January 25, 2008

LICENSEE: Dominion Energy Kewaunee, Inc.

FACILITY: Kewaunee Power Station

SUBJECT: SUMMARY OF JANUARY 7, 2008, MEETING WITH DOMINION ENERGY KEWAUNEE INC., ON THE LICENSE AMENDMENT REQUEST REGARDING SEISMIC METHODOLGY FOR ANALYSIS OF AUXILIARY BUILDING CRANE (TAC NO. MD7301)

On January 7, 2008, the U.S. Nuclear Regulatory Commission (NRC) held a Category 1 public meeting with Dominion Energy Kewaunee, Inc. (the licensee), at NRC Headquarters, One White Flint North, 11555 Rockville Pike, Rockville, Maryland. The purpose of the meeting was to discuss issues related to the licensee's application dated November 9, 2007 (Agencywide Documents Access and Management System (ADAMS) Accession No. ML073180499). In this application, the licensee requested NRC approval to use a new methodology to perform the seismic qualification analysis for the auxiliary building crane at Kewaunee Power Station (KPS). The non-single-failure-proof auxiliary building crane is being upgraded to a single-failure-proof design through replacement of the crane trolley and modification of the existing crane bridge. The proposed methodology is not currently described in the KPS Updated Safety Analysis Report or the code of reference applicable to the crane. The existing auxiliary building crane, with modifications, will be used to lift NUHOMS dry fuel casks in support of the independent spent fuel storage facility, which is currently being constructed at KPS. As a result of the design of the single-failure proof trolley, the new trolley is about 20 tons heavier in weight. A list of attendees is provided as Enclosure 1.

As delineated in its handout slides (Enclosure 2), the licensee presented information regarding the purpose of the amendment application, which proposes to use rolling of the crane wheels under limited circumstances in the seismic analysis. Without consideration for this rolling, extensive modification of the crane bridge and building would be required. The licensee also noted that the remainder of the crane seismic analysis was performed in accordance with the American Society of Mechanical Engineers Standard NOG-1, "Rules for Construction of Overhead and Gantry Cranes (Top Running Bridge, Multiple Girder)," 2004 Edition. In addition, the licensee described features of the design and configuration of the crane and trolley. In particular, the licensee discussed the performance features of the crane motor brake, which restricts movement of the two drive wheels. There are six idler wheels also associated with the crane. The licensee's revised seismic analyses were performed assuming the maximum 125 tons loaded on the main hoist hook.

The licensee further discussed its basis for assuming that rolling in the seismic analysis model would occur after the inertia force overcomes the motor brake torque for the crane and the trolley. The licensee described its use of a technical paper by N. Mostaghel and J. Tanbakuchi to modify the single degree of freedom oscillator in the traditional response spectrum. Regarding the seismic analysis method, the licensee also discussed acceleration response spectrum and stated that for low frictional coefficients, the response spectra in the frequency region of interest was not very sensitive to the input time-history. The licensee also described its three dimensional finite element model for the crane and rail system.

On the basis of the licensee's presentation of information, the NRC staff expressed concerns with issues regarding the performance of a dynamic analysis and consideration of elasticity in the girders, kinetic energy of translation of the crane and rotation of the drive assembly components, and other factors. The staff also asked questions regarding the application of the technical paper to the KPS crane system such that it could be shown that it was a conservation technology. The specific questions from the staff are detailed in Enclosure 3 and will require further information from the licensee. The licensee will provide its responses to the NRC staff questions in a separate correspondence, which will be submitted formally to the NRC as part of the license amendment review.

No members of the public were in attendance. Public Meeting Feedback forms were not received.

Please direct any inquiries to me at 301-415-1457.

/RA/

Patrick D. Milano, Senior Project Manager
Plant Licensing Branch III-1
Division of Operating Reactor Licensing
Office of Nuclear Reactor Regulation

Docket No. 50-305

Enclosures:
1. List of Attendees
2. Licensee Handout
3. Staff Questions

cc w/encls: See next page

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DATE	01/18/08	01/23/08	01/22/08	01/25/08

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Kewaunee Power Station

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Dominion Energy Kewaunee, Inc.
Meeting Regarding License Amendment Request
Licensing Basis for Internal Flooding Events
Monday January 7, 2008

