.
Cask Handling	In this mode, the AB crane movement is restricted as in the "Normal" mode except that the crane may traverse into spent fuel pool 1A to the cask loading area. The single-failure-proof features are required when in this mode. Use of synthetic slings is prohibited when the crane is operating in this mode.
Override	In this mode, the AB crane may traverse into spent fuel pool 1A, spent fuel pool 1B, and the portion of the fuel transfer canal that contains spent fuel assemblies. The single-failure-proof features are required when in this mode. Use of synthetic slings is prohibited when the crane is operating in this mode.

Based upon the discussion above, DEK makes the following commitment:

DEK will place a restriction in the Kewaunee procedure governing the use of the auxiliary building crane prohibiting the use of synthetic slings for heavy load lifts with the auxiliary building crane when this crane is in the "Cask Handling" or in the "Override" modes of operation.

NRC Question 2

In Attachment 6, "NUREG-0554 Compliance Matrix for Upgraded KPS AB Crane Lifting System," to the application, DEK describes conformance to guidance contained in NUREG-0554, "Single-Failure-Proof Cranes for Nuclear Power Plants," Section 2.4, regarding material properties of crane structural components. In that matrix item, DEK states that the welds on the existing bridge structure, whose failure could result in the drop of the critical load, were subject to nondestructive examination (NDE) after cold proof load testing.

Section 2.4 of NUREG-0554 provides guidance specifying that welds whose failure could result in the drop of the critical load should be subject to NDE, and NDE of critical areas should be repeated at intervals.

Clarify the standards and methods employed in the conduct of the NDE. Describe the frequency and type of repeat inspections that will be performed to verify continued structural integrity of the crane bridge.

Response:

Section 2.4 of NUREG-0554, "Single Failure Proof Cranes for Nuclear Power Plants," provides guidance specifying that welds whose failure could result in the drop of the critical load should be subject to NDE, and NDE of critical areas should be repeated at intervals of four years or less.

The type of weld inspection used for each of the critical welds was determined using the guidance provided in ASME NOG-1-2004 (reference 4), Table 7200-1. American Welding Society (AWS) D1.1-2004, "Structural Welding Code – Steel," was used for the inspection methodology and acceptance criteria.

ASME NOG-1-2004 was selected based upon NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," Section 9.1.5, "Overhead Heavy Load Handling Systems." NUREG-0800, Section 9.1.5, subsection I.4.C specifically recognizes ASME NOG-1-2004 as an acceptable method of meeting NUREG-0554 requirements.

Table 7200-1 of ASME NOG-1-2004 specifies required inspections and tests for overhead cranes. The inspections include structural welds, and welds involving the load block, hoist, and girders. The type of weld inspection used for each of the critical welds was determined using the guidance provided in ASME NOG-1-2004, Table 7200-1.

Subsequent to the submittal of license amendment request 227 (reference 1), DEK completed a modification to upgrade the KPS auxiliary building (AB) crane to meet the requirements of a single-failure-proof crane. Post-modification testing of the crane included a functional test of the protective features and restricted zone limits, a 100%

and 125% load test of both the main and auxiliary hoists and NDE of the critical welds on the bridge structure.

A pre-load test NDE of the critical welds was performed. This examination found a lack of fusion and slag along the roots of all five bridge girder flange splice welds. Based on their extent and location, the flaws appear to have been introduced during original manufacturing and not service induced.

DEK reviewed several options to resolve the unacceptable indications of lack of fusion and determined that welding splice plates over the existing welds would ensure continued safe and reliable operation of the AB crane. The splice plates and their associated welds were designed to ensure the structural integrity of the crane without any credit for the original welds. Further, each splice plate was configured such that a flaw cannot propagate from the original weld to the splice plate welds. The splice plates are now credited for maintaining the integrity of the girder flange splice. Therefore, the splice plate welds were inspected during the post-load test NDE and will be included in the periodic NDE of the critical welds.

The Dominion Fleet procedures for NDE employ ultrasonic and magnetic particle techniques for the examination of structural steel welds. These procedures are based on the requirements of AWS D1.1- 2004. The weld inspections following the cold proof test will also be performed using the AWS D1.1-2004 methodology and acceptance criteria. The specified interval between NDE of these welds will meet the criteria of NUREG-0554, section 2.4. The inspections will occur on a four-year interval or less after completion of initial cold proof load testing.

Based on the above, DEK makes the following commitment to ensure that NDE of welds on the AB crane is periodically performed in accordance with NUREG-0554, section 2.4.

For the auxiliary building crane bridge welds whose failure could result in the drop of the critical load, DEK will perform nondestructive examinations (NDE) at least once every four years following completion of initial cold proof load testing of the auxiliary building crane.

