

April 14, 2010

Mr. David A. Heacock
President and Chief Nuclear Officer
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Innsbrook Technical Center – 2SW
5000 Dominion Blvd.
Glen Allen, VA 23060-6711

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
KEWAUNEE POWER STATION LICENSE RENEWAL APPLICATION
(TAC NO. MD9408)

Dear Mr. Heacock:

By letter dated August 12, 2008, Dominion Energy Kewaunee, Inc. submitted an application for renewal of operating license DPR-43 for the Kewaunee Power Station. The staff of the U.S. Nuclear Regulatory Commission (NRC or the staff) is reviewing this application in accordance with the guidance in NUREG-1800, "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants." During its review, the staff has identified areas where additional information is needed to complete the review. The staff's requests for additional information are included in the enclosure. Further requests for additional information may be issued in the future.

Items in the enclosure were discussed with Paul Aitken, of your staff, and a mutually agreeable date for the response is within 30 days from the date of this letter. If you have any questions, please contact me by telephone at 301-415-3873 or by e-mail at John.Daily@nrc.gov.

Sincerely,

/RA/

John Daily, Sr. Project Manager
Project Operations Branch
Division of License Renewal
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosure:
As stated

cc w/encl: See next page

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ADAMS Accession Number: **ML100950379**

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Letter to David A. Heacock from John Daily dated April 14, 2010

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**KEWAUNEE POWER STATION
LICENSE RENEWAL APPLICATION
REQUEST FOR ADDITIONAL INFORMATION**

RAI B2.1.32-5, Review of Work Control Process, Kewaunee License Renewal Application

Background: In the Dominion Energy Kewaunee (Dominion) Letter No. 09-597 dated September 25, 2009 (Agencywide Documents Access and Management System (ADAMS) Accession Number ML092710045), Dominion amended the Work Control Process (WCP) aging management program (AMP) and identified that the WCP is a new AMP that when enhanced will be consistent with the program elements recommended in: (a) Generic Aging Lessons Learned (GALL) AMP XI.M32, "One-Time Inspection," when implemented as a one-time inspection program for those components that are managed on a preventative or mitigative monitoring basis (i.e., through implementation of either license renewal application (LRA) AMP B2.1.24, "Primary Water Chemistry Program;" AMP B2.128, "Secondary Water Chemistry Program;" AMP B2.1.8, "Closed-Cycle Cooling Water Program;" AMP B2.1.14, "Fuel Oil Program;" or AMP B2.1.17, "Lubricating Oil Analysis Program"), and (b) GALL AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," when applied as a periodic condition monitoring program and subject to the exceptions that were taken to GALL AMP XI.M38 in the letter of September 25, 2009. On December 3, the staff issued requests for additional information (RAIs) B2.1.32-1, -2, -3, and -4 with respect to the revised program element criteria for the WCP and on some of exceptions that were taken to GALL AMP XI.M38. Dominion responded to these RAIs in the Dominion Letter No. 09-777, dated January 21, 2009 (ADAMS Accession No. ML100220066). The staff has reviewed the information in the letters of September 25, 2009 and January 21, 2010, and has the following issues that require resolution.

Issue 1 (Part 1 of the RAI - In regard to the information that has been submitted for the WCP in the letter of September 25, 2009, as supplemented by the response to RAI B2.1.32-1 in the letter of January 1, 2010): The staff has noted that the applicant is crediting methodology in EPRI TR 107514 as the basis for selecting the sample sizes for the material-environment-aging effect combinations that will be managed by the WCP on a one-time inspection basis, and that this report states that the sample sizes should achieve a desired confidence level. However, the applicant's basis continues to leave some uncertainty with respect to establishing the sample size for the material-environment-aging effect-based populations being managed on a one time inspection basis s because the applicant did not exactly specify or provide a justification for the minimum sample sizes that would be needed for these one-time inspections of these populations, or establish a limit, with justification, on when these one-time examinations would need to be completed to ensure appropriate and timely verification of preventative or mitigative program effectiveness. In addition, the staff's position on use of GALL AMP XI.M32 has been that one-time inspections of components that are managed on a one-time condition monitoring basis will need to be completed by a specified time agreed upon time (usually prior to entering the period of extended operation or within several years of entering the period of extended operation).

ENCLOSURE

Request 1: Regarding the information that was submitted on use of EPRI Report No. TR-107514, specify and justify the minimum percentage of components that will be used to establish the sample sizes for the one-time examinations of the stated component populations. In addition, identify and justify when the one-time inspections for the WCP will be completed.

