

February 24, 2016

MEMORANDUM TO: David W. Alley, Chief
Component Performance, NDE, and Testing Branch
Division of Engineering
Office of Nuclear Reactor Regulation

FROM: Ali Rezai, Materials Engineer */RA/*
Component Performance, NDE, and Testing Branch
Division of Engineering
Office of Nuclear Reactor Regulation

SUBJECT: SUMMARY OF INDUSTRY / U.S. NUCLEAR REGULATORY
COMMISSION NONDESTRUCTIVE EXAMINATION
TECHNICAL INFORMATION EXCHANGE PUBLIC MEETING
(CAC NUMBER A11008)

On January 19-21, 2016, the U.S. Nuclear Regulatory Commission (NRC) staff hosted a Category 2 public meeting with industry representatives. The participants from industry included representatives from licensees, vendors, and the Electric Power Research Institute (EPRI) Nondestructive Examination (NDE) Center consisting of the NDE Integration Committee (IC) and the Performance Demonstration Initiative (PDI) program. Members of the public participated by teleconference. This meeting took place at the NRC Headquarters, Three White Flint North, 11601 Landsdown Street, North Bethesda, Maryland.

The purpose of this meeting was to facilitate an exchange of technical information about current and emerging NDE issues as well as to discuss lessons learned from the recent operating experience (OE). The meeting participants, agenda, list of action items, and presentations are provided in Enclosures 1, 2, 3, and 4, respectively.

The meeting commenced with a presentation titled "Action Item Review" which is provided in Enclosure 4, Item Number 1. The open action items are covered in detail in the presentations given by industry during this meeting and were closed.

Industry continues to interact with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) which involves technical information exchange that results in the development and the approval of new code cases, revisions to the previously approved code cases, and/or code changes. This presentation titled "NDE-Related Code Activities" is provided in Item Number 1 of Enclosure 4.

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In the presentation titled “Reactor Vessel Threads in Flange” in Item Number 1 of Enclosure 4, industry discussed a proposal to remove the requirement for inservice inspection (ISI) of the threads for the reactor pressure vessel (RPV) head stud holes which are located in the RPV flange. The basis includes (a) survey of OE over 30 years which shows no history of service induced degradation and (b) adverse impacts of the current Code requirement on personnel exposure, safety and the foreign material exclusion program. Industry is currently preparing a technical basis document that describes justifications for removal of RPV threads-in-flange inspections. This technical basis document could be used to initiate a Code change.

In the presentation titled “RPV Flange Ligament Inspections Coverage Limitations and Modelling” in Item Number 2 of Enclosure 4, the NRC staff discussed several relief requests that have recently been submitted to the NRC for limited examination coverage of the RPV flange ligaments between threaded stud holes. The regulations do not permit reduced coverage due to limitations caused by the tooling, only limitations caused by the configuration of the component. Furthermore, there exist no technical basis that the ultrasonic beam spread could increase examination coverage. The NRC staff has proposed that an inspection may be acceptable to the NRC if a mockup containing flaws (e.g., cracks or notches) is used to demonstrate that all flaws in the mockup can be detected and characterized. This may eliminate any need for relief request submitted by licensees.

Industry presented a status update of the piping and RPV procedure and personnel qualifications activities. This presentation titled “PDI Update” is provided in Enclosure 4, Item Number 1.

In the presentation titled “Adoption of Latest Procedure Versions (Action 2014-01-04)” in Item Number 1 of Enclosure 4, industry noted that the Nuclear Energy Institute (NEI) 03-08 Guidance “NDE 20151215-001” was issued on December 16, 2015. Under NEI 03-08 guidance, utilities shall have a process to ensure that the latest qualified revision of PDI generic procedures or EPRI Appendix VIII qualified ultrasonic testing (UT) procedures are used within one year of the procedure approval date. This presentation closes industry open action item “Action 2014-01-04.”

At the NRC staff’s request, industry presented statistical data on pass rate for Appendix VIII qualifications. This presentation titled “PDI Qualification Statistics Update” is provided in Enclosure 4, Item Number 1. PDI will continue to monitor pass rate for Appendix VIII qualifications and report pass rate statistics in the next meeting in January 2017. The NRC staff sought to understand the examiner’s false call rate and this has been identified as a new action item for future teleconference meetings.

In the presentations titled “IGSCC Qualification Program” and “Industry Perspective on IGSCC 3-Year Requalification Program” in Item Number 1 of Enclosure 4, industry presented a historical overview of (a) establishing requirements for the intergranular stress corrosion cracking (IGSCC) qualification and (b) creating the PDI implementation of Appendix VIII performance demonstration. Industry proposes to eliminate the IGSCC requalification program because Industry believes that occurrence of IGSCC has been reduced over the years, therefore, requalification no longer provides value. This discussion has been identified as a new action item for future teleconference meetings.

