

December 10, 2002

MEMORANDUM TO: John A. Zwolinski, Director
Division of Licensing Project Management
Office of Nuclear Reactor Regulation

FROM: Michael E. Mayfield, Director /**Daniel Dorman For**/
Division of Engineering Technology
Office of Nuclear Regulatory Research

SUBJECT: MOV STEM LUBRICANT AGING RESEARCH

The subject report, INEEL/EXT-02-00975, "MOV Stem Lubricant Aging Research," September 2002, is being submitted for your use. It satisfies the Task 2 requirement in NRR User Need Request 2002-014. This report summarizes the results of tests performed to evaluate the effects of aging on the stem friction coefficient of some lubricants commonly used to lubricate motor operated valve (MOV) stems. These tests were conducted at the Idaho National Engineering and Environmental Laboratory (INEEL) using the motor-operated valve load simulator (MOVLS). The MOVLS was developed at INEEL to perform various types of diagnostic testing on MOV actuators with load profiles that simulate the opening and closing of valves under dynamic fluid forces.

This research supports the agency's performance goal of maintaining plant safety by providing insights on aging effects of valve stem lubricants. This insight could be used in NRR's on going MOV performance monitoring activities. In addition, results from this research reduce uncertainties associated with MOV valve factor assumptions used by industry in designing and maintaining MOVs to ensure that valves will perform their intended safety functions.

The report, INEEL/EXT-02-00975, provides results of research regarding the performance of two MOV valve stem lubricants (Chevron SRI and Mobil Mobilgrease 28) under aging conditions. The report also provides test results on the stem friction performance of a new lubricant (MOV Long Life) under normal, elevated temperature, and aged conditions. The MOV Long Life lubricant is being proposed by the nuclear industry for use on valve stems, and in actuator and limit switch gearboxes, as a replacement for the industry's most common MOV lubricant, Exxon Nebula EP1 which is being discontinued. These research results support the agency's safety goal by providing independent information for use in the evaluation of extensions of MOV stem lubrication intervals requested by licensees as part of their risk-informed, performance-based maintenance programs, and for the long term monitoring of the licensees' MOV programs. The lubrication information regarding the stable performance of the MOV Long Life will be important because of the nuclear industry's plans to use MOV Long Life as a primary replacement lubricant. These research results complement the earlier research results contained in NUREG/CR-6750, "Performance of MOV Stem Lubricants at Elevated Temperature," October 2001. The stem lubricants tested did not identify any significant degradation in their performance due to aging during the test period.

J. Zwolinski

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This report addresses comments provided by NRR during a meeting on August 14 and in a memorandum to me from Richard Barrett dated August 19, 2002. We will proceed with preparation of a NUREG/CR report to formally publish these results.

Attachment: As stated

CONTACT: Jerry E. Jackson, DES/DET 301-415-6656

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M. Fields, D. Terao, R. Barrett, T. Scarbrough, E. Imbro, ERAB r/f

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