

Conte, Richard

- Tim O'Shea
- Ed Miller /
- Lepold - D?, - Tsa

From: Conte, Richard *RT*
Sent: Friday, April 16, 2010 9:55 AM
To: Ashley, Donnie; Balian, Harry; Brown, Michael; Burritt, Arthur; Chernoff, Harold; Gardocki, Stanley; Hardies, Robert; Hoffman, Keith; Holston, William; Lupold, Timothy; Modes, Michael; OHara, Timothy; Pelton, David; Robinson, Jay; Sanders, Carleen; Schroeder, Daniel; Thorp, John
Cc: Wilson, Peter
Subject: Degraded AFW piping. FW: Conference Details (APR 16, 2010--01:30 PM ET--Conf# 7379947)
Attachments: SL1 AFW Degradation Coating Failure Rev1.doc

Although time is for 130 to 330, the call starts at 200pm.

888-790-1159
Participant passcode: (b)(2)

See attached problem summary and open issues listed as a guide for discussion.

Would also like to talk about Containment Unit 2 and Unit 2 liner blistering

-----Original Message-----

From: confirmations@mymeetings.com [mailto:confirmations@mymeetings.com]
Sent: Friday, April 16, 2010 9:39 AM
To: Conte, Richard
Subject: Conference Details (APR 16, 2010--01:30 PM ET--Conf# 7379947)

Your conference details are enclosed.

Meeting Information:

Leader: MR RICHARD CONTE
Phone number: 1-610-337-5183
Contact: MR TROY MCNAIR
Phone number: 1-301-415-7026

Call date: APR-16-2010 (Friday)
Call time: 01:30 PM EASTERN TIME
Duration: 2 hr
Service level: Unattended
Number of lines: Total=12 Dialout=0 Meet Me=12 Meet Me Toll=0

Confirmation number: 7379947
Company: FTS-NUCLEAR REGULATORY COMMISI
CRC:

Passcodes/Pin codes:

Information in this record was prepared in accordance with the Freedom of Information Act.
Exemptions: 2
FOIAPA 2010-0334

D-47

Participant passcode:

(b)(2)

✓

For security reasons, the passcode will be required to join the call.

Dial in numbers:

Country Toll Numbers Freephone/Toll Free Number

USA

~~888-790-1159~~ ✓

Restrictions may exist when accessing freephone/toll free numbers using a mobile telephone.

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- 1) Press *0 operator assistance (small fee may apply).
 - 2) Press *6 mute/unmute individual line.
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Selected Conference Features:

Audio

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Past Opn

MFR SWP
FEA

Len Rajkovic

Revision 2 - 4/19/10

No 14

in P.T

No. 12

Welded completed

ANE NDE

Hydro Test < Coating

3031 ins. sup.

60 ft impossible UT

AWR-OP Cycle

Problem Summary:

As a result of implementation the PSEG buried pipe program, significant degradation of the No. 14 and 12 Auxiliary Feedwater Piping was identified - certain section may need to be replaced based on minimum wall analysis. PSEG is developing a past and future operability review along with a finite element analysis in order to assess the structural integrity of the AFW piping including a potential design change for minimum wall thickness based on a new pressure rating. An apparent cause is little to no coating application of this section of buried piping. An extent of condition is being developed as a part of a root cause report that will not be finalized until after the pending startup of Salem 1 ~4/24/10. Unit 2 is operating and has similar piping but the difference appears to be in the use of a proper coating application based on 1994 information.

Open Issues:

FHB

93 ft

Pressure

1. Staff needs to understand if PSEG is asserting that the AFW piping buried in the FHB is coated and unblemished (wetted sand conditions). Is this a code compliant in light of as found conditions?

~~FHB~~

2. It appears that PSEG intent is to repair a certain section, rely on an FEA for other remaining but degraded conditions, coat the pipe and then do a hydro. Is this code compliant if not looking for actual leaks in degraded section?

