

February 15, 2017

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/*  
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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 17-19, 2017, the U.S. Nuclear Regulatory Commission (NRC) staff hosted a Category 2 public meeting. The participants included the Electric Power Research Institute (EPRI) staff and industry representatives from licensees and vendor companies. Many of the licensees' representatives also hold advisory roles to the EPRI Nondestructive Examination (NDE) Program as members of the NDE Integration Committee (IC). In addition, 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 public 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 presentation titled "NDE-Related Code Activities" (Item No. 1 of Enclosure 4) provides an overview of industry's interaction with the American Society of Mechanical Engineers Boiler and Pressure Vessel Code (ASME Code) during 2016. These interactions involve NDE related technical information exchange that usually result in the development and the approval of new code cases, revisions to the previously approved code cases, and/or code changes. A notable code activity during 2016 is the approval of a new Code Case N-831 "Ultrasonic Examination in Lieu of Radiography for Welds in Ferritic Pipe" by the ASME Code in 2016. This code case gives an alternative option for licensees to utilize the ultrasonic testing (UT) method to volumetrically inspect the ferritic piping welds after repair/replacement activity in place of the radiographic testing (RT).

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Under Section III and Section XI of the ASME Code and the Construction Code, RT is the technique utilized when volumetric examinations of the welds are required after repair/replacement activities or construction. In the past years, EPRI and the NRC Office of Research (RES) under a memorandum of understanding (MOU) have pursued independent research to assess the capability, effectiveness, and reliability of UT as a replacement method for RT. The outcome of this research resulted in the development of a new Code Case N-831, which was approved by the ASME Code Standard Committee in October 2016. This presentation titled "UT in lieu of RT Update" is provided in Item No. 1 of Enclosure 4.

Since ASME Code Case N-831 has not yet been incorporated by reference into Title 10 of the *Code of Federal Regulation* (CFR) 50.55a by inclusion in Regulatory Guide (RG) 1.147, licensees asked the NRC staff for guidance on how to obtain the NRC's approval for use of this code case in their fleet. The NRC staff responded that licensees may choose to submit a plant-specific or a fleet-wide relief request proposing to use Code Case N-831 under a hardship or an unusual difficulty in accordance with 10 CFR 50.55a(z)(2). It is important to note that on a fleet-wide relief request, there should be sufficient similarity between how each plant in the fleet will use the request to justify the generic approach. This discussion has led to three new actions, one action for the NRC: (Action Item No. 2017-01-01) to consider to incorporate Code Case N-831 into regulatory process as early as possible; and two actions for industry: (Action Item No. 2017-01-02) to consider to develop a template for Code Case N-831 based relief requests, and (Action Item No. 2017-01-03) to ask the ASME during February 2017 Code Week to request the NRC to expedite the Code Case N-831 review and inclusion into RG 1.147. Progress report and follow-up discussions on these three action items will be continued in the future teleconference meetings.

The NRC staff presented an overview and status of the NDE research projects between the NRC RES and EPRI through MOU. This presentation titled "Overview of NRC/EPRI NDE MOU" is provided in Item No. 3 of Enclosure 4. The NRC staff described and highlighted the benefits of MOU which is a vehicle that allows and encourages cooperation between the regulators and EPRI in nuclear safety research. The outcomes of MOU benefit both the regulators and the nuclear industry in nuclear safety. Examples of ongoing and new MOUs include the UT modeling and simulation, CASS, UT in lieu of RT, and human performance influences on NDE reliability.

Industry presented an update on the status of the industry's efforts to remove the ASME Code requirement (Section XI, IWB-2500, Examination Category B-G-1) for inservice inspection (ISI) of the threads for the reactor pressure vessel (RPV) head stud holes which are located in the vessel flange. These efforts included the preparation of a technical basis documents (EPRI Report No. 3002007626, publicly available without fee) and the development of a new Code Case N-846. Code Case N-846 was approved by the ASME Code working group and subgroup levels, but not by Standards Committee. This presentation titled "RPV Threads in Flange Update" is provided in Item No. 1 of Enclosure 4.

