NRR-PMDAPEm Resource

From: Feintuch, Karl
Sent: Friday, April 13, 2012 12:57 AM
To: 'Jack Gadzala'; 'Craig D Sly'
Cc: Brown, Leta; Torres, Roberto
Subject: ME7110 Kewaunee - Request for Additional Information (RAI) AADB and SCVB 2012-04-12
Attachments: ME7110 RAII-AADB, SCVB 2012-04-12 .docx

(DRAFT) REQUEST FOR ADDITIONAL INFORMATION
KEWAUNEE POWER STATION
LICENSE AMENDMENT REQUEST (TAC No. ME7110):
MODIFYING THE TECHNICAL SPECIFICATIONS (TS) AND
THE CURRENT LICENSING BASIS (CLB)
TO INCORPORATE CHANGES TO
THE CURRENT RADIOLOGICAL ACCIDENT ANALYSIS (RAA) OF RECORD
(KNOWN AS CHI-OVER-Q)
DOCKET NO. 50-305

By letter dated August 30, 2011, Dominion Energy Kewaunee (DEK) submitted a license amendment request (LAR)-244 (ADAMS Accession No. ML11252A521) to revise the Kewaunee Power Station (KPS) Operating License by modifying the Technical Specifications (TS) and the current licensing basis (CLB) to incorporate changes to the current radiological accident analysis (RAA) of record. This proposed amendment would revise the current RAA for the design-basis accidents (DBAs) described in Chapter 14 of the KPS Updated Safety Analysis Report (USAR). This amendment would also fulfill a commitment made to the NRC in response to Generic Letter 2003-01, “Control Room Habitability.”

In the course of their technical review, the Accident Dose Technical Branch (AADB and the Containment and Ventilation Technical Branch (SCVB) have requested further information items to enable completion of their respective Safety Evaluation efforts. These items are provided in draft form for you to review for clarification. We seek to confirm your understanding of the items and the determination of a firm date for response, typically within 30 days of the date of this Request for Additional Information (RAI). The items we seek are attached.

Please contact me by 4/16/2012 to confirm: (1) that the items are clear to you and to the responsive DEK staff without further discussion or (2) that a clarifying conference call is needed. Upon determination that the RAI items are clear and confirmation of when responses to these items are due, these draft RAI items will be considered to be in final form.

ME7110 is a complex project and we (Craig Sly of DEK and myself) have discussed methods for (1) improved movement of RAI information, (2) improved responsiveness to NRC staff requests, and (3) more flexibility for DEK to schedule RAI response activity, over that associated with more rigidly defined RAI milestone events. This and subsequent RAI traffic will be tracked by an individual identifier to provide the associated response by the individualized “request by” date.

Docketing will take place on groups of RAI item responses based on close completion schedules rather than close issuance schedules, as is now customary. Thus, if DEK can respond with individual information in 5 days, the “request by” date will be shortened and will be received sooner than the rest of the items, although its docketing event might coincide with the original set of items or with those RAI items originating from another Technical Branch.

We will periodically assess when this new process is of mutual benefit while conforming to the regulation for processing amendment requests and their associated RAIs.

A. AADB RAI Items

The RAI items requested by AADB (Atmospheric Dispersion Review Only, by Reviewer Brown) are assigned the following tracking numbers.

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ME7110-RAII-AADB-Brown-002-2012-05-13
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ME7110-RAII-AADB-Brown-004-2012-05-13
ME7110-RAII-AADB-Brown-005-2012-05-13
ME7110-RAII-AADB-Brown-006-2012-05-13
ME7110-RAII-AADB-Brown-007-2012-05-13

The following request for additional information is associated with Attachment 4 to the August 30, 2011 letter and includes comparison estimates generated by NRC staff to facilitate its review of the LAR.

AADB RAI 1 (ME7110-RAII-AADB-Brown-001-2012-05-13)

Section 3.1, "Determination of Atmospheric Dispersion Factors (χ/Q)," of Attachment 4 states that, during review of the meteorological data, the meteorologists observed that there was a change in the distribution of the atmospheric stability classes in the data during early January of 2005 and noted that the Kewaunee plant process computer was replaced in January 2005. An effort was made to determine the cause of this shift in stability class distribution. The algorithm used to calculate the stability classes was examined and found to comply with requirements and methods. The conclusion reached was that the change in stability class distribution was tied to the replacement of the plant process computer, but no conclusion could be reached on whether the stability class distribution, before the plant process computer change, was necessarily incorrect. The LAR also stated that stability classes since January 2005 were found to compare well with data from the Point Beach Nuclear Plant site which is located a few miles south of Kewaunee.

a. Please describe any changes in the Kewaunee meteorological measurement and data processing program from 2002–2006 other than the change in the plant process computer.

