

June 10, 2013

Joe Donahue
Vice President Nuclear Oversight
Executive Chairman
EPRI NDE Action Plan Committee
Duke Energy
410 S. Wilmington St.
PEB 6A
Raleigh, NC 27601-1849

SUBJECT: Reliability of Team Scanning during Ultrasonic Examination

Dear Mr. Donahue:

Dissimilar metal welds such as welds between austenitic stainless steel reactor coolant piping and low alloy steel reactor pressure vessel nozzles are required to be subjected to periodic nondestructive ultrasonic testing (UT) to fulfill the requirements of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code. The ASME Code requirements are incorporated, by reference, into Title 10, Part 50.55(a) of the Code of Federal Regulations (CFR).

Personnel who perform UT must be qualified as set forth by the ASME Code. In practice, examiners must pass difficult qualification tests where they use transducers and UT equipment to find implanted flaws in multiple mockups. During the qualification tests they have no knowledge of the size, number, nature or location of flaws in the test blocks, including knowledge of whether there are any flaws at all. They are required to find flaws that are present and to not mischaracterize geometric or other non-flaw indications as flaws, with a very high level of proficiency. Qualification levels include trainees and levels I, II and III where the higher level certifications require more experience and demonstrated prowess.

Team scanning is a practice where a Level II or III qualified examiner operates the UT instrument and observes the screen while a potentially lower level qualified individual manipulates the UT transducer at the location of interest. This practice is not prohibited by the ASME Code via an interpretation. North Anna experienced a failed UT exam of a dissimilar metal weld during 2012; the examination failed to find multiple large flaws. Team scanning was identified as a potential contributing cause of the UT failure.

As part of the root cause of the North Anna UT failure, the industry developed an NDE Improvement Focus Group (NFIG) which made 29 recommendations for improving NDE practices, procedures and training.

One of the recommendations involved improving team scanning by enhancing guidance for licensee controls and by investigating the reliability of the practice. NIFG issued guidance related to the use of team scanning. We understand that NIFG is planning a team scanning demonstration involving teams attempting to pass a qualification test.

The staff recently met with NFIG in a public meeting on March 18-19, 2013, to discuss the industry team scanning demonstration plan. At that time it was our understanding that industry's draft protocol permitted using a single team consisting of highly qualified examiners, testing on a very limited set of flaws, the use of open test blocks which could possibly provide the candidates prior knowledge of the location, nature and number of flaws, and permitting the candidates to retest until they achieve a passing score. The NRC agrees that it may be possible to learn a great deal about team scanning from this proposed test plan. The NRC disagrees, however, that the proposed test protocol, if implemented in the most liberal manner, would be sufficient to provide confidence that less qualified examiners who had no pre-knowledge of the nature, location and number of flaws could reliably detect flaws in the field.

The NRC is evaluating options to address issues with team scanning. The potential option could range from continuing to permit use of the current process for team scanning; to establishing conditions in a 10 CFR 50.55(a) rulemaking that would limit the permissible use of team scanning, or possibly eliminating it entirely. In order to make a better informed decision, the NRC staff encourages the industry to develop qualification information sufficient to provide confidence that less qualified examiners who had no pre-knowledge of the nature, location and number of flaws could reliably detect flaws in the field. Our thoughts for the test programs include:

1. A sufficient number of teams (e.g., four) should be included in the test matrix to provide evidence that more than one team is capable of succeeding at team scanning.
2. At least one of the teams should include personnel who hold the minimum level of certification that would be permitted to participate in team scanning evolutions.
3. A sufficient number of mockups and flaws should be used to establish statistical confidence in the results, which will be a function of the achieved probability of detection.
4. An initial series of investigations using open test specimens would provide information useful for designing the qualification test and for improving guidance and controls for the practice, but the information used to establish pass/fail statistics should be generated on blind mockups.
5. Re-testing opportunities should be limited, with the results of failed initial tests included in the overall statistics.

We look forward to continued interaction related to team scanning. If you have any questions regarding this matter please contact Tim Lupold at 301 415-6448.

Thank you,

/RA/

Patrick L. Hiland
Director, Division of Engineering
Office of Nuclear Reactor Regulation

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Patrick L. Hiland
Director, Division of Engineering
Office of Nuclear Reactor Regulation

DISTRIBUTION:

JoeW.Donahue@duke-energy.com

Gselby@EPRI.com

RDyle@EPRI.com

Kevin.j.hacker@dom.com

RHardies

SCumblidge JCollins

DAiley

WNorris

ACsontos

CNove

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OFFICE	NRR/DE	NRR/DE/EPNB	NRR/DE
NAME	RHardies	TLupold	PHiland
DATE	05/30/2013	06/03/2013	06/10/2013

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