References:

1. Letter from Gerald T. Bischof (DEK) to Document Control Desk, "License Amendment Request 227 – Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual," dated November 9, 2007 (ADAMS Accession No. ML073170705).
2. Letter from Patrick D. Milano (NRC) to D. A. Christian (DEK), "Kewaunee Power Station – Request for Additional Information Regarding Relocating Requirements for Spent Fuel Pool Crane System (TAC NO. MD7301)," dated February 22, 2008 (ADAMS Accession No. ML080520273).
3. Letter from CW Giesler (WPSC), to DG Eisenhut (NRC) "Control of Heavy Loads – Nine-Month Response," dated March 9, 1983.
4. ASME NOG-1-2004, "Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)," dated May 16, 2005.

ATTACHMENT 2

SUPPLEMENTAL INFORMATION FOR KEWAUNEE LICENSE AMENDMENT REQUEST 227

KEWAUNEE POWER STATION
DOMINION ENERGY KEWAUNEE, INC.

Supplemental Information for Kewaunee License Amendment Request 227

The purpose of this attachment is to update the NRC on recent developments concerning this license amendment request (LAR) including completion of a commitment, a requested approval date change, a new commitment to limit use of the auxiliary building (AB) crane, and associated changes to the original submittal.

Commitment Completion

LAR 227 (reference 1), Attachment 7 contains a list of regulatory commitments proposed by Dominion Energy Kewaunee (DEK). The first commitment stated that DEK would notify the NRC when modifications to make 125-ton capacity AB crane single-failure-proof are complete. This commitment has been completed. The modifications to the 125-ton capacity AB crane to make it single-failure-proof have been completed. The design rated load and designed maximum critical load for the AB crane main hoist remains at 125 tons. Therefore, there is no further need for this commitment.

Requested Approval Date Change

As described in the cover letter to this submittal, KPS LAR 227 is one of two LARs needing approval to allow the AB crane to be used for moving dry fuel storage casks into and out of the spent fuel pool. In addition to LAR 227, LAR 234 (reference 2) was submitted for NRC approval. LAR 234 requested approval of a change in methodology for the seismic analysis of the AB crane and was originally requested to be approved in conjunction with LAR 227. Both of these LARs were needed for the site to begin spent fuel cask loading operations.

As a result of unresolved issues with the proposed new methodology for the crane seismic analysis, LAR 234 was withdrawn (reference 3). A new LAR is under development and will be separately submitted for NRC approval. The new LAR will propose a seismic analysis methodology which is different from that currently licensed for use at KPS. In order to lift a load as heavy as a spent fuel cask, approval of a change in methodology for the AB crane seismic analysis is required in conjunction with this amendment. However, approval of the change in methodology for the AB crane seismic analysis is not required to use the single-failure-proof crane for lifting loads of up to 50 tons. A seismic analysis of the KPS single-failure-proof crane has been completed using currently licensed methods. This analysis concluded that the AB crane will withstand the effects of a design basis earthquake with a load of up to 50 tons suspended from the main hook.

Therefore, in order to facilitate use of the single-failure-proof crane for removing interferences in the spent fuel pool and to maintain our current schedule for spent fuel cask loading, DEK requests that the approval date for LAR 227 be changed from May

30, 2008 to October 31, 2008. DEK has included a commitment in this response that would prohibit the movement of loads greater than 50 tons (see below) with the new single-failure-proof crane until a change of seismic methodology is approved by the NRC and an analysis is completed which demonstrates the crane is capable of withstanding a DBE with a load of up to its design rated load suspended from the main hook.

With the change to the requested approval date, review of KPS LAR 227 can proceed, independent of the request for approval of a change in methodology for the seismic analysis of the AB crane. When the proposed new seismic analysis methodology for the AB crane is submitted under a separate LAR, the NRC review may proceed independent of LAR 227 as well. Approval of LAR 227 will allow DEK to perform work in the spent fuel pool needed to prepare for spent fuel cask loading and relocation of spent fuel to a new independent spent fuel storage installation (ISFSI).

Commitment to limit use of the Auxiliary Building Crane

LAR 227 was proposed to modify the wording of KPS TS 3.8.a.7 to facilitate load handling activities (including spent fuel casks) over and in the spent fuel pool. Since the submittal of LAR 227, the AB crane has been upgraded to a single-failure-proof design. DEK has also performed an analysis, using currently approved methods for crane seismic analysis, which demonstrates the single-failure-proof crane can withstand a design basis seismic event with loads of up to and including 50 tons suspended from the crane hook. Thus, the AB crane is currently considered to be a fully qualified single-failure-proof crane for handling loads of 50 tons or less.

