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United States Nuclear Regulatory Commission  
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Washington, DC 20555-0001

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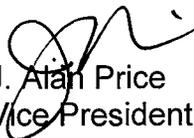
**DOMINION ENERGY KEWAUNEE, INC.**  
**KEWAUNEE POWER STATION**  
**SUPPLEMENTAL INFORMATION FOR THE REVIEW OF THE KEWAUNEE POWER**  
**STATION LICENSE RENEWAL APPLICATION**

During a telephone conference held on Thursday, September 30, 2010 (reference 1), members of the NRC and Dominion Energy Kewaunee, Inc. (DEK) staffs discussed the metal fatigue evaluations performed to support the Kewaunee Power Station (KPS) license renewal application (LRA) (reference 2). As a result of the conference call, DEK is supplementing its response to RAI B3.2-2a, which was submitted to the NRC in Reference 3. Attachment 1 to this letter provides the supplemental response to RAI B3.2-2a.

During a telephone conference held on Wednesday, October 13, 2010 (reference 4), members of the NRC and DEK staffs discussed management of potential cracking of the steam generator tube-to-tubesheet welds, and a clarification of License Renewal Commitment 50 which was provided in DEKs response to RAI B2.1.32-5a in Reference 3. As a result of the conference call, Attachment 2 to this letter provides information related to management of potential steam generator tube-to-tubesheet weld cracking and supplements the previous response to RAI B2.1.32-5a.

Should you have any questions regarding this submittal, please contact Mr. Paul C. Aitken at (804) 273-2818.

Very truly yours,

  
J. Alan Price  
Vice President – Nuclear Engineering



Commitments made in this letter:

1. License Renewal Commitments 51 and 52 will be added to LRA Table A6.0-1 consistent with the supplemental response to RAI B3.2-2a. The new commitments are proposed to support approval of the renewed operating license, and may change during the NRC review period.
2. License Renewal Commitment 53 will be added to LRA Table A6.0-1 consistent with the response to the NRC staff question related to management of steam generator tube-to-tubesheet weld cracking. The new commitment is proposed to support approval of the renewed operating license, and may change during the NRC review period.
3. License Renewal Commitment 50 will be revised consistent with the supplemental response to RAI B2.1.32-5a. The revised commitment is proposed to support approval of the renewed operating license, and may change during the NRC review period.

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**ATTACHMENT 1**

**SUPPLEMENTAL RESPONSE TO RAI B3.2-2a**

**KEWAUNEE POWER STATION  
DOMINION ENERGY KEWAUNEE, INC.**

### **Supplemental Response to RAI B3.2-2a**

In response to NRC RAI B3.2-2, DEK performed ASME Code, Section III, NB-3200 fatigue evaluations for the surge line hot-leg nozzle and the charging line nozzle. The evaluations confirmed acceptable fatigue usage for these nozzles. The evaluations were consistent with the NRC staff recommendations provided in NRC Regulatory Issue Summary (RIS) 2008-030, *Fatigue Analysis of Nuclear Power Plant Components*. A summary of the results of the fatigue evaluations was provided to NRC in DEK letter 10-324, dated June 1, 2010 [ADAMS ML101610233]. In the response to a follow-up RAI (NRC RAI B3.2-2a), provided in DEK letter 10-548, dated September 23, 2010 [ADAMS ML102700162], DEK stated that EPRI FatiguePro software would be used as part of the *Metal Fatigue of Reactor Coolant Pressure Boundary* program, but that the stress-based fatigue monitoring module would not be used to monitor fatigue usage for the surge line hot-leg nozzle or the charging line nozzle.

During a subsequent conference call on September 30, 2010, the NRC staff requested that ASME Code, NB-3200 fatigue evaluations also be performed for the pressurizer lower head and surge line to confirm the results documented in LRA Section 4.3.1.4, which are based on EPRI FatiguePro stress-based fatigue monitoring. In addition, the NRC staff questioned whether additional components (i.e., beyond those components evaluated in NUREG/CR-6260, "Application of NUREG/CR-5999 Interim Fatigue Curves to Selected Nuclear Power Plant Components") need to be evaluated for the effects of the reactor coolant environment on the cumulative fatigue usage to confirm that the NUREG/CR-6260 evaluated components are limiting for the Kewaunee plant configuration.

In response to the NRC staff request and question above, DEK will perform an evaluation of the cumulative fatigue usage for the pressurizer lower head (which includes the pressurizer heater penetrations and pressurizer surge line nozzle) and surge line, consistent with the requirements of ASME Code, Section III, NB-3200. The EPRI FatiguePro stress-based fatigue monitoring described in LRA Section 4.3.1.4 will not be used to monitor fatigue usage for the pressurizer lower head and surge line.

DEK will also perform a review of design basis ASME Class 1 component fatigue evaluations to determine whether the NUREG/CR-6260 components that have been evaluated for the effects of the reactor coolant environment on the fatigue usage are the limiting components for the Kewaunee plant configuration.

These additional evaluations will be performed through the *Metal Fatigue of Reactor Coolant Pressure Boundary* program to manage metal fatigue associated with pressurizer lower head and surge line fatigue and the environmental effects on fatigue usage in accordance with 10 CFR 54.21(c)(1)(iii).