Industry presented status update on industry's extent of condition evaluation of Diablo Canyon missed flaw in weld overlay. This presentation titled "Diablo Canyon OE (Action 2014-07-03)" is provided in Enclosure 4, Item Number 1. This presentation closes industry open action item "Action 2014-07-03."

Industry provided an overview of the current and future NDE projects under the Materials Reliability Program (MRP) and the Boiler Water Reactor (BWR) Vessel Internal Program (VIP). These presentations titled "BWRVIP NDE Projects" and "Materials Reliability Program NDE Projects" are provided in Enclosure 4, Item Number 1.

Industry provided lists and brief descriptions of the industry's current and future NDE projects specifically related to reliability of NDE. This presentation titled "NDE Program Projects of Regulatory Interest" is provided in Enclosure 4, Item Number 1.

Industry presented a status update on industry's research activities under the current memorandum of understanding (MOU) between industry and the NRC. These presentations titled "Research under the MOU: Remote VT," "Research under the MOU: Cast Austenitic Stainless Steel," "Research under the MOU: HDPE," and "Research under the MOU: Modeling and Simulation" are provided in Enclosure 4, Item Number 1.

The NRC staff presented a status update on NDE research activities under the MOU signed between the NRC and EPRI. This presentation titled "Overview of NRC/EPRI NDE MOU" is provided in Enclosure 4, Item Number 7.

The NRC staff discussed limited examination coverage relief requests. At the close-out of every 10-year inservice inspection interval, licensees submit this type of request for the NRC approval under impracticality. The impracticality rule in Section 50.55a of Title 10 of *Code of Federal Regulation* (10 CFR) was not intended to be a multi-decade solution to be applied repeatedly to the same or similar welds. The NRC staff proposed that both industry and the NRC need to take actions to reduce these types of repetitive relief requests. The possible solutions could be Code change and NRC rulemaking. This presentation titled "Impracticality Relief Requests Based on Coverage" is provided in Enclosure 4, Item Number 3. This presentation closes NRC open action item "Action 2015-01-03."

The NRC staff presented a status update on the NDE of high density polyethylene (HDP) piping and round robin study. This presentation titled "Non-destructive Evaluation of Butt-Fusion Joint Integrity in High Density Polyethylene Piping" is provided in Enclosure 4, Item Number 8.

The NRC staff presented a status update on the program to assess reliability of emerging nondestructive techniques (PARENT). This presentation titled "Program to Assess the Reliability of Emerging Nondestructive Techniques" is provided in Enclosure 4, Item Number 5.

The NRC staff presented a status update on research to explore the effects of human factors issues on UT. This presentation titled "NRC Human Factors Research" is provided in Enclosure 4, Item Number 4.

The Pacific Northwest National Laboratory (PNNL), the NRC contactor, presented a status update and summary result of the NRC funded research projects. This presentation titled "Preliminary Flaw Response Comparison" is provided in Item Number 9 of Enclosure 4.

The NRC staff presented a status update on a study to determine the detection and characterization capability of phased array UT technique as compared to the conventional UT technique. This presentation titled "Comparing Conventional to Phased Array UT for Assessing Welding Fabrication Flaws" is provided in Item Number 6 of Enclosure 6.

The next three teleconferences are scheduled for Wednesday on April 13, July 13, and October 12, 2016.

Enclosures:

1. Attendance List
2. Meeting Agenda
3. List of Action Items
4. List of Presentations

The NRC staff presented status update on study to determine detection and characterization capability of phased array UT technique as compared to the conventional UT technique. This presentation titled "Comparing Conventional to Phased Array UT for Assessing Welding Fabrication Flaws" is provided in Item Number 6 of Enclosure 6.

The next three teleconferences are scheduled for Wednesday on April 13, July 13, and October 12, 2016.