b. Provide a description of the requirements and methods to which the plant process computer algorithm was found to comply.

c. Describe any revisions that were made to the requirements and methods of the plant process computer algorithm since 2001.

d. Select a representative hour of data between January 2002 and December 2004 and a second hour between February 2005 and December 2006. Provide a step-by-step numerical explanation of how each of the temperature difference measurements were converted to each associated atmospheric stability category.

e. In general, unstable conditions are expected to occur very infrequently at night and were reported to occur at Kewaunee only a few times at night in 2002–2004. Explain the noticeable increase in occurrence of unstable conditions at night in 2005–2006 and the increase in stability class A conditions overall from an average of approximately 1.8 percent in 2002–2004 to an average of approximately 13.8 percent in 2002–2004. In addition, discuss the occurrence of stability category A for periods longer than 12 consecutive hours in 2005–2006 (maximum length of 41 consecutive hours) as compared with the maximum length of occurrence in 2002–2004 of 10 hours.

f. Discuss the decrease in the frequency of occurrence of stability class E from approximately 35 percent in 2002–2004 to approximately 20 percent in 2005–2006.

g. Were any sigma theta wind measurements used to determine the atmospheric stability category?

AADB RAI 2 (ME7110-RAII-AADB-Brown-002-2012-05-13)

Please provide a detailed description of how measurements were made to obtain the raw meteorological data and the subsequent technical review and data validation process to generate the "008 ARCON96MetData.txt" input file. Discuss instrument calibrations with respect to Regulatory Guide 1.23, "Onsite Meteorological Programs," specifications, and data substitutions or modifications, if any were made. Include a chronology, the specific criteria used to determine the validity of the data, and general qualifications of personnel who performed the review and processing of the data.

In addition, please discuss the following:

a. Calendar years 2002, 2003 and 2004 each end with 3 days of invalid upper wind data, but the first hour of each subsequent calendar year does not begin with invalid data,

b. Blank fields,

c. Data fluctuations between reported valid and invalid observations over a relatively short period of time, (e.g., 2002 upper wind direction data, day 68, hour 8, through day 69, hour 21, being generally invalid data but, 10 hours in three clusters, identified as valid) and basis for confidence in data validity,

d. For wind data, the same or essentially same value repeated for a series of consecutive hours (e.g., 2004, a lower level wind speed of 24 from day 178, hour 21, through day 179, hour 12, and in 2005, a lower level wind direction of 316 and upper level wind direction of 326 for day 79, hour 9, through day 79, hour 23),

e. Wind speeds in 2004 that result in a reported decrease with height approximately 6 percent of the year compared with the reported average frequency of wind speed decrease with height wind of about 2 percent during years 2002, 2003, 2005, and 2006, and

f. The relatively high frequency of reported light wind speeds at the lower measurement level in 2005 (e.g., day 218, hour 19, through day 219, hour 9; day 248, hour 19, to day 250, hour 9), in comparison with the other years, with light wind speed occurrence at the upper level appearing to be relatively similar all five years.

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Page 28 of Attachment 4 states: "Intuitively, an increase in the percentage of highly unstable wind conditions should cause the resulting atmospheric dispersion factors to be smaller. Based on the stability class distribution, it was believed that use of only the final 2 years of data would result in smaller χ/Q values. Use of only the first 3 years of data could be overly conservative. Since the last two years of data meet quality standards and compare favorably to data recorded for the same period at Point Beach, the use of only the first 3 years of data, which contain a larger distribution of stable atmospheric conditions for unknown reasons, did not seem appropriate. Therefore, the meteorological data for all 5 years were used and are believed to be appropriate and conservative."

Input data should be of high quality. Please provide further justification for use of the 2002–2006 data period. The ARCON96 and PAVAN computer codes assess atmospheric dispersion based on the joint occurrence of wind speed, wind direction, and atmospheric stability. NRC staff notes that its cursory estimates indicate that the 2002–2004 data files resulted in generally larger χ/Q values for ARCON96 and smaller χ/Q values for PAVAN for the limiting cases than for the 2005–2006 data files. Therefore, staff has not concluded at this time that use of the first three years ensures conservatism.

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Attachment 4, p. 137, of the LAR states: "Using linear interpolation the 95th percentile wind speed at this elevation is 8.6 meters per second. Five times this speed is 43 meters per second." Please justify that wind speed increases linearly with height at the Kewaunee site.