Trench

3. Analysis for reduced design pressure from 1950 to 1275 psi?

min 185

4. Adequacy of FEA - due in Monday April 19?

Pressure Rating Curve

5. Adequacy of past and future operability determinations?

Pressure Rating Curve

6. Is the extent of conditions story on U2 AFW piping adequate?

(design records)

7. Is the extent of condition story on control air extent of condition adequate, SW different type of material in SW?

Control Air
Service to

main region of vessel

409
ins. 282 weld

Oper Dist
Cyclotron

Background/Facts:

See attached for more details. The licensee has dug a trench along about one quarter of the southwest wall of the Unit 1 containment between the fuel handling building and the containment outer penetration building. Based on flow path, the AFW piping exits the fuel handling building and enters the outer penetration room to enter containment and feed the No. 14 and 12 Steam Generators. The piping also traverses in the fuel handling building under the fuel transfer canal from the mechanical penetration room and is surrounded by sand fill.

In the trench, PSEG is characterizing the level of degradation of the No. 14 and 12 headers based on UT information that is ASME code compliant. The licensee is also characterizing the level of degradation of piping in the fuel handling building - sand was removing exposing a portion of the AFW piping and other lines having service air and control air which also traverse the above noted trench.

Safety Significance:

[IG structural integrity]

starting point
[260 min]

337

AFW is safety related. AFW is also relied upon for normal startup and shutdown. In addition it is used to mitigate all internal initiating events with the exception of large and medium break LOCA's. AFW is also utilized to mitigate external initiators, such as fire and flooding

If the system is capable of performing it's safety function, there is no safety significance. The licensee continues to assess the structural integrity of as-found conditions.

Licensee Next Steps:

Repair:

The licensee is still investigating the level of degradation in the yard/trench area and in the area below grade in the fuel handling building.

Based on UT measurement they need to determine extent of repair based on revised analysis for minimum wall thickness based on a new design pressure rating. They are tentatively looking at replacing 50 feet of pipe below minimum wall of .260 inches (not clear yet reduced rated pressure) without additional UT characterization. The remaining piping will have the 1 inch by 1 inch grid characterization. Where the pipes enter the outer penetration room and the FHB in this trench, the penetrations are also in need of repair.

Some repair/coating or reapplication of coating in the FHB will be needed. They are apparently relying on intact coating on vertical section of the riser in the FHB and assuming uniform condition for the buried section in the building. A hydrostatic post repair test is to include this section of piping. This area may be a significant challenge since it is an area of wetted sand and the coating can not have any imperfections with respect to above noted assumptions.

Output Analysis:

Operability to support startup of Unit 1

Operability determination to support past operations for Unit 1.

Finite Element Analysis on ASME qualified UT information (doing a 1inch by 1 inch template review similar to that done for flow accelerated corrosion measurements.

Root Cause and extent of condition review – final documentation after startup.

Potential design change package for reduced pressure rating of system from 1950 to 1275 psi.

Extent of Conditions:

Unit 1 other headers No. 11 and 13 as well as corresponding headers in Unit 2 – Not buried, no evidence of a problem.

Unit 2 buried headers: 1994 data and records suggestion acceptable coating; and where damage occurred due to digging, it was repaired.

B. Coates

Other Safety Related Piping - Control Air – with one exception in the fuel handling building, the condition of coating was acceptable and appears to have been properly applied. Repair to the exception in the fuel handling building will be made, apparent due to isolated mechanical damage.

Other Safety Related Piping – Service Water Nuclear Headers – different material, concrete inner and outer coating surrounding carbon steel

Notification to State of New Jersey: Inspector was onsite observing conditions as they occurred.

NRC Staff Next Steps:

The Region added an extra week to the ISI inspection in order for the inspector to continue to follow developments.

We continue to interface internal stakeholders on a periodic basis.

An IMC 309 review was being considered. Entry conditions have not been met due to lack of evidence related to structural integrity AFW.

A review of OpE had been started – other buried pipe AFW problems have been identified back to 2000 – draft IN has been in the works since Oyster Creek issue last year.

No inquiries to date from External stakeholders.

Industry Outreach:

PSEG is interfacing with INPO OpE.

