

May 27, 2003

MEMORANDUM TO: L. Raghavan, Chief, Section 1
Project Directorate III
Division of Licensing Project Management

FROM: John G. Lamb, Project Manager, Section 1 /RA/
Project Directorate III
Division of Licensing Project Management

SUBJECT: KEWAUNEE NUCLEAR POWER PLANT - PHONE CALL HELD ON
MAY 22, 2003, REGARDING MEASUREMENT UNCERTAINTY
RECAPTURE POWER UPRATE (TAC NO. MB7225)

By letter dated January 13, 2003 (ADAMS Accession No. ML030220409), supplemented February 27 (Accession No. ML030700503), March 6 (Accession No. ML030780174), March 14 (Accession No. ML030840684), and April 30, 2003 (Accession No. ML031270367), to the Nuclear Regulatory Commission (NRC), the Nuclear Management Company, LLC (NMC) submitted a proposed change to the facility operating license and proposed changes to the technical specifications for a 1.4-percent measurement uncertainty recapture (MUR) power uprate at the Kewaunee Nuclear Power Plant (KNPP).

During its review of the NMC submittal, as supplemented, the NRC staff determined that a conference call with NMC was warranted to clarify information contained in the January 13, 2003, submittal, as well as information presented in the February 27, March 6, March 14, and April 30, 2003, letters. A conference call was held on May 22, 2003, between the NRC staff (S. Peters, W. Lyon, M. Barrillas, and myself), NMC staff (L. Gunderson, H. Hanneman, and G. Arent), and Westinghouse (R. Owoc, W. Moumou, and W. Liguers) to discuss the calorimetric reactor coolant system (RCS) flow equation.

We discussed three clarifying questions in the conference call: (1) clarify the meaning of reactor coolant pump (RCP) heat addition (Q_p). You state it to be the "RCP heat addition." Is this the same as the total energy added to the RCS by an RCP at the RCP location or does it have a different meaning? If the latter, please explain the meaning, (2) primary system net heat losses (Q_L) is defined as "primary system net heat losses." Define this more completely. Our concern is that this appears to refer to the total RCS as opposed to that portion of the RCS located from the cold leg resistance temperature detectors (RTDs) to the hot leg RTDs (in the direction of RCS flow). Is this correct? Please explain, and (3) do you use both local RCS pressure and RCS temperature in determining hot leg enthalpy (h_H) and cold leg enthalpy (h_C)? (As opposed, for example, to assuming enthalpy (h) corresponds to the value at the saturation temperature since one often does not consider h to be a function of pressure.)

NMC and Westinghouse responded to the clarifying questions: (1) Q_p is the gross heat addition from the RCP. It is energy into the RCS by the RCP with an 85 percent hydraulic efficiency, (2) Q_L is the net heat losses such as heat loss through insulation, conduction through

pipe supports, control rod drive mechanisms, charging and letdown, seal injection flow, and pressurizer spray, and (3) the enthalpies are determined for both the hot leg and cold leg using the pressurizer pressure. During the discussion, the NRC staff learned that RTD bypass flow is not considered in calculation of RCS flow rate. The elbow tap flow equals the RCP flow which equals the reactor vessel flow rate. Also, a discussion was held regarding the flow rates in the bypass, which NMC and Westinghouse stated were 150 gallons per minute (gpm) for the hot leg and 100 gpm for the cold leg. The licensee and Westinghouse representatives did not know the actual relative locations of such flows as associated with letdown, makeup, and the pressurizer surge line with respect to the effective temperature measurement locations.

The NRC staff did not request any actions from NMC and the NRC stated that it would continue processing the proposed MUR power uprate amendment request.

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