The following commitments will be added to LRA Appendix A, USAR Supplement, Table A6.0-1:

Item	Commitment	Source	Schedule
51	DEK will perform a fatigue evaluation of the pressurizer lower head and surge line that is consistent with the requirements of ASME B&PV Code, Section III, NB-3200 and will determine the cumulative fatigue usage through the period of extended operation.	Letter 10-595 Supplemental Response to RAI B3.2-2a	Prior to the Period of Extended Operation
52	DEK will perform a review of design basis ASME Class 1 component fatigue evaluations to determine whether the NUREG/CR-6260-based components that have been evaluated for the effects of the reactor coolant environment on fatigue usage are the limiting components for the Kewaunee plant configuration. If more limiting components are identified, the most limiting component will be evaluated for the effects of the reactor coolant environment on fatigue usage.	Letter 10-595 Supplemental Response to RAI B3.2-2a	Prior to the Period of Extended Operation

**ATTACHMENT 2**

**RESPONSE TO QUESTION RELATED TO MANAGEMENT OF STEAM  
GENERATOR TUBE-TO-TUBESHEET WELD CRACKING**

**AND**

**SUPPLEMENTAL RESPONSE TO RAI B2.1.32-5a**

**KEWAUNEE POWER STATION  
DOMINION ENERGY KEWAUNEE, INC.**

## **Management of Steam Generator Tube-to-Tubesheet Weld Cracking**

During a conference call on October 13, 2010, the NRC staff questioned how potential cracking in the Kewaunee steam generator tube-to-tubesheet welds will be managed if the material is susceptible to primary water stress corrosion cracking (PWSCC). The NRC staff concern is that PWSCC in the welds could lead to crack propagation through the welds causing a primary-to-secondary pressure boundary failure.

In response to the NRC staff concern, DEK will develop a plan to address potential failure of the steam generator primary-to-secondary pressure boundary due to PWSCC cracking of tube-to-tubesheet welds. The plan will consist of two resolution options:

1. Perform an analytical evaluation of the steam generator tube-to-tubesheet welds in order to:
  - a. Establish a technical basis which concludes that the structural integrity of the steam generator tube-to-tubesheet interface is adequately maintained with the presence of tube-to-tubesheet weld cracking, and
  - b. Establish a technical basis which concludes that the steam generator tube-to-tubesheet welds are not required to perform a reactor coolant pressure boundary function.

-or-

2. Perform a one-time inspection of a representative number of tube-to-tubesheet welds in each steam generator to determine if PWSCC cracking is present. If weld cracking is identified:
  - a. The condition will be resolved through repair or engineering evaluation to justify continued service, as appropriate, and
  - b. An ongoing monitoring program will be established to perform routine tube-to-tubesheet weld inspections for the remaining life of the steam generators.

The plan will be developed prior to the period of extended operation. As discussed in the response to RAI 3.1.2.2.13-1a in DEK letter 10-548, dated September 23, 2010 [ADAMS ML102700162], the lower portions of the Kewaunee steam generators, including the tubes and tubesheets, were replaced in 2001. The tube-to-tubesheet welds have accumulated less than 10 years service time. In consideration of the limited time the steam generators have been in service, the implementation of the plan,



### **Supplemental Response to RAI B2.1.32-5a**

During a conference call on October 13, 2010, the NRC staff indicated that License Renewal Commitment 50, provided in DEK letter 10-548, dated September 23, 2010 [ML102700162], did not specifically address the selection of surveillance and maintenance activities intended to identify "lead components" for the determination of aging effects within each of the material/environment combinations which credited the Internal Surfaces Monitoring portion of the Work Control Process program. In response, DEK is supplementing its response to NRC RAI B2.1.32-5a with the following, which supersedes the response provided in DEK letter 10-548 in its entirety:

#### **DEK Response**

As described in the response to RAI B2.1.32-2 in DEK letter 09-777 dated January 21, 2010 [ML100220066], a review of the scheduled surveillance and maintenance activities will be performed to select activities that will provide a set of inspections that will be representative of the components in the program. The review will consider component materials; operating environments; industry and plant-specific operating experience; engineering evaluations of equipment performance; and susceptibility to aging due to time in service, severity of operating conditions, and lowest design margins to determine the components that are the leading indicators of aging (lead components) in each of the material/environment combinations which credit the Internal Surfaces Monitoring portion of the Work Control Process program.

An audit will be performed of the scheduled surveillance and maintenance activities associated with the lead components prior to the period of extended operation. The audit will confirm that the components representing the leading indicators of aging for each of the material/environment combinations have been inspected in accordance with the Internal Surfaces Monitoring portion of the Work Control Process program. If any scheduled surveillance and maintenance activities associated with the lead components have not been performed, then deliberate focused inspections of these components will be performed within 5 years of the completion of the audit.

Additionally, to confirm that the Internal Surfaces Monitoring portion of the Work Control Process program continues to adequately manage aging of the components for which it is credited, this audit will be repeated during each 10 years of the period of extended operation. As with the initial audit, any identified deliberate focused inspections will be performed within 5 years of the completion of the audit.

The following commitment will be added to LRA Appendix A, Table A6.0-1:

Item	Commitment	Source	Schedule
50	<p>Perform an audit of the Internal Surfaces Monitoring portion of the Work Control Process program inspections to confirm that the components representing the leading indicators of aging for each of the material/environment combinations have been inspected at least once during the audit period.</p> <p>If any scheduled surveillance and maintenance activities which were intended to encompass components as leading indicators of aging in each of the material/environment combinations have not been performed, then deliberate focused inspections of these components will be performed.</p>	Letter 10-595 (Supplemental Response to RAI B2.1.32-5a)	<p>Prior to the Period of Extended Operation and every 10 years thereafter.</p> <p>Deliberate focused inspections will be performed within 5 years of the completion of the audits.</p>