

October 2, 2000

MEMORANDUM TO: Stuart A. Richards, Director
Project Directorate IV & Decommissioning
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Robert M. Pulsifer, Project Manager, Section 2
Project Directorate I */RA/*
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF PUBLIC MEETING WITH BOILING WATER REACTOR
OWNERS GROUP TO DISCUSS DC-MOTOR PERFORMANCE
METHODOLOGY

On August 30, 2000, the NRC staff held a public meeting at the NRC One White Flint North office building with the Boiling Water Reactor Owners Group (BWROG) to discuss a methodology developed by the BWROG to provide improved predictions of the performance of dc-powered motor-operated valves (MOVs). Participants at the public meeting included NRC staff members from the Offices of Nuclear Reactor Regulation and Nuclear Regulatory Research; an NRC staff contractor from the Idaho National Engineering and Environmental Laboratory (INEEL); representatives of BWROG and its contractor (MPR Associates); and a representative of Limatorque Corporation. Attachment 1 is a list of the meeting participants. The BWROG presentation slides used during the meeting are available under ADAMS accession number ML003752922.

On June 23, 2000, BWROG forwarded Topical Report NEDC-32958 (Revision 0, dated March 2000), "BWR Owners' Group DC Motor Performance Methodology - Predicting Capability and Stroke Time in DC Motor-Operated Valves," for NRC staff review in preparation for the August 30 meeting. During the meeting, the BWROG and its contractor (MPR Associates) described the purpose of the dc-powered MOV program, and discussed the application and validation of the methodology. Recently, INEEL completed a study sponsored by the NRC Office of Nuclear Regulatory Research as documented in NUREG/CR-6620 (May 1999), "Testing of dc-Powered Actuators for Motor-Operated Valves," that raised concerns regarding the current industry guidance for predicting the performance of dc-powered motor actuators used to operate valves in nuclear power plants. In response to those concerns, the BWROG established a proactive effort to develop an updated methodology to predict the performance of dc-powered MOVs.

The BWROG methodology evaluates dc-powered MOV actuator performance throughout the valve stroke under various loading conditions. By means of a computer spreadsheet program, the methodology calculates the required thrust to operate the valve; motor torque, current, voltage, speed, and heat-up; and gearbox efficiency at each stroke position. The methodology also determines the capability margin of the motor actuator, the maximum allowable thrust

setting at the torque switch trip position and under unwedging conditions, and the stroke time for the valve. The BWROG used vendor motor performance curves and test data from the INEEL study and industry sources in developing its methodology. The BWROG found that the performance curves for three motors did not match the available test data. Limitorque is reviewing the performance curves and data for those three motors. The BWROG compared the methodology to test data from in-plant flow tests for 7 MOVs under various conditions, and found the predicted stroke times to bound the measured stroke times for 20 valve strokes with 2 additional strokes having slightly higher than predicted stroke times.

During the August 30, 2000, meeting, the BWROG indicated that Limitorque is planning to issue a technical update addressing the dc-motor performance methodology. The Limitorque representative stated that the technical update is scheduled to be issued during the week of October 16, 2000. Because BWR plants typically include more safety-related dc-powered MOVs (10 to 15 per plant) than pressurized-water reactor plants, the BWROG has taken the lead in this effort but is cooperating with the other owners groups to share its methodology. The BWROG stated that a recommended schedule for licensees to incorporate the updated dc-motor performance methodology into their MOV programs is under consideration. The BWROG indicated that the schedule might be available for discussion during the NRC/BWROG management meeting on September 13, 2000.

At this time, the BWROG has not requested the NRC staff to prepare a safety evaluation on the dc-motor performance methodology. The BWROG suggested that a reference to the dc-motor performance methodology in an information notice (IN) might be a preferred approach. For example, the NRC staff issued IN 96-48 (August 21, 1996), "Motor-Operated Valve Performance Issues," and its Supplement 1 (July 24, 1998) to alert licensees to updated guidance for predicting ac-powered MOV actuator output and to identify initial efforts for the evaluation of dc-powered MOV output. The BWROG indicated that the NRC staff may request a copy of the computer spreadsheet program of the methodology for its review in preparing an IN through a letter to Mr. James M. Kenny, Chairman, BWROG. The NRC staff is planning to consider supplementing IN 96-48 to alert licensees to the improved guidance on dc-powered MOV motor actuator output following issuance of the Limitorque technical update.

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Attachment: List of Meeting Attendees

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LIST OF MEETING ATTENDEES
BETWEEN THE BWROG AND THE NRC
REGARDING THE DC MOTOR ACTUATION PROGRAM

August 30, 2000

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P. McQuillan	Limitorque
Paul Damerell	MPR
Tom Walker	MPR
Glenn Warren	BWROG/SNC
Jim Kenny	PPL/BWROG
Wendell Fiock	GE/BWROG
A. Mayakimadi	Detroit Edison
Kevin G. DeWall	INEEL
Robert Pulsifer	NRC
Stephen Tingen	NRC
Eugene Imbro	NRC
Michael Marshall	NRC
Jerry Jackson	NRC
Thomas Scarbrough	NRC
David Terao	NRC
Ken Karwoski	NRC