Industry presented a status update of the piping and RPV procedures demonstration and personnel qualifications activities under the Performance Demonstration Initiative (PDI) Program. This presentation titled "PDI Program Status" is provided in Item No. 1 of Enclosure 4. PDI plans to review its program to assure compliance with the upcoming rulemaking that is incorporating by reference the 2013 Edition of Section XI to the ASME Code into 10 CFR 50.55a. PDI has revised and approved several of its generic procedures in 2016. It is important

to note that Nuclear Energy Institute (NEI) 03-08 "Needed Element" requires the latest qualified revision of the PDI generic procedures to be used by licensees and/or vendors within one year of the procedures approval date.

Industry presented statistical data on pass rate for Appendix VIII qualifications. This presentation titled "PDI Qualification Statistics Update" is provided in Item No. 1 of Enclosure 4. It is noted that monitoring pass rate for the Appendix VIII qualifications will be continued by PDI, and the pass rate statistics will be presented to the NRC staff in the future teleconference meetings (Open Action Item No. 2014-01-07).

In the presentation titled "IGSCC Requalification Project Update" in Item No. 1 of Enclosure 4, industry noted that the historical/literature search of requirements for the UT performance qualification and requalification for the intergranular stress corrosion cracking (IGSCC) were completed. The industry's findings under this activity are as follows: (a) no Code and/or regulatory requirements have been found mandating periodic IGSCC requalification and (b) the NRC staff's presentation dated January 8, 2014 (Accession No. ML14014A344), confirmed that the requalification pass rates for a skilled group of inspectors has not been very different than the initial qualification pass rates. Industry affirmed that as of January 2018, the industry's expectation for 3-year IGSCC requalification will cease. Maintaining examiner proficiency will be accomplished through implementation of the Appendix VII recertification process as well as industry's hands-on practice guideline. Industry plans to publish an EPRI technical report that documents background, technical basis and rationale for the UT performance qualification and requalification for IGSCC.

In the presentation titled "NRC Proposed Condition on Encoded Volumetric Examinations on Dissimilar Metal Butt Welds" in Item No. 2 of Enclosure 4, the NRC staff explained the new requirement for the Class 1 welds that will be in the upcoming 2013 rulemaking. Specifically, the rulemaking requires that the Class 1 dissimilar metal (DM) butt welds (i.e., Inspection Items A-1, A-2, B, E, F-2, J, and K in Table 1 of Code Case N-770-2 "Alternative Examination Requirements and Acceptance Standards for Class 1 PWR Piping and Vessel Nozzle Butt Welds Fabricated with UNS N06082 or UNS W86182 Weld Filler Material with or without Application of Listed Mitigation Activities Section XI, Division 1) be volumetrically examined by an encoded UT method. This requirement shall be implemented 30 days after the publication of the final rule (expected to be published in the Federal Registry in spring/summer 2017). The NRC staff noted that:

- a. Within 6 months of the final rule's implementation period, if a licensee has determined that there exists a hardship or an unusual difficulty to comply with the requirement during its current refueling outage, it may request an extension from the NRC for one refueling outage for un-cracked DM butt welds. The request for extension should be submitted in accordance with 10 CFR 50.55a(z)(2). The submittal should also propose to perform the VT-2 visual examinations during periodic walkdowns.

For cracked DM butt welds, the NRC staff will consider a request for an extension for one refueling outage under a hardship or an unusual difficulty in accordance with 10 CFR 50.55a(z)(2) on a case by case basis. The submittal should also propose to perform the VT-2 visual examinations during periodic walkdowns.

- b. For DM butt welds with physical limitations, the NRC staff will consider a request for alternative under a hardship or an unusual difficulty in accordance with 10 CFR 50.55a(z)(2). The request should contain:
- Consistent technical basis for missed inspection coverage
  - Best effort encoding examinations
  - Scan maps showing areas of missed encoding

The submittal should also propose to perform the VT-2 visual examinations during periodic walkdowns.

- c. Request under impracticality in accordance with 10 CFR 50.55a(g)(5)(iii) and 10 CFR 50.55a(g)(6)(i) cannot be used in any of the above (i.e., a and b) for this requirement.

In the presentation titled “Status of Industry’s NDE Reliability Activities” in Item No. 1 of Enclosure 4, industry explained the key steps that have been taken during 2016 to improve the reliability of NDE activities. It is noted that EPRI plans to integrate into its UT inspectors’ training program a Virtual NDE Simulator. This Virtual NDE simply simulates the conditions and functions of ultrasonic scanning, and allows users without access to physical ultrasonic instruments or pipe specimens to identify and locate flaws in virtual pipe specimens using techniques similar to those used with the physical instruments on actual specimens. The NRC staff acknowledged that the industry’s initiatives in improving the NDE reliability (e.g., detecting service-related defects in a timely and reliable manner) is vital for assurance of structural integrity of plant components and public safety.