Issue 2 (Part 2 of the RAI - In regard to the information that has been submitted for the WCP in the letter of September 25, 2009, as supplemented by the response to RAI B2.1.32-3 in the letter of January 1, 2010): The staff has noted that under the applicant's amended WCP basis, as given in the applicant's letter of September 25, 2009, and supplemented with information in the letter of January 21, 2010, the WCP lends itself to being a program that monitors for abnormal surface conditions such as rust, discoloration, deposits, scale or abnormal surface conditions, or for evidence of cracking or changes in the material properties for elastomeric components.¹ In RAI B2.1.32-3, the staff inquired as to the type of visual examination methods that would be used to detect indications/parameters associated with these aging effects (i.e., specify VT-1, VT-3, etc.). In the response to RAI B2.1.32-3, the applicant stated that the 'non-defined' visual examination methods would be capable of detecting these aging effects and that personnel performing either the preventative maintenance activities or periodic surveillance activities would be trained to perform the inspection and would be generally qualified to detect the aging effects. The RAI response did not define the type of visual examination methods (in terms of ASME Code defined visual examination methods) that would be used to detect the parameters associated with these aging effects. The staff noted that the amended WCP basis only refers to EPRI Report No. TR-107514 as the basis for establishing the sample sizes of components that will be inspected under the program. The amended basis does not establish, define, or justify the minimum sample size that will need to be applied to the material-environment-aging effect populations being managed by the AMP on a periodic basis, or the minimum inspection frequency.

Request 2:

A. Specify and justify the minimum percentage of components that will be used to establish the sample sizes for the for the component populations that are associated with these material-aging effect combinations and that will be managed on a periodic WCP-inspection basis.

B. For these component populations, specify and justify the maximum frequency for the examinations.

¹ With the exception of the visual techniques that the applicant is crediting for detection of cracking in metallic components, which the applicant's letter of September 25, 2009 identifies will be EVT-1 techniques or their equivalent.

Issue 3 (Part 3 of the RAI - In regard to the operating experience information that has been submitted for the WCP in the letter of September 25, 2009): The staff has noted that, in regard to the operating experience (OE) examples that were provided for the WCP in the letter of September 25, 2009, the OE discussions create some uncertainties on whether the implementation of the WCP will be capable of detecting the aging effects for which it is credited prior to a loss of component intended function.² In a conference call dated March 18, 2010, the applicant informed the staff that the WCP is a new program that, when implemented, will be consistent with the criteria in GALL AMP XI.M32, "One-Time Inspection," when performed on a one-time condition monitoring basis, and with the criteria in GALL AMP XI.M38, "Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components," with exceptions, when performed on a periodic condition monitoring basis. During the conference call, the applicant clarified that since the AMP is a new program, the OE discussions provided in the letter of September 25, 2009, were only provided as examples to indicate that the program had in the past detected relevant aging effects and that the examples were not used for the purpose of demonstrating the capability of AMP to detect aging. For new programs, Section A.1.2.3.10 in "Standard Review Plan for Review of License Renewal Applications for Nuclear Power Plants" (SRP-LR) Branch Position RLSB-1 (Appendix A.1 of NUREG-1800, Revision 1) states that:

"An applicant may have to commit to providing operating experience in the future for new programs to confirm their effectiveness."

The staff is concerned with Dominion's basis that the WCP is a new program and that OE discussions in the letter of September 25, 2009 are only to be used as examples of relevant past OE. The staff generally assesses the OE examples and discussions and uses the OE discussions as a basis for assessing whether the discussed OE could create uncertainties on whether the WCP is capable of managing the aging effects for which it is credited.

Request 3: Provide your basis why the staff should not use the OE examples provided in the Dominion Serial Letter No. 09-597 to assess whether the WCP will be capable of managing the aging effects for which it is credited. In addition, since this AMP is being defined as a new AMP for the LRA, clarify whether Dominion will amend the LRA to provide the type of commitment recommended in Section A.1.2.3.10 in SRP-LR Branch Position RLSB-1 for future OE that is detected by the WCP, as relevant to Updated Safety Analysis Report (USAR) Supplement Section A2.1.32 for the WCP.

² Refer to Attachment 1 to this RAI letter for a summary of the staff's issues with the OE discussion that were provided in Dominion Serial Letter No. 09-597, dated September 25, 2009 (ADAMS ML092710045).

Issue 4 (Part 4 of the RAI - In regard to the enhancement of the WCP, USAR Supplement Section A2.1.32, and Commitment No. 25, as defined in the letter of September 25, 2009):
SRP-LR Section 3.0 defines AMP enhancements as follows:

“In some cases, an applicant may choose an existing plant program that does not currently meet all the program elements defined in the GALL Report AMP. If this is the situation, the applicant may make a commitment to augment the existing program to satisfy the GALL Report AMP element prior to the period of extended operation. This commitment is an AMP enhancement.

