NRR-PMDAPEm Resource

From:	Singal, Balwant
Sent:	Wednesday, June 14, 2017 1:15 PM
To:	Muilenburg William T (wimuile@WCNOC.com)
Cc:	Good Nicole R
Subject:	Request for Additional Information - License Amendment Request for Transition to Westinghouse Core Design and Safety Analyses including Adoption of Alternative Source Term (CAC No. MF9307)
Attachments:	MF9307-RAI (EICB&RHM1).docx

The U.S. Nuclear Regulatory Commission (NRC) staff is in the process of reviewing the subject LAR and has identified the need for additional information described in the attachment to this e-mail. Draft request for additional information (RAI) was transmitted to Wolf Creek Nuclear Operating Corporation (WCNOC) on May 31, 2017 and a clarification call was held on June 13, 2017. WCNOC agreed to respond to the RAI request within 30 days from the date of this e-mail. Please note that Reference to Chapter 7 of NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants," has been updated from Revision 5 (March 2007) in the Draft RAI to Revision 7 (August 2016).

Also, please note that several technical branches have been assigned for review of this license amendment request and this is only a partial RAI request.

Thanks.

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REQUEST FOR ADDITIONAL INFORMATION

LICENSE AMENDMENT REQUEST FOR

TRANSITION TO WESTINGHOUSE CORE DESIGN AND SAFETY ANALYSIS

INCLUDING ADOPTION OF ALTERNATIVE SOURCE TERM

WOLF CREEK GENERATING STATION

(CAC NO. MF9307)

By letter dated January 17, 2017 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML17054C103), as supplemented by letters dated March 22 and May 4, 2017 (ADAMS Accession Nos. ML17088A635 and ML17130A915, respectively), Wolf Creek Nuclear Operating Corporation (WCNOC, the licensee), submitted a license amendment request (LAR) for the Wolf Creek Generating Station (WCGS) to transition to Westinghouse Core Design and Safety Analysis, including adoption of the alternative source term (AST).

The proposed LAR would replace the WCNOC methodology for performing core design, non-loss-of-coolant-accident (non-LOCA) and LOCA safety analyses to the standard Westinghouse methodologies for performing these analyses, and associated technical specification (TS) changes. The proposed amendment would also revise WCGS TSs and the Updated Safety Analysis Report Chapter 15 radiological consequence analyses using an updated accident source term consistent with Title 10 of the *Code of Federal Regulations* (10 CFR), Section 50.67, "Accident source term."

The U.S. Nuclear Regulatory Commission (NRC) staff requests for the following additional information for completing the review of the proposed LAR.

Instrument and Controls Branch (EICB)

NUREG-0800, "Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR [Light-Water Reactor] Edition," Chapter 7, "Instrumentation and Controls," August 2016 (ADAMS Accession No. ML16020A049), defines the acceptance criteria for this review. Standard Review Plan Chapter 7 addresses the requirements for instrumentation and control systems in light-water nuclear power plants. The regulatory requirements and guidance which the NRC staff considered in its review are as follows:

- 10 CFR 50.36(c)(1)(ii)(A) requires in part that where a limiting safety system setting is specified for a variable on which a safety limit has been placed, the setting must be so chosen that automatic protective action will correct the abnormal situation before a safety limit is exceeded. If, during operation, it is determined that the automatic safety system does not function as required, the licensee shall take appropriate action, which may include shutting down the reactor.
- 10 CFR 50.36 (c)(2)(i) requires that the TSs include limiting conditions for operation (LCOs) for equipment required to ensure safe operation of the facility. When an LCO for operation of a nuclear reactor is not met, the licensee shall shut down the reactor or follow any remedial action permitted by the TSs until the condition can be met.
- 10 CFR 50.36 (c)(3) states TS Surveillance Requirements (SRs) relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met. 10 CFR 50.36, "Technical specifications," states, "Each applicant for a license authorizing operation of a production or utilization facility shall include in his application proposed technical specifications in accordance with the requirements of this section." Specifically, 10 CFR 50.36(c)(2)(ii) sets forth four

criteria to be used in determining whether a limiting condition for operation is required to be included in the TS.

- 10 CFR 50.55a(h) requires that the protection systems must meet the requirements in Institute of Electrical and Electronics Engineers (IEEE) Std. 279–1968, "Proposed IEEE Criteria for Nuclear Power Plant Protection Systems," or the requirements in IEEE Std. 279–1971, "Criteria for Protection Systems for Nuclear Power Generating Stations," or the requirements in IEEE Std. 603–1991, "Criteria for Safety Systems for Nuclear Power Generating Stations," and the correction sheet dated January 30, 1995.