However, until LAR 227 is approved, no loads can he handled in or over the spent fuel pool. DEK requests approval of LAR 227 to perform work in the spent fuel pool in order to maintain our current schedule for initial spent fuel cask loading operations. This work includes performing lifts of equipment located inside the spent fuel pool. All of the lifts are less than 50 tons.

As discussed above, NRC approval of both LAR 227 and a seismic analysis methodology change is needed to allow use of the AB crane for moving spent fuel casks into and out of the spent fuel pool. Currently a seismic analysis methodology which would demonstrate the AB crane can safely handle loads greater than 50 tons during a DBE has not been submitted to or approved by the NRC. Therefore, approval of LAR 227 alone will not permit DEK to move or lift a NUHOMS® transfer cask (which are greater than 50 tons) into the spent fuel pool.

Upon NRC approval of LAR 227, DEK intends to implement the amendment within 60 days. Upon implementation, DEK will comply with the modified and relocated requirements for control of heavy loads. In addition, to ensure that no load greater than 50 tons is lifted using the AB crane before approval of the new seismic methodology, the following commitment is provided. This commitment will become effective upon implementation of the TS change associated with LAR 227:

DEK will not perform a lift greater than 50 tons using the Auxiliary Building crane. This commitment will be superseded when a seismic analysis, using NRC approved methods, demonstrates acceptable results are achieved for the auxiliary building crane and establishes a new limit based on lifting heavy loads greater than 50 tons.

DEK believes this commitment is reasonable and assures safety and compliance based upon the following:

1. The AB single-failure-proof crane has been shown by evaluation, using currently licensed crane seismic analysis methods, to be able to withstand a design basis seismic event with a load of up to 50 tons suspended from the hook.
2. The changes proposed in LAR 227 are reasonable and conservative and will be followed for all lifts.
3. The AB crane's rated capacity is 125 tons. Therefore, the commitment only permits up to 40% of the known and demonstrated capacity of the AB crane to be utilized.
4. The AB crane has been tested at 125% of the rated capacity (156.25 tons) which demonstrates that there is further margin for lifts not exceeding 50 tons.
5. The single-failure-proof upgrade of the AB crane provides a defense-in-depth approach to assure safe handling of heavy loads. The NRC has accepted the approach in NUREG-0612.
6. DEK will continue to use the electrical interlocks described in attachment 1 of this submittal to ensure that safe load paths are used when handling heavy loads with the AB crane.

Associated Changes to Original Submittal

DEK performed a review of the original submittal of Kewaunee LAR 227 (reference 1). Based on this review, one correction and two changes were identified. They are:

1. Attachment 1, page 12 of 28 states that the special lifting device meets the guidance of NUREG-0612, Section 5.1.5(1)(a). It should state it meets the guidance of NUREG-0612, Section 5.1.6(1)(a).
2. Removal of the Cask Drop Analysis.
3. Change in actual maximum critical load and design rated load capacity.

Each of these corrections/changes are expanded on below.

The identified correction is on page 12 of 28 of attachment 1. Attachment 1, Section 4.4, "NUREG-0612, Section 5.1.6, Single-Failure-Proof Handling Systems," explains

how Kewaunee will meet the guidance listed in NUREG-0612, Section 5.1.6. Attachment 1, subsection 4.4.1.1 explains how Kewaunee will meet the guidance in NUREG-0612, Section 5.1.6, item (1)(a). The listed section, Section 5.1.5(1)(a), provides guidance for lifting heavy loads over other plant areas and states that an acceptable method is to meet Section 5.1.6, single-failure-proof guidelines. As Attachment 1, subsection 4.4.1.1 addresses special lifting devices and NUREG-0612, Section 5.1.6, item (1)(a) deals with special lifting devices the quoted section that Kewaunee meets in attachment 1, subsection 4.4.1.1, is NUREG-0612, Section 5.1.6(1)(a).

DEK intends to remove the cask drop analysis from the Kewaunee USAR. The Kewaunee AB crane has been modified to be single-failure-proof to a maximum designed MCL and DRL of 125 tons on the main hook and 15 tons on the auxiliary hook. Because of limitations in the currently licensed methods for the seismic analysis of the crane, DEK has placed a limitation of 50 tons on the loads that can be handled by the AB crane. Therefore, based on the currently approved analysis, either a cask will be handled by a single-failure-proof AB crane or it will not be handled at all by the AB crane. Thus, the cask drop event continues to be considered not credible, and the cask drop analysis may be removed from the USAR.