Enhancements are revisions or additions to existing aging management programs that the applicant commits to implement prior to the period of extended operation. Enhancements include, but are not limited to, those activities needed to ensure consistency with the GALL Report recommendations. Enhancements may expand, but not reduce, the scope of an AMP.”

The SRP-LR guidance does not state that enhancements are applicable to new AMPs.

In the enhancement of the WCP (as given in Dominion Serial Letter No. 09-597; ADAMS ML092710045), the applicant only indicates that the program is a new program that “will be consistent with the recommendations in NUREG-1801, Section XI.M32, ‘One Time Inspection,’ and NUREG-1801, Section XI.M38, ‘Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components,’” and that this commitment is reflected in Commitment 25, which was placed on USAR Supplement Table A6.0-1. In contrast, the staff noted that, in LRA Commitment No. 25, the applicant only indicated that the WCP, as a new AMP, will be implemented during the period of extended operation.³ Thus, it is not clear whether commitment No. 25 is being placed on the USAR supplement for the LRA to reflect a simple need for implementing the WCP during the period of extended operation without any need for enhancing the program, or whether the commitment is being placed on the USAR supplement to reflect that particular program element criteria for the WCP would need to be enhanced to make them consistent with either GALL AMP XI.M32 (when applied on a one-time condition monitoring basis) or GALL AMP XI.M38 (when applied on a periodic condition monitoring basis), or with the stated definition for AMP enhancements in Section 3.0 of the SRP-LR.

In addition, the staff has also observed that there are inconsistencies between the information provided in the letter of September 25, 2009 on AMP B2.1.32, the enhancement of the WCP, USAR Supplement Section A2.1.32, and Commitment No. 25. In particular, the updated enhancement and USAR supplement summary description for the WCP, reflect that the AMP would be implemented consistent with the recommended program element criteria in GALL AMP XI.M32 when applied on a one-time inspection basis, and with those in GALL AMP XI.M38, “Inspection of Internal Surfaces in Miscellaneous Piping and Ducting Components,”

³ Specifically, Commitment No. 25 reads as follows: “**Commitment:** The Work Control Process will be established. The program will perform one-time inspections as a verification of the effectiveness of chemistry control programs. The program will also perform visual inspections of component internal surfaces, and external surfaces of selected components, to manage the effects of aging when the surfaces are made available for examination through surveillance and maintenance activities. **Source:** Work Control Process. **Schedule:** Prior to the Period of Extended Operation.”

when applied as a periodic condition monitoring program. However, the revised AMP B2.13.2 basis for the WCP, as proposed in the letter of September 25, 2009, indicates that the AMP would be implemented consistently with the guidance in GALL AMP XI.M38 when applied as a periodic condition monitoring program, but also when subjected to four specifically defined exceptions that the applicant has taken to the program elements in GALL AMP XI.M38. These apparent inconsistencies need to be resolved.

Request 4: Review the information that has been supplied for the WCP (LRA AMP B2.1.32), the enhancement for the WCP, USAR Supplement Section A.2.1.32, and Commitment No. 25 in the September 25, 2009 letter (as supplemented by the letter of January 21, 2009), for consistency against each other. Clarify whether Commitment No. 25 on USAR Supplement Table A6.0-1 is either: (1) simply being placed on the LRA for the purpose of indicating that the WCP, as a new AMP, will be implemented during the period of extended operation, without any need for enhancing (i.e., revising or adding to) defined program elements of the AMP prior to implementation of the program, or (2) whether Commitment No. 25 is being placed on the LRA to reflect that particular program elements for the WCP will need to be enhanced to make the particular program element criteria for the WCP either (1) consistent with GALL or (2) consistent with GALL as subjected to particular exceptions, prior to implementation of the program. If it is the former case, amend the LRA to remove the enhancement of the program leaving the current version of Commitment No. 25 in place. If it is the latter case, clarify why such enhancements of the WCP should be permitted when Section 3.0 of the SRP-LR does not apply enhancements to new programs, and provide the following additional clarifications and amendments of the LRA: (1) for implementation of the program on a one-time inspection basis, clarify which program elements in GALL AMP XI.M32, or procedures associated with these program elements, will need to be enhanced to make the program elements of the AMP consistent with GALL AMP XI.M32, (2) for implementation of the program on a periodic inspection basis, clarify which program elements in GALL AMP XI.M38, or procedures associated with these program elements, will need to be enhanced to make the program elements of the AMP consistent with GALL AMP XI.M38 (as subject to and with the exception of the four specific exceptions that had been identified and taken on GALL AMP XI.M38 in the letter of September 25, 2009), and (3) amend the existing enhancement of AMP and LRA Commitment No. 25 to reflect this information.