EICB-RAI 1

The LAR would replace the Allowable Value (AV) for Table 3.3.1-1 Function 10, "Reactor Coolant Flow – Low," for "Normalized Flow." This replacement is necessary for consistency with the assumptions of the new safety analysis methodology (i.e., the use of Normalized Flow, instead of design loop flow). WCAP-18083-P, Revision 0, "Westinghouse Revised Thermal Design Procedure Uncertainty Calculations for the Wolf Creek Generating Station," November 2016 (Enclosure 1 to letter dated March 22, 2017) defines the "Normalized Flow" as the reactor coolant system (RCS) flow normalization to the RCS flow calorimetric. However, it is not clear how the formula describes in the enclosure are used.

Please describe how procedurally the normalization process is carried out. The 12 hour surveillance test pertains to RCS Flow is SR 3.4.1.3, "Verify RCS total flow rate is > 3.71 x 104 gpm [gallons per minute] and greater than or equal to the limit specified in the COLR [core operating limit report]." Alternately, please provide the NRC staff with a copy of the 12 hour surveillance procedure.

EICB-RAI -2

The proposed amendment would add a new TS LCO 3.1.9, "RCS Boron Limitations <500°F." This modification necessities modification of the requirements for RTS trip Function 2.b, Power Range Neutron Flux - Low, in TS Table 3.3.1-1. Specifically, the Applicability for reactor trip system (RTS) trip Function 2.b will be revised and new Conditions V, W, and X will be added to LCO 3.3.1. The LAR states that Condition V will be similar to existing Condition E. However, the NRC staff notes the end state for the plant Condition V will require the initiation of actions aimed at precluding an uncontrolled rod cluster control assembly bank withdrawal event from occurring or providing sufficient shutdown margin should this event occur while the existing condition E does not contain this requirement.

Please provide additional information to justify inclusion of this additional requirement.

Hydrology and Meteorology Branch (RHM1)

RHM1-RAI-1

10 CFR 50.67(b)(2)(i) requires a licensee seeking to revise its current accident source term in design basis radiological consequence analyses to provide an evaluation of the consequences of applicable design basis accidents to demonstrate that adequate radiation protection is provided to permit access to and occupancy of the control room under accident conditions. Methods acceptable to the NRC staff for determining atmospheric dispersion factors (or X/Q values) in support of design-basis control room radiological habitability assessments at nuclear power plants can be found in RG 1.194, "Atmospheric Relative Concentrations for Control Room Radiological Habitability Assessments at Nuclear Power Plants," June 2003 (ADAMS Accession No. ML031530505).

RG 1.194 provides guidance on the use of the ARCON96 atmospheric dispersion model for determining X/Q values to be used in design basis evaluations of control room radiological habitability analyses. Section 3.2 of RG 1.194 states that in order to determine source-receptor bounding combinations, it is necessary to consider the distance, direction, release mode, and height of the various release points to the environment in relation to the various control room intakes. Additional parameters, such as those used in establishing plume rise, may need to be considered in determining the bounding combination.

Section 4.1.2, “Atmospheric Dispersion Factors – Control Room and Technical Support Center, “Full Scope Implementation of Alternative Source Term,” (Enclosure IV to letter dated January 17, 2017) describes the development of the X/Q values used in the control room (CR) and technical support center (TSC) radiological analysis. Tables 4.1.2-1(a), 4.1.2-1(b), and 4.1.2-2 in Enclosure 4 provide the ARCON96 input parameters for the Emergency Control Room Air Intake, Normal Control Room Air Intake, and the TSC Air Intake, respectively. The staff has identified 4 release heights in these tables that appear to conflict with each other. Please resolve the following potential conflicts by either updating the Enclosure 4 tables or justifying the use of the release heights listed below.

Source Release Heights

		Source			
Table No.	Receptor	Unit Vent Stack	MSSVs/ARVs[1] Vent	Turbine-Driven AFW[2] Exhaust Vent	Radwaste Building
4.1.2-1(a)	Emergency CR Air Intake	66.25 meters (m)	34.29 m	13.87 m	6.10 m
4.1.2-1(b)	Normal CR Air Intake	66.17 m	34.29 m	14.05 m	17.07 m
4.1.2-2	TSC Air Intake	66.25 m	35.71 m	13.87 m	2.84 m

[1] Main Steam Safety Valves/Atmospheric Relief Valves
[2] Auxiliary Feedwater