Enclosures: Enclosures:

1. Attendance List
2. Meeting Agenda
3. List of Action Items
4. List of Presentations

DISTRIBUTION:

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ADAMS Accession Numbers:

Package: ML15352A176

Meeting Summary: ML16054A001

Meeting Notice: ML15351A467

Agenda: ML16019A493

ML16020A434: Industry Presentation Slides

ML16019A309: RPV Flange Ligament Inspections Coverage Limitations & Modeling

ML16019A311: Impractically Relief Requests Based on Coverage

ML16019A341: NRC Human Factors Research

ML16019A348: Program to Access the Reliability of Emerging Nondestructive Techniques

ML16019A384: Comparing Conventional to Phased Array UT for Assessing Welding Fabrication Flaws

ML16015A026: Overview of NRC/EPRI NDE MOU

ML16015A027: Non-Destructive Evaluation of Butt-Fusion Joint Integrity in High Density Polyethylene Piping

ML16021A084: Status Update of NDE Research at PNNLfor NRC

OFFICE	NRR/DE/EPNB	NRR/DE/EPNB
NAME	ARezai	DAlley
DATE	02/23/2016	02/24/2016

OFFICIAL RECORD COPY

ATTENDANCE

FOR INDUSTRY / U.S. NUCLEAR REGULATORY COMMISSION NONDESTRUCTIVE
EXAMINATION TECHNICAL INFORMATION EXCHANGE PUBLIC MEETING

NAME	ORGANIZATION
Kevin Hacker	Dominion
Gary Lofthus	SNC
Greg Selby	EPRI
Carl Latiolais	EPRI
David Anthony	Exelon
Tony Oliveri	PSEG
Dan Nowakowski	NextEra
Damon Priestley	TVA
Jack Spanner	EPRI
Leo Martin	Duke
Jeff Devers	LMT
Fred Hull	LMT
Lonnie Cochran	LMT
Phil Ashwin	EPRI
Aaron Diaz	PNNL
Dave Alley	USNRC
Robert Hardies	USNRC
Josh Kusnick	USNRC
Carol Nove	USNRC
Jay Collins	USNRC
Anthony Cinson	USNRC
Keith Hoffman	USNRC
Ali Rezai	USNRC
John Tsao	USNRC
Eric Reichelt	USNRC
Stephen Cumblidge	USNRC
Iouri Prokofiev	USNRC
Amy D'Agostino	USNRC
Rob Tregoning	USNRC
Andrew Yeshnik	USNRC
Nicholas McMurray	USNRC
Abhijit Sengupta	USNRC
Bruce Lin	USNRC
Chip Becker	USNRC

NAME	ORGANIZATION
MJ Ross-Lee	USNRC
Joel Jenkins	USNRC
Roger Kalikian	USNRC
Mike Briley	Entergy
Marjone Erickson	PEAI
Steven Swiley	EPRI
Paul Sullivan	Structural Integrity
Chris H. McKean	Excelon
Margaret Audrain	USNRC
John Lindberg	EPRI
Harry Smith	Excelon
Marc A Brooks	DTE – called in
Kathryn Brock	USNRC – called in
Alexander Butcavage	USNRC – called in
John Hayden	Structural Integrity – called in
Mr. Lewis	Member of public – called in

AGENDA

FOR INDUSTRY / U.S. NUCLEAR REGULATORY COMMISSION NONDESTRUCTIVE
EXAMINATION TECHNICAL INFORMATION EXCHANGE PUBLIC MEETING
NRC HEADQUARTERS, THREE WHITE FLINT NORTH, ROOM 1C03,
11601 LANDSDOWN STREET, NORTH BETHESDA, MARYLAND
JANUARY 19 – 21, 2016

Duration	Time	Topic	Topic (detail)	Presenter
Tuesday, January 19, 2016				
Opening items				
:30	1:00	Meeting opening	Attendance, announcements, action items, EPRI and advisory organizational update	Industry/ NRC Hardies Selby
Code				
:30	1:30	ASME Code Actions	Reviews of NDE-related Code actions	Industry Lofthus
:30	2:00	Reactor vessel threads in flange	Industry progress on feasibility of developing a technical basis to remove this requirement from Code	Industry Hacker
:20	2:30	Technical discussion on reactor vessel threads in flange examinations	Discuss tooling, demonstrations, beam spread, coverage	NRC Cumblidge
:20	2:50	Break		
:20	3:10	Examination coverage (<i>Action 2015-01-03</i>)	Discuss alternatives to the relief request process	NRC Cumblidge
PDI				
:30	3:30	PDI update	Update of PDI operational items	Industry Anthony
:20	4:00	Adoption of latest procedure versions (Closes Action 2014-01-04)	Provide status and discussion of industry guidance for adoption of the latest versions of generic procedures	Industry Hacker
:10	4:20	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC	NRC
	4:30	Adjourn		