Attachment 1 – Issues with Operating Experience Discussions that Were Provided in the Dominion Serial Letter No. 09-597, Dated September 25, 2009

Operating Experience Example 1: In regard operating experience (OE) discussion that has been cited for the occluded fire protection piping (located adjacent to the fire protection jockey pump discharge valve), the OE discussion has created a consistency issue in the license renewal application (LRA) on whether loss of fire water flow (loss of raw water flow) induced by fouling (rust) should have been identified as an aging effect requiring management for the internal surfaces of fire protection system piping that is exposed to fire protection water (raw water), or if not, whether this event should have been cited as relevant OE for the Work Control Process (WCP). In particular, LRA Section 3.3.2.1.18, “Fire Protection System,” and LRA Table 3.3.2-18, “Auxiliary Systems – Fire Protection – Aging Management Evaluation” does not identify loss of fire water flow as an aging effect requiring management (AERM) during the period of extended operation for fire protection system piping, piping components, or piping elements. If loss of fire water flow due to fouling is not an AERM for the fire protection system piping exposed to fire water (which is identified as raw water in the in LRA Table 3.3.2-18), this event should not have been identified as relevant OE for the WCP. In contrast, if loss of fire water flow induced by fouling is an AERM for fire protection system components that are exposed internally to fire water, the applicant should have included an applicable evaluation discussion for this aging effect in LRA Section 3.3.2.1.18 and an applicable aging management review (AMR) line item for the aging effect in LRA Table 3.3.2-18, with identification of the aging management program (AMP) that will be used to manage the aging effect during the period of extended operation. The letter of September 25, 2009 did not amend the WCP to credit the WCP for management of this aging effect in the fire protection system components. The staff also has observed that the implementation of the WCP did not detect the rust in the piping until it had occluded 90% of the cross section area available for fire water flow through the system, and that the applicant’s OE discussion did not identify whether the piping would have met the system flow requirements and would have been capable of performing its intended fire protection function with only 10% of the inside pipe cross section area available for normal operating flow. Thus, if loss of fire water flow is an AERM for this piping, and if the WCP will be the AMP that is credited to manage this aging effect, the OE discussion does not provide any assurance that application of the WCP will be capable of detecting fouling-induced blockage in the fire protection piping, piping components, or piping elements before the extent of blockage would cause the system to fail to meet its system flow requirements (when required to be called upon for actuation). If (otherwise) component structural integrity is the only intended function of concern for this component, and loss of material/rusting is the only aging effect/mechanism of concern, the OE discussion fails to provide a basis on why the WCP was considered to be capable of detecting loss of material due to corrosion (rusting) in a timely fashion prior to a loss of intended function.

Operating Experience Example 2: In regard to the OE discussion that has been cited for the service water valve disc seat, the OE example indicates that the valve was observed to weep (leak) in 2006 and that a work order was issued in 2006 on this event calling for an inspection of the valve seating. The OE discussion also indicates that the inspections on the valve seat were performed in 2008, and that when implemented, the inspections of the valve seat had indicated the presence of erosion in the valve seat, prompting a replacement of the valve. The staff has concerns that performance of the inspection of the valve seat and correction of the weeping condition found in the component was not completed until two years after issuing the work

order. This creates some uncertainty on whether appropriate monitoring and trending activities for the WCP will be initiated on a timely fashion for noted conditions, and whether prompt corrective actions would be applied under implementation of the WCP due to delays in performing appropriate monitoring and trending activities.

Operating Experience Example 3: In regard to the OE discussion that has been cited on the loss of material occurring in the 'B' component cooling water pump casing, the OE discussion establishes that loss of material was detected in the 'B' component cooling water pump casing in April 2008. The OE discussion does not specify which age-related degradation mechanism induced the loss of material in the 'B' train component cooling water pump casing. The OE discussion also appears to indicate that the applicant only performed a review of past operating history as its sole basis for confirming that the OE was not applicable to the 'A' component cooling water pump casing; however, the OE discussion does not specify whether the applicant opened up the corresponding 'A' train pump casing in order to verify that this type of condition was not occurring in the 'A' train pump casing, or whether the 'B' train component cooling water pump casing was considered to be operable with noted degradation left in the uncorrected condition. Thus, the OE discussion does not currently support the conclusion that implementation of the WCP would be capable of initiating those appropriate "monitoring and trending" activities or "corrective action" activities for detected component conditions, including the need to assess whether applicable sample expansion criteria should be applied when adverse material conditions are detected in the components.