Because of limitations in the currently licensed methods for seismic analysis of the AB crane and support structure, DEK has placed a limitation of 50 tons on the loads that can be handled by the AB crane. DEK LAR 227 (reference 1), attachment 6 describes the Kewaunee AB crane's compliance with the guidance listed in NUREG-0554. Several NUREG-0554 items provide guidance for the design and testing of crane Maximum Critical Load (MCL) and design rated load (DRL), while others provide guidance associated with the actual MCL and DRL. For the Kewaunee AB crane the hoists, trolley, and bridge have been design to allow for a MCL and DRL of 125 tons on the main hook and 15 tons on the auxiliary hook. Based on limitation of the currently licensed seismic analysis, the main hook has been de-rated to a MCL and DRL of 50 tons. Table 3 lists the associated sections of NUREG-0554 that provide guidance associated with the MCL and DRL and changes necessary to accommodate de-rating of the main hook.

Table 3

Kewaunee Auxiliary Building Crane

NUREG-0554 Compliance Matrix Changes Concerning MCL and DRL

NUREG-0554 SEC #	NUREG Requirement	Kewaunee Compliance	Kewaunee Compliance Change* Due to De-rate
2.2 Maximum Critical Load	Single-failure-proof crane should be designed to handle the maximum critical load (MCL)	The main hoist, trolley and bridge were designed for the specified maximum critical load (MCL) of 125 tons. The auxiliary hoist was designed for the specified MCL of 15 tons.	The AB Crane main hoist has been de-rated to a MCL of 50 tons due to a change in seismic analysis methodology requiring prior NRC approval. The MCL and DRL markings on the crane will be changed to reflect a de-rate of the main hoist from 125 tons to 50 tons.
	The MCL rating should be clearly marked on the crane.	The MCL (Maximum Critical Load) and DRL (Design Rated Load) markings were clearly marked on the replacement trolley, crane bridge and on both sides of the hoist lower blocks.	
	The DRL rating marked on the crane separately from the MCL marking.	The MCL and DRL markings were clearly marked on the replacement trolley, crane bridge and on both sides of the main & auxiliary hoist lower blocks.	
2.5 Seismic Design	Crane designed to retain control of and hold the load.	The crane was designed to retain control of the 125 ton MCL (Main Hoist) and 15 ton MCL (Aux Hoist) for all load combinations including broken rope, two-blocking, load hang-up and OBE & SSE seismic events.	The crane design for broken rope, load hang-up, and two blocking has been shown to be acceptable at a MCL of 125 tons for the main hoist and 15 tons for the Auxiliary hoist. The seismic evaluation methodology used at a MCL of 125 tons needs prior NRC approval. The main hoist has been de-rated to a MCL of 50 tons based on a seismic analysis performed using existing licensing basis methods.
	The MCL plus operational and seismically induced pendulum and swinging load effects ... considered in the trolley design and they should be added to the trolley weight for the bridge design.	The crane mathematical model appropriately considered seismically induced pendulum and swinging load effects. The pendulum effect due to horizontal seismic input and swinging load effects was evaluated and determined to be insignificant.	

Table 3

Kewaunee Auxiliary Building Crane

NUREG-0554 Compliance Matrix Changes Concerning MCL and DRL

NUREG-0554 SEC #	NUREG Requirement	Kewaunee Compliance	Kewaunee Compliance Change* Due to De-rate
8.5 Maintenance	The MCL rating of the crane should be established as the rated load capacity, and the design rating for the degradable portion of the handling system should be identified to obtain the margin available.	The MCL and DRL ratings of the crane were 125 tons. An approximate 15% additional design factor was included for the mechanical components subject to wear, including wire rope, hooks, sheave and drum bearings, and brakes. If degradation of the handling system is discovered, it will be handled in accordance with KPS condition reporting system (CRS) procedures.	De-rating the main hoist MCL to 50 tons does not affect the wear analysis done at 125 tons. However, because of the seismic methodology issue, the MCL marking on the crane will be changed to 50 tons.
	The MCL should be plainly marked on each side of the crane for each hoisting unit.	The MCL rating was marked on the bridge and each side of each lower blocks.	

* Compliance change is from that listed in DEK's Kewaunee LAR 227 (reference 1)

References

1 Letter from Gerald T. Bischof (DEK) to Document Control Desk, "License Amendment Request 227 – Relocation of Spent Fuel Pool Crane Technical Specification to Technical Requirements Manual," dated November 9, 2007 (ADAMS Accession No. ML073170705).

2 Letter from Gerald T. Bischof (DEK) to Document Control Desk, "License Amendment Request 234 – Request for Review and Approval of Methodology Change Regarding Auxiliary Building Crane Upgrade," dated November 9, 2007 (ADAMS Accession No. ML073180499).

3 Letter from Gerald T. Bischof (DEK) to Document Control Desk, "Withdrawal of License Amendment Request 234 – Request for Review and Approval of Methodology Change Regarding Auxiliary Building Crane Upgrade," dated April 11, 2008 (ADAMS Accession No. ML081050011).