In support of the “Nuclear Promise,” the industry discussed NDE examinations that are considered to have low value (i.e., due to the history of few or no relevant indications being identified) with high outage impact (e.g., due to personnel safety and radiation dose concerns). This presentation titled “Low Value Examinations with High Outage Impact” is provided in Item No. 1 of Enclosure 4.

Industry provided an update on current accomplishments and planned NDE projects under the Materials Reliability Program (MRP) and the Boiler Water Reactor (BWR) Vessel Internal Program (VIP). These presentations titled “BWRVIP NDE Update” and “Materials Reliability Program NDE Projects” are provided in Item No. 1 of Enclosure 4.

In the presentation titled “NDE Program Projects of Regulatory Interest” in Item No. 1 of Enclosure 4, EPRI described its current and future research projects. EPRI’s research focus area includes but is not limited to: improving NDE reliability, NDE workforce proficiency, materials degradation and characterization, NDE of CASS, NDE performance demonstration, Virtual NDE Simulator, NDE efficiency (e.g., UT in lieu of RT), NDE strategic long-term projects (e.g., SMART sensors, flexible - paint-on sensors for ultrasonics), NDE of underground piping and tanks, NDE of concrete, and NDE of fuels and dry storage.

At the NRC staff’s request, industry presented updates on implementation of industry’s thermal fatigue guidance (i.e., MRP-146 “Management of Thermal Fatigue in Normally Stagnant Non-Isolable Reactor Coolant System Branch Lines” and EPRI interim guidance MRP 2015-019 “Implementation of NEI 03-08 Needed and Good Practice Interim Guidance Requirements for Management of Thermal Fatigue”) and addressing recent OE on thermal fatigue cracks

appearing in new areas. This presentation titled “Thermal Fatigue UT Examination Guidance” is provided in Item No. 1 of Enclosure 4. To respond to the recent OE, Inspection Technical Advisory Committee (TAC) plans to revise the thermal fatigue examination procedure, which includes developing thermal fatigue UT guidance to use with generic procedure PDI UT-2, fabricating additional thermal fatigue mockups, and adding the mockups into EPRI’s Virtual NDE UT Simulator.

In the presentation titled “Thermal Fatigue” in Item 4 of Enclosure 4, the NRC staff acknowledged the industry’s active efforts in addressing cracking due to thermal fatigue degradation mechanism. Since 1980s, industry has developed several guidance to manage thermal fatigue cracking (e.g., through evaluation and identification of potential areas, inspection, and periodic re-examination). Recent OE has indicated that thermal fatigue is the cause of cracking, and leakage, in new areas. In the subsequent 10-year ISI interval, leakage has occurred on several welds that had limited examination coverage (impracticality relief request), and the cracking has linked to thermal fatigue. Under MRP-146, inspection of pipe base material (far from a weld) is required, but not under the ASME Code requirement. The NRC staff suggests to include a similar requirement as in MRP-146 into the ASME Code for examination of the pipe base material (far from a weld). The NRC staff also suggests to include a guidance for performing high quality “Best Effort” examinations of the unexamined volume (unachievable coverage) of the welds. Discussions on examination coverage as well as reduction in relief request submittals under impracticality for limited coverage on welds of lower safety significance led to a new action for the NRC: (Action Item No. 2017-01-05) to define the issues and resolutions, and communicate it to industry for discussion during future teleconference meetings.

The Pacific Northwest National Laboratory (PNNL) (the NRC contractor) and EPRI presented status update on the remote visual testing (VT) research which includes a round robin study under an MOU between the NRC RES and EPRI. The PNNL’s presentation titled “Assessment of Reliability of Remote Visual Testing” is provided in Item No. 8 of Enclosure 4 and the EPRI’s presentation titled “Remote VT Round Robin” is provided in Item No. 1 of Enclosure 4.

