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May 2, 2018

MEMORANDUM TO: George A. Wilson, Director
Division of Materials and License Renewal
Office of Nuclear Reactor Regulation

FROM: Brian E. Thomas, Director */RA Christopher M. Regan Acting for/*
Division of Engineering
Office of Nuclear Regulatory Research

SUBJECT: IMPENDING PUBLICATION OF TECHNICAL LETTER REPORT,
PNNL-26993, ENTITLED "BLIND TESTING OF PARENT OPEN
TECHNIQUES"

This is to notify you of the impending publication of the enclosed technical letter report (TLR) entitled "Blind Testing of PARENT Open Techniques." This TLR was prepared by Pacific Northwest National Laboratories (PNNL) as part of the international Program for Assessing the Reliability of Emerging Nondestructive Technologies (PARENT) project. This report documents work performed in support of Task 4 in User Need Request NRR-2013-009, "Evaluating the Reliability of Nondestructive Examinations of Vessels and Piping." RES plans to publish this TLR within 2 weeks from the date of this memo unless we hear otherwise from you.

This report documents the results from a blind round robin test conducted with emerging nondestructive examination (NDE) techniques that were applied in the PARENT open round robin testing. The PARENT open testing assessed a wide variety of novel and emerging NDE techniques to explore their potential for improving the performance of NDE in comparison to established techniques. Open testing is useful for performing a basic capability assessment, however, it has limitations with respect to assessing detection performance in this case and could introduce a bias in sizing due to the knowledge of the location of flaws. Thus, the present blind test was performed in an attempt to assess detection performance and to obtain a more confident assessment of sizing capability for techniques that demonstrated high potential in PARENT open testing. Although NDE performance depends on several factors, an implicit assumption of this effort is that technology is a significant factor in performance and that the best performance that can be expected is fundamentally limited by the technology.

This study concluded that several of the novel techniques exhibit detection performance that are as good as the established techniques. However, several of the novel techniques also exhibited a very high false call rate. This can probably be attributed to the experience of the teams performing these inspections. The open test teams, in general, were not individuals trained to perform examinations commercially. The data generated from this testing provides an understanding of the capabilities of various emerging NDE techniques and the results can be used to support evaluation of emerging inspection techniques in the future.

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Staff representatives from the Division of Materials and License Renewal in NRR have reviewed a draft of this TLR. Please notify the responsible RES contact if you have any questions concerning the impending public release of this TLR.

Enclosure:
As stated

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