Public Outreach:

None to date

Attachment 1 – Factual Development

Week of 4/5/10:

Two of four AFW lines are buried on each Salem Unit. On Unit 1, approximately 150' of piping between the pumps in the Auxiliary building to SG #12 and to SG #14 are buried. Only the buried portions are in question here because they are inaccessible for inspection per the Code. The remainder of the non-buried piping in the AFW system is included in the ISI Program and is inspected via code qualified UT. The 150' is an estimate from several prints and several of the PSEG engineers - 2 runs of 4", schedule 80, carbon steel pipe of about 150' each - total of about 300'.

Licensee was using guided wave technology for initial characterization and need to dig additional pits – turned out they needed to dig the whole area up. The inspector explained agency position that the ASME code does not recognize the Guided Wave readings and they cannot be credited for dimensions as part of a repair. The ISI Program Manager acknowledges this and understands the concern.

Engineers have alluded to visual inspections conducted in 1998 which said the coating was in good shape - however that have not been able to present those reports. Those inspections should be documented or they did not occur.

Regarding the min wall situation, not all of the limited Code UT are below calculated min wall of 0.278" (nominal is .337") for a rated pressure of 1950 psi.

PSEG had ordered replacement pipe.

Week of 4/12/10:

Update - Salem Unit 1 Outage – AFW (headers 12 and 14) buried piping Issues

Based on UT results from the shallow section of the Unit 1 buried AFW piping for headers 12 and 14 (headers 11 and 13 are not buried), the licensee currently plans to replace a combined total of approximately 50' of piping on the shallow buried portion of these two headers (depth of approx 4 ft). The licensee is using a contractor to perform a finite element analysis to confirm the structural integrity of the rest of the shallow piping. These results will then be used to finalize the licensee's determination of past operability for the shallow piping and to identify the need for additional corrective actions related to any extent of condition on the operating unit, Unit 2.

To this point the licensee has confirmed reasonable assurance of operability for the Unit 2 AFW system based on historical information and photographs from 1994 that provided indication of intact pipe coating and the fact that Unit 2 is about 2 years younger than Unit 1.

The operability evaluation for the shallow section of piping that will be based on the finite element analysis is expected to be completed by Monday, 4/19.

On the deep section of piping for headers 12 and 14, the licensee has excavated a small portion of the down comer that leads to the deeper piping. They performed ultrasonic testing (UT) around the elbow at the top of this down comer (depth of approx 4 ft), which was completely submerged in groundwater. The minimum wall thickness measured in this area was ~0.226",

which was greater than the minimum required wall thickness of 0.200". In addition the licensee performed a guided wave pipe inspection on a portion of the straight run of the deep section of piping (approximately 20 ft in length at a depth of approx. 17 ft). The results indicated less wall thinning on this section of piping than the guided wave results indicated for the shallow section of piping. The licensee has also confirmed that the deep section of AFW piping was coated similar to the shallow section of piping.

Based on the results of the UT around the elbow and the results of the guided wave in the 20 ft section of deep piping, the licensee plans no further excavation of the deep section of piping. The licensee's current plans are to recoat all of the piping exposed during excavation that will not be replaced, in both the shallow and deep sections, and then following the completion of pipe replacements for the significantly degraded exposed pipe sections, hydro the entire line, both the shallow and deep sections. The licensee will use these hydro results to support operability of the deep section of piping for the next operating cycle.

To facilitate completion of the operability determinations for both the shallow and deep section of piping, the licensee will also be reducing the design pressure of the AFW piping from a very conservative 1900 psig down to a more realistic 1275 psig through a plant modification package.

Example picture



U2 vs U1 Cont. Line Blisters - Mark Barmer

Tim Field

clouds

- Class U1 Bene med

.500

[1st square	447	- 500	.430
		Upper 400		
	0031 yr.			

U1

- 3 other corr. Bar
min corr. no blister

4. amst. last
4.40 only

U2 - ~~from~~ Roberts

- Below change 3/4 section 350
above cloud

- Picta top Bar - D, 2m

- Picta 4.14? Blister Bar

Tim & Barmer

Robert Taylor

Robert Barmer
Blisters below
D, 2m