PNNL and EPRI presented status update on the cast austenitic stainless steel (CASS) research which includes the round robin study, developing technical basis for a performance demonstration (i.e., procedure demonstration and personnel qualification) of CASS piping UT, and drafting Supplement 9 for Appendix VIII (Section XI to the ASME Code). PNNL’s presentation titled “Status Update of NDE Research at PNNL – CASS/DMW Examination Reliability” is provided in Item No. 9 of Enclosure 4 and EPRI’s presentation titled “Cast Austenitic Stainless Steel (CASS) Update” is provided in Item No. 1 of Enclosure 4. This discussion led to a new action for the NRC: (Action Item No. 2017-01-04) to evaluate regulatory aspects of CASS performance demonstration, and discuss during future teleconference meetings.

Industry discussed its high density polyethylene (HDPE) research. This presentation titled “HDPE Research Update” is provided in Item No. 1 of Enclosure 4. EPRI has published several technical reports that are publicly available without fee, which include: EPRI Technical Report No. 3002005434 “Advanced Nuclear Technology (ANT): Literature Review of Mechanical Testing Methods to Evaluate the Integrity of HDPE Butt-Fusion Joints” published in September

2016 and EPRI Technical Report No. 3002008761 “ANT High-Density Polyethylene Flaw Development, Sample Fabrication, and Performance Demonstration” published in December 2016.

PNNL presented a status update and a summary of results of the NRC funded research projects on HDPE NDE. This presentation titled “Evaluation of Ultrasonic Phased-Array for Detection of Planar Flaws in High-Density Polyethylene Butt-Fusion Joints” is provided in Item No. 11 of Enclosure 4.

PNNL and EPRI presented a status update on their research study related to UT modeling and simulation that could replace or augment physical development and testing. It is envisioned that this independent research by the NRC RES and EPRI under an MOU would lead to the development of a consensus framework under which modeling could be standardized. PNNL’s presentation titled “Status Update of NDE Research at PNNL – Modeling & Simulation” is provided in Item No. 10 of Enclosure 4 and EPRI’s presentation titled “Ultrasonic Modeling and Simulation Research Update” is provided in Item No. 1 of Enclosure 4.

The NRC RES staff and EPRI provided update on research related to impact of human factors on the UT reliability. The NRC’s presentation titled “Exploring the Effects of Human Factors Issues on Ultrasonic Non-Destructive Examination” is in Item No. 10 of Enclosure 4 and EPRI’s presentation titled “Human Factors in NDE Research Overview: Literature and OE Review, On-site Observations” is in Item No. 1 of Enclosure 4. The goal of this research is to identify, characterize, and quantify the human factors that influence an inspector’s performance in the field inspections as compared to its performance during the qualification process in a controlled laboratory environment.

At the NRC staff’s request, industry discussed its initiatives to address the design for inspectability in the new plants. This presentation titled “Design for Inspectability” is provided in Item No. 1 of Enclosure 4.

The NRC staff and industry discussed the bare metal visual examination (VE) of RPV upper head penetration nozzles. The NRC’s presentation titled “Recent Issues with VE of Upper-Head Nozzles” is provided in Item No. 6 of Enclosure 4 and the industry’s presentation titled “Reactor Vessel Upper Head Bare Metal Visual Examination” is provided in Item No. 1 of Enclosure 4. The NRC staff noted that there have been two instances where licensees had issues performing bare metal VE of RPV upper head penetration nozzles in accordance with ASME Code Case N-729-1 “Alternative Examination Requirements for PWR Reactor Vessel Upper Heads With Nozzles Having Pressure-Retaining Partial - Penetration Welds, Section XI, Division 1” as mandated by 10 CFR 50.55a(g)(6)(ii)(D) with conditions. The NRC staff identified the following lessons learned from these two instances:

- a. Identification of “relevant conditions of possible nozzle leakage” for the bare metal VE under Code Case N-729-1 was not well understood by licensees and their contractors;
- b. Appropriate cleaning techniques were not used to confirm that there was an absence of “relevant conditions of possible nozzle leakage.”

The NRC staff noted that EPRI Report No. 1007842 "Visual Examination for Leakage of PWR Reactor Head Penetrations," an industry document that is publicly available without fee, provides some useful guidelines for evaluating relevant conditions to determine the source of boric acid on the RPV upper head. The NRC staff also noted that:

- i. If a RPV upper head penetration nozzle has tightly-adhering boric acid deposits after light cleaning, then the NRC staff consider this a "relevant indication of possible nozzle leakage;"
- ii. A streamer or trail of boric acid, from above a tightly adhering boric acid deposit in the annulus between the head and nozzle, only identifies a potential source for an indication of a relevant boric acid deposit, it does not preclude that the boric acid deposit could have come from possible nozzle leakage;
- iii. Power-washing the RPV upper head prior to evaluating the possible boric acid deposits in the annulus between the head and nozzle to determine if they are tightly adhering makes it very challenging to prove the source of the leakage in accordance with the bare metal VE requirements of ASME Code Case N-770-1 as mandated by 10 CFR 50.55a(g)(6)(ii)(D), with conditions.