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The LAR states that Figure 3.1-1, "Kewaunee Source and Receptor Points," of Attachment 4 provides a relative scaled drawing of the Kewaunee Power Station building orientation and control room location showing all identified release points and receptors. The figure is very informative, but does not appear to be drawn entirely to scale and/or to have all sources and receptors positioned on the figure based upon the scale. For example, Table 3.1-1, "Line-of Sight Horizontal Distance from Source to Receptor," of Attachment 4, lists the distances from the "SG [steam generator] B PORV [power operated relief valve]" and "SG B Dumps" to the Control Room Intake as 12.06 meters (m) and 24.81 m, respectively. However, in Figure 3.1-1, the SG B Dumps appear to be slightly closer to the Control Room Intake than the SG B PORV. Please revise Figure 3.1-1 to provide the scaled position of each source and receptor, as appropriate, to confirm the information provided in Table 3.1-1 and Table 3.1-2, "Direction from Receptor to Source," of Attachment 4.

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Page 29 of Attachment 4 states: "As a result of the analyses documented in this LAR, the alternate control room intake will be restricted from use. This restriction is required because of the χ/Q that would result due to the close proximity of the alternate intake to various release points; one of which is < [less than] 10 m from the alternate intake. Administrative controls will be in place to assure the alternate control room intake is closed and prohibit its use during normal operation, following an accident, or while moving recently irradiated fuel."

a. With regard to Figure 3.1-1, where is the alternative CR intake?

b. Describe the conditions under which its use is permitted.

c. Provide the inputs to the CR atmospheric dispersion factor (χ/Q value) estimates for each design basis accident which could occur when the alternative CR intake is in use.

AADB RAI 7 (ME7110-RAII-AADB-Brown-007-2012-05-13)

Please confirm that the values in Tables 3.1-1 and 3.1-2 are correct. For example, is the distance from the Auxiliary Building Stack and Equipment Hatch to the Control Room Intake 39.60 m for both source locations?

B. SCVB RAI Items

The RAI items requested by SCVB (Reviewer Torres) are assigned the following tracking numbers.

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ME7110-RAII-SCVB-Torres-002-2012-05-12

ME7110-RAII-SCVB-Torres-003-2012-05-12

After reviewing the request for a license amendment to revise the technical specifications to adopt of TSTF-448 for Kewaunee Power Station, the Containment and Ventilation Branch (SCVB) determined that additional information is needed in order to continue the review.

SCVB RAI 1 (ME7110-RAII-SCVB-Torres-001-2012-05-12)

TSTF-448 "Control Room Habitability", was developed for plants with pressurized control room envelopes. You stated that your plant has a non-pressurized control room envelope. Note that in the programs and manuals section of the standard technical specifications (STS) as modified by TSTF-448 revision 3, paragraph (d) of section [5.5.18], "Control Room Envelope Habitability Program,", specifies a differential pressure (dp) test to be conducted between performances on inleakage testing for the purpose of providing input to a periodic assessment of the control room envelope (CRE) boundary. The NRC staff recognizes that non-pressurized control room envelopes may not be able to conduct a dp test, nevertheless, the staff believes that all plants requesting adoption of TSTF-448 should include in their request, a method to collect data that will serve as input in a periodic assessment of the CRE boundary. This position is supported by the technical analysis section of the TSTF-448 revision 3 on page 8 where an explanation of the basis for paragraph (d) is provided. Consequently, the staff is requesting that you provide a method to collect data, and an explanation of how you intend to use it, that can be use as input to a periodic assessment of your CRE boundary. The method should, to the extent practicable, provide information that can be used in a manner similar to the manner in which the information is to be used that is requested by paragraph (d) of section [5.5.18] of the programs and manuals section of the STS as modified by revision 3 of TSTF-448.

SCVB RAI 2 (ME7110-RAII-SCVB-Torres-002-2012-05-12)

In attachment 3 to your letter dated July 25, 2011 you provided a mark-up of the technical specification (TS) Bases pages. On page B.3.7.10-9 you referred to NEI 99-03 Section 8.4 and Appendix F and to Reference 5 of the attachment. Reference 5 is NEI 99-03, "Control Room Habitability Assessment" dated March 2003. The Technical Specifications Task Force (TSTF) determined that this reference is in error (see the TSTF letter to the NRC dated December 29, 2006, Agencywide Document and Management System (ADAMS) Accession No. ML063630467). The correct reference is NEI 99-03, "Control Room Habitability Assessment", dated June 2001. In order to be consistent with both the intent of TSTF-448 Revision 3 and NEI 99-03 dated June 2001, you are requested to update your submittal to refer to of NEI 99-03 dated June 2001. However, if you insist on using NEI 99-03 dated March 2003 you will need to provide this document on the NRC docket for NRC staff review and approval and be prepared to provide acceptable answers to all questions that may result from that review.

SCVB RAI 3 (ME7110-RAII-SCVB-Torres-003-2012-05-12)

Please verify that Reference 4 "Regulatory Guide 1.196, Rev. 2" is the correct version of the regulatory guide being used at Kewaunee.

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Email Number: 330

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