List of Attendees

Nuclear Regulatory Commission

Name	Position/Title	Organization
Patrick D. Milano	Project Manager	NRR/Division of Operating Reactor Licensing (DORL)/Plant Licensing Branch 3-1 (LPL3-1)
Kamal Manoly	Branch Chief	NRR/Division of Engineering (DE)/Mechanical and Civil Engineering Branch (EMCB)
Mark Hartzman	Sr. Mechanical Engineer	NRR/DE/EMCB
Steven Jones	Sr. Systems Engineer	NRR/Division of Safety Systems (DSS)/Balance-of-Plant Branch (SBPB)
Sarah Bakhsh	Health Physicist	Region III/Division of Nuclear Materials and Safety (DNMS)/Decommissioning Branch

Dominion Energy Kewaunee, Inc.

Name	Position/Title
Lori Armstrong	Director, Nuclear Engineering
David Lohman	Project Manager, Design Engineering
Thomas Webb	Director, Safety and Licensing
Gerald Riste	Supervisor, Licensing

Dominion Resources Services

Name	Position/Title
Craig Sly	Engineer, Nuclear Licensing and Operations Support
Divakar Bhargava	Consulting Engineer, Engineering Mechanics, Nuclear Engineering
Charles Zalesiak	Civil Engineer

Contractors/Vendors

Name	Company
Jami Rubendall	American Crane & Equipment Corp.
Chang Chen	American Crane & Equipment Corp
Brian Gutherman	ACI Nuclear Energy Solutions

Public: None present

NRC Staff Questions Asked During Public Meeting

Regarding Seismic Analysis Methods for Auxiliary Building Crane

1. For the East-West Mid-span Case, the calculation of the "equivalent" coefficient of friction of 0.061 appears to be based on the assumption that the friction force acts on all eight wheels simultaneously. However, the friction (traction) force acts only on the two drive wheels, while the weight of the crane is distributed among the eight wheels. We request that you provide:

   A. The "equivalent" coefficient of friction based on the normal reactions acting on the two drive wheels, not on the total crane weight, and show all "free- body" diagrams used in the Mid-span Case analysis.

   B. Provide justification for the assumption of a rigid crane used in determining the "equivalent" coefficient of friction of 0.061.

2. The attached paper in LAR 234, "Response of Sliding Structures to Earthquake Support Motion," forms the basis for the analysis of the crane for both the Mid-span and End-span cases. This paper is applicable to sliding of a single degree of freedom elastic mass between a flat base structure and a flat ground.

   A. Show that the methodology of this paper is applicable to a structure on wheels rolling on a flat ground under seismic movement, where the friction is provided by torque on the driver wheel.

   B. The analysis in the paper are based on the El Centro N-S ground time history. Show that the acceleration and displacement spectra based on the Housner-based acceleration time-history at the elevation of the crane envelop the acceleration and displacement spectra of the paper.

   C. Provide a discussion of the damping used to develop the Housner-based acceleration time-history at the elevation of the crane

   D. Since the paper does not include the vertical seismic acceleration in the sliding analysis of the paper, provide a discussion of the effect of this acceleration on the crane analysis.

3. For the East-West End-span Case, the crane is an un-symmetric structure.

   A. State the basis for assuming that the center of mass is in the middle of the crane.

   B. Provide justification why the "equivalent" coefficient of friction of the Mid-Span case is applicable to this case.

ENCLOSURE 3

C. Provide a detailed discussion of the 3-D analysis of the crane and show how the results from the paper were applied. Show all free-body diagrams used in the analysis.

D. Show that the unsymmetrical motion of the crane has no effect on the rails.

4. Kewaunee Power Station updated safety analysis report Section B.8 states that the stability of the crane is assured by fixed, fitted rail yokes that allow free rolling movement but prevent the wheels from being lifted or derailed. The bridge and trolley wheels are equipped with electrically activated, spring set brakes. Upon loss of power or when the crane or trolley is not under operator control, the springs activate the brake, locking the wheels firmly into place to prevent rolling out of position.

   A. Provide a diagram of the rail yokes and their location on the bridge.

   B. Provide a description of the brakes, including the applicable coefficient of friction.

   C. Provide justification for assuming that the drive wheels will not slip before the disc brake slips.

   D. Provide an evaluation demonstrating that as a result of the heavier trolley, the wheels will not lift or derail under the seismic loading.

5. In the section titled “Member Stress and Connection Checks,” provide a description and detailed discussion of the method for calculating the stresses due to the dead weight and seismic loading.