This discussion led to a new action for the NRC: (Action Item No. 2017-01-06) to consider issuing a Regulatory Issue Summary to communicate this issue to utilities, and discuss progress during future teleconference meetings.

A member of the public commented that any indication of potential leakage needs to be evaluated to ensure of component structural integrity. The NRC staff assured that any relevant indication shall be evaluated and disposed in accordance with appropriate ASME Code requirements and the regulation.

The next three teleconferences in 2017 are scheduled for Wednesday April 5, Tuesday July 11, and Wednesday October 4.

Enclosures:

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

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

Date: February 15, 2017

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<b>DATE</b>	02/15/2017	02/15/2017

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ATTENDANCE

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

<b>NAME</b>	<b>ORGANIZATION</b>
Kevin Hacker	Dominion
Gary Lofthus	SNC
David Anthony	Exelon
Tony Oliveri	PSEG
Dan Nowakowski	NextEra
Damon Priestley	TVA
Leo Martin	Duke
Fred Hull	LMT-Curtiss Wright
Joel Harrison	System One
Ray Stack	Dominion
R. Chris Wray	Dominion
John O'Neil	Exelon
David Zimmerman	Areva
Michael Lashley	Structural Integrity
Chris H. McKean	Exelon
Dave Alley	USNRC
Carol Nove	USNRC
Jay Collins	USNRC
David Rudland	USNRC
Keith Hoffman	USNRC
Ali Rezai	USNRC
John Tsao	USNRC
Stephen Cumblidge	USNRC
Iouri Prokofiev	USNRC
Amy D'Agostino	USNRC
Rob Tregoning	USNRC
Robert Davis	USNRC – called-in
Bruce Lin	USNRC
MJ Ross-Lee	USNRC
Joel Jenkins	USNRC
Roger Kalikian	USNRC
Raj Iyengar	USNRC
Marvin Lewis	Member of the public – called in
Sara Obadina	USNRC

<b>NAME</b>	<b>ORGANIZATION</b>
Pradeep Ramuhalli	PNNL
Susan Crawford	PNNL
Arron Diaz	PNNL
John Lindberg	EPRI
Mark Dennis	EPRI
Myles Dunlap	EPRI
John Lindberg	EPRI
Anthony Cinson	EPRI – called-in
Jack Spanner	EPRI
Greg Selby	EPRI
Carl Latiolais	EPRI
Brian Thomas,	USNRC
David Dijamco	USNRC
Seung Min	USNRC
Pat Purtscher	USNRC
Jeff Poehler	USNRC
Ganesh Cheruvenki	USNRC

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 17 – 19, 2017

<b>Time</b>	<b>Topic</b>	<b>Topic (Detail)</b>	<b>Presenter</b>
<b>Tuesday, January 17, 2017</b>			
<b>Opening items</b>			
1:00	Meeting opening	Attendance, announcements, action items, EPRI <sup>1</sup> and NRC <sup>1</sup> organizational updates	NRC Alley Industry Selby
<b>Code</b>			
1:30	NDE <sup>1</sup> -related ASME <sup>1</sup> Code activities	Review of 2016 NDE <sup>1</sup> -related Code activities	Industry Lofthus
2:00	RPV <sup>1</sup> threads in flange	Industry progress on developing a technical basis to remove this requirement from Code	Industry Hacker
2:30	UT <sup>1</sup> in lieu of RT <sup>1</sup>	Update on Industry efforts enabling the use of UT <sup>1</sup> instead of RT <sup>1</sup> for various applications	Industry Hacker
2:50	<b>Break</b>		
<b>PDI<sup>1</sup></b>			
3:10	PDI <sup>1</sup> update	Update of PDI <sup>1</sup> operational items	Industry Anthony
3:30	PDI <sup>1</sup> qualification statistics update	PDI <sup>1</sup> Program statistics update since last meeting	Industry Anthony
3:50	IGSCC <sup>1</sup> requalification	Update on Industry IGSCC <sup>1</sup> requalification activities	Industry Hacker
4:30	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC <sup>1</sup>	NRC Alley
4:40	<b>Adjourn</b>		