Dura tion	Time	Topic	Topic (detail)	Presenter
Wednesday, January 20, 2016				
:30	8:00	PDI qualification statistics update (Closes Action 2014-10-02)	Statistics for personnel who have attempted the Appendix VIII qualification examinations and passed/failed over the past year Number of people who have Supplement 10 qualification, and how many of those individuals do not have IGSCC qualification	Industry Anthony
:45	8:30	IGSCC Qualification Program	Review of the history of the IGSCC Qualification Program requirements	Industry Latiolais
Reliability				
:30	9:15	NDE reliability improvements	Status of industry's broad NDE reliability recommendations document	Industry Hacker
:20	9:45	Diablo Canyon OE (Action 2014-07-03)	Review of the industry extent of condition activities from Diablo Canyon OE	Industry Hacker
:20	10:05	Break		
:10	10:25	BWRVIP NDE projects	Brief descriptions of NDE-related projects	Industry McKean
:10	10:35	MRP NDE projects	Brief descriptions of NDE-related projects	Industry Smith
:30	10:45	NDE Program projects	Brief descriptions of NDE-related projects	Industry Hacker
:30	11:15	PARENT project	Update on PARENT and successor projects	NRC Cumblidge
:05	11:45	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC	NRC
1:20	11:50	Lunch		
:10	1:10	Introduction to EPRI/RES MOU	High-level introduction to EPRI/RES joint research process under a Memorandum of Understanding (MOU)	NRC Nove
:30	1:20	Research under the MOU: Remote VT	Objectives, design and execution status of Phase 3 round robin	Industry Oliveri
:10	1:50	Research under the MOU: CASS	Research on examination capabilities for cast austenitic stainless steel (CASS), including status of round robin activity	Industry Hacker

Duration	Time	Topic	Topic (detail)	Presenter
:15	2:00	Research under the MOU: HDPE	NDE capability for high density polyethylene (HDPE) piping, including 2016 round robin opportunity	Industry Lofthus
:30	2:15	Research under the MOU: UT modeling and simulation	Research status and planning as stakeholders work toward agreement on modeling best practices	Industry Hacker
:30	2:45	Research under the MOU: Human factors	Research results, literature search; summary of the new MOU Attachment on human factors	NRC D'Agostino
:20	3:15	Break		
	Other			
:30	3:35	RPV upper head examinations	Discussion of recent experiences	NRC Cumblidge
:20	4:05	Open discussion		All
:05	4:25	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC	NRC
	4:30	Adjourn		
Thursday, January 21, 2016				
Broad NDE picture				
:30	8:30	NDE capability for HDPE piping	High density polyethylene piping NDE, including 2016 round robin opportunity	NRC Cinson
:30	9:00	Update on NDE Research at PNNL	Share NRC research progress	NRC Nove
:30	9:30	UT-RT Update	Comparing Conventional to Phased Array UT	NRC Nove
:20	10:00	Break		
:20	10:20	Open discussion	Further discussion of any items; looking ahead	Industry/ NRC
:15	10:40	Closing items	New action items, announcements, next meeting	Industry/ NRC
:05	10:55	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC	NRC
	11:00	Adjourn		

ACTION ITEMS

Open and New Actions

Action No.	Topic	Own by	Action Description	Date Open	Due
2014-01-07	Examiner population	Ind	Discuss false call rate data availability at next quarterly call	01/09/14	12/15/16
2016-01-01	Evaluation of 3-year requalification for IGSCC	Ind	Industry will explore alternatives to this practice that could more efficiently ensure that the proficiency of examiners is maintained. Progress will be discussed in the quarterly Industry/NRC coordination calls.	01/21/16	ongoing
2016-01-02	Identify regulatory interest in EPRI Workplan items	NRC	NRC to review EPRI NDE Program Workplan and identify, for each project, the level of regulatory interest (High, Medium, Low) and why. Provide to EPRI for use in developing next January's agenda.	01/21/16	07/13/16

LIST OF PRESENTATIONS

Package ML15352A176

1. ML16020A434 - Industry Presentations Slides
2. ML16019A309 - RPV Flange Ligament Inspections Coverage Limitations and Modeling
3. ML16019A311 - Impracticality Relief Requests Based on Coverage
4. ML16019A341 – NRC Human Factors Research
5. ML16019A348 - Program to Assess the Reliability of Emerging Nondestructive Techniques
6. ML16019A384 - Comparing Conventional to Phased Array UT for Assessing Welding Fabrication Flaws
7. ML16015A026 - Overview of NRC/EPRI NDE MOU
8. ML16015A027 - Non-Destructive Evaluation of Butt-Fusion Joint Integrity in High Density Polyethylene Piping
9. ML16021A084 - Status Update of NDE Research at PNNL for NRC
10. ML16019A493 - Agenda