Time	Topic	Topic (Detail)	Presenter
<b>Wednesday, January 18, 2017</b>			
<b>Reliability</b>			
8:00	Proposed rulemaking on Class 1 DM <sup>1</sup> welds	The proposed 2013 Rulemaking (which has already been gone thru public comments) contains a condition for the encoded inspection of all Class 1 DM <sup>1</sup> welds. How may Industry/NRC <sup>1</sup> handle potential relief requests?	Joint discussion Industry Hacker NRC Collins
8:45	Industry activities for NDE <sup>1</sup> reliability improvement	Status of Industry's activities for NDE <sup>1</sup> reliability improvement	Industry Hacker
9:00	Low Value / High Impact NDE <sup>1</sup> applications	Update on Industry Low Value / High Impact NDE <sup>1</sup> Examination Project	Industry Hacker
<b>Research overviews</b>			
9:25	BWRVIP <sup>1</sup> NDE <sup>1</sup> projects	Brief descriptions of NDE <sup>1</sup> -related projects	Industry McKean
9:40	MRP <sup>1</sup> NDE <sup>1</sup> projects	Brief descriptions of NDE <sup>1</sup> -related projects	Industry Nowakowski
10:00	<b>Break</b>		
10:20	NDE <sup>1</sup> Program projects	Brief descriptions of NDE <sup>1</sup> -related projects	Industry Hacker
11:05	Thermal fatigue UT <sup>1</sup> examination guidance	NRC <sup>1</sup> : provide background on regulatory interest. Industry: Update on implementation of MRP <sup>1</sup> -146 and EPRI <sup>1</sup> interim guidance MRP <sup>1</sup> 2015-025 regarding thermal fatigue examinations and how limited coverage is addressed	NRC Cumblidge Industry Nowakowski
11:45	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC <sup>1</sup>	NRC Alley
11:50	<b>Lunch</b>		
1:00	Introduction to EPRI/RES <sup>1</sup> MOU <sup>1</sup>	High-level introduction to EPRI/RES <sup>1</sup> joint research process under a MOU <sup>1</sup>	NRC Nove
1:10	Update on Remote VT <sup>1</sup> Round Robin	Objectives, design and execution status of Phase 3 round robin	NRC Nove Industry Oliveri

<b>Time</b>	<b>Topic</b>	<b>Topic (Detail)</b>	<b>Presenter</b>
2:20	CASS <sup>1</sup> research (part 1)	Research on examination capabilities for CASS <sup>1</sup> and the development of Appendix VIII, Supplement 9 technical basis	NRC Nove Industry Hacker
3:00	<b>Break</b>		
3:20	CASS <sup>1</sup> research (continued)	Research on examination capabilities for CASS <sup>1</sup> and the development of Appendix VIII, Supplement 9 Technical Basis	NRC Nove Industry Hacker
3:50	HDPE <sup>1</sup> research	NDE <sup>1</sup> capability for HDPE <sup>1</sup> piping, including 2016 round robin opportunity	NRC Nove Industry Lofthus
4:40	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC <sup>1</sup>	NRC Alley
4:50	<b>Adjourn</b>		
<b>Thursday, January 19, 2017</b>			
<b>Broad NDE picture</b>			
8:00	UT <sup>1</sup> modeling and simulation	Research status and planning as stakeholders work toward agreement on modeling best practices	NRC Nove Industry Hacker
8:40	Human factors research	Research results, literature search; summary of the new MOU <sup>1</sup> Attachment on human factors	NRC D'Agostino Industry Hacker
9:20	Design for inspectability overview	Emergent hot topic within ASME <sup>1</sup> Code, NRC <sup>1</sup> and Industry is the design for inspectability issue with AP1000 <sup>1</sup> . A new ASME <sup>1</sup> Code Task Group has been formed to address the issue. The issue brings in many items of NDE <sup>1</sup> research included single sided austenitic examination qualification, CASS <sup>1</sup> examination, limited examination coverage, and possibly risk-informed ISI <sup>1</sup> . Brief update with discussion to follow.	Industry Lofthus
9:50	<b>Break</b>		
10:10	RV <sup>1</sup> upper head bare metal visual examination	Discuss examination requirements and experience with addressing relevant conditions	NRC Cumblidge Industry Hacker

<b>Time</b>	<b>Topic</b>	<b>Topic (Detail)</b>	<b>Presenter</b>
10:40	Rulemakings in the works	Discuss timeline for adoption of ASME <sup>1</sup> 2009-2013; also reprise NRC <sup>1</sup> presentation at Code August 2016.	NRC Cumblidge
11:20	Open discussion	Further discussion of any items; looking ahead	Industry/ NRC
11:40	Closing items	New action items, announcements, next meeting	Industry/ NRC
11:55	Public comments	Opportunity for members of the public to make comments and to ask questions of the NRC <sup>1</sup>	NRC Alley
12:00	<b>Adjourn</b>		

Acronym<sup>1</sup>

EPRI – Electric Power Research Institute  
NRC – U.S. Nuclear Regulatory Commission  
ASME – American Society of Mechanical Engineers  
RPV – Reactor Pressure Vessel  
RV – Reactor Vessel  
UT – Ultrasonic Testing  
RT – Radiographic Testing  
PDI – Performance Demonstration Initiative  
IGSCC – Intergranular Stress Corrosion Cracking  
DM – Dissimilar Metal  
BWRVIP – Boiler Water Reactor Vessel and Internals Project  
MRP – Materials Reliability Program  
RES – NRC: Office of Nuclear Regulatory Research  
MOU – Memorandum of Understanding  
VT – Visual Examination  
CASS – Cast Austenitic Stainless Steel  
HDPE – High Density Polyethylene  
AP1000 – Advanced Passive 1000  
ISI – Inservice Inspection

ACTION ITEMS  
Open / New

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	2Q2017 call
2017-01-01	Code Case N-831	NRC	Incorporate N-831 into regulatory process as soon as possible. Report progress on quarterly calls.	01/19/17	12/31/17
2017-01-02	Code Case N-831	Ind	Develop a template for N-831 based relief requests. Report progress on quarterly calls.	01/19/17	03/31/17
2017-01-03	Code Case N-831	Ind	Ask ASME to request NRC to expedite N-831	01/19/17	Feb 2017 Code Week
2017-01-04	CASS timeline	NRC	Evaluate regulatory aspects (i.e., Will the stated 2020 put regulator and licensees into a position from which they can't recover?) Request additional public comments. Report progress on quarterly calls.	01/19/17	12/31/17
2017-01-05	Limited examination coverage	NRC	Consider how to reduce the number of relief requests for coverage on welds of lower safety significance (i.e., NRC to define the problem, prepare an outline of all the 'essential variables' that bear on the issue, and communicate it to industry for discussion). This may lead to follow-on actions to develop an approach. Report progress on quarterly calls.	01/19/17	3Q2017 call
2017-01-06	RPV upper head bare metal visual	NRC	Pursue a Regulatory Issue Summary (RIS) communicating the issues with N-729-1 implementation. Report progress on quarterly calls.	01/19/17	No due date.

## LIST OF PRESENTATIONS

Package ML17041A083

1. ML17017A311 – Industry: Presentations Slides
2. ML17018A438 – NRC: Proposed Condition on Encoded Volumetric Examinations on Dissimilar Metal Butt Welds
3. ML17017A388 – NRC: Overview of NRC/EPRI NDE MOU
4. ML17013A656 – NRC: Thermal Fatigue
5. ML17013A618 – NRC: Exploring the Effects of Human Factors Issues on Ultrasonic Non-destructive Examination
6. ML17013A657 – NRC: Recent Issues with VE of Upper-Head Nozzles ML16015A026 – Overview of NRC/EPRI NDE MOU
7. ML16222A002 – NRC: Proposed Rule to Incorporate by Reference the 2015 Editions of ASME Codes into 10 CFR 50.55a
8. ML17013A620 – PNNL: Assessment of Reliability of Remote Visual Testing
9. ML17013A628 – PNNL: Status Update of NDE Research at PNNL –CASS/DMW Examination Reliability
10. ML17013A633 – PNNL: Status Update of NDE Research at PNNL –Modeling & Simulation
11. ML17017A142 – PNNL: Evaluation of Ultrasonic Phased-Array for Detection of Planar Flaws in High-Density Polyethylene Butt-Fusion Joints
12. ML17011A273 - Agenda

ENCLOSURE 4