

OHara, Timothy

From: OHara, Timothy *RI*
Sent: Saturday, April 10, 2010 8:57 AM
To: Modes, Michael; Conte, Richard
Subject: RE: AF Piping update

Mike,

Thanks for the insights. This will give me some avenues to pursue. I'll be back in touch soon.

Tim OHara

-----Original Message----- *RI*
From: Modes, Michael
Sent: Saturday, April 10, 2010 5:06 AM
To: OHara, Timothy; Conte, Richard
Subject: RE: AF Piping update

I am going to loose contact with you guys starting Sunday afternoon (no internet until Wednesday evening).

They are clearly planning to use it as-is. His summary indicates they are going to dig up all the pipe, perform a profile by UT thickness measurement, subject it to FEA with some future wear. Here is the first rub ... how do you know the rate of degradation? I assume they are going to try a linear argument. We knew what it was when we put it in the ground, we know what it is now, and the rate of degradation is thus. Not so ... the rate of degradation is very slow to break down the coating and then very fast to corrode the pipe itself. There is nothing linear about this based on my recollection of the ground chemistry. You remember they ran a test loop on their system prior to choosing the material for the piping change they implemented in the plant in the late 90s. Some of the loop samples run on their system failed in a matter of months. That is how corrosive this stuff is.

Don't forget ... this is an artificial island built on the tidal marsh of the Delaware river. The ocean salt line regularly comes up this far in the river at high tide and during drought conditions the salt line threatens the fresh water intakes of the Camden water system up river. The plants are actually giant concrete boats that float on the mud. The sit on piles that never reach the bedrock.

A future wear seems to indicate they are not going to re-wrap the pipe before putting it underground again. That is okay because the rate of corrosion tends to slow down once you have thick oxide coating developed (rust) because it slows the migration of cations.

Of course we would want to review, in detail, the FEA assumptions they use. Anyone involved in OC remembers the pain these can create. I wonder how quickly we can get Sandia lined up to run a benchmark model. Maybe if we threaten this approach it will give PSEG pause. They would realize that we may come back after-the-fact and seriously question the acceptance of the as-is condition based on our independent FEA. Worth the effort don't you think?

As for the rest of the email. I figured they couldn't redesign the entire system for above ground in that short a time. Heck, you have to missile shield, heat trace, and insulate the whole thing, while designing for all the loads.

From: OHara, Timothy *RI*
Sent: Friday, April 09, 2010 6:27 PM
To: Modes, Michael; Conte, Richard
Subject: FW: AF Piping update

Mike & Rich,

As usually happens, PSEG seems to be changing their approach on the pipe replacement. Today they told us that there were too many unknowns to proceed with an above ground redesign.

They are now going to excavate all of the present piping and UT it. They have engaged SIA to perform an FEA of the system, I believe as a prelude to telling us that they can continue to operate the present system. The attached file is what they are giving SIA as input to the FEA.

The email below from Len Rajkowski gives their new (today) Code approach. I'm going to need some help from someone on whether this is feasible and whether 10 CFR 50.55a accepts this.

Another concern is that they will, in all likelihood not be able to UT everything and will then attempt to use Guided Wave to determine wall thickness.

Mike, I'd like your opinion on what this sounds like and some guidance on who in NRR should review this approach.

Tim OHara

From: Schroeder, Daniel L. [mailto:Daniel.Schroeder@pseg.com]
Sent: Friday, April 09, 2010 12:09 PM
To: OHara, Timothy
Subject: FW: AF Piping update

From: Rajkowski, Leonard J.
Sent: Friday, April 09, 2010 10:46 AM
To: Schroeder, Daniel L.
Cc: Eilola Jr, Edwin; Fricker, Carl J.; Mattingly, William F.; Barnes, James M.
Subject: AF Piping update

Dan,

Today, 4/9/10, PSEG commences the complete excavation of AF buried piping between the FHB and the Outer Pen. We are also planning to excavate inside the Fuel Transfer Area. This will allow for a more complete UT of the affected piping, while also preparing for a possible replacement in-kind or modified buried arrangement.

A finite element model is being developed, incorporating the irregular pipe section profile defined by the given ultrasonic thickness measurements (and adjusted for the defined future wear). The given pressure and axial loading will be applied to this model such that the resultant primary membrane and bending stresses in the pipe cross-section may be computed for design analysis.

ASME Code Section III Design Analysis

As allowed in ASME Section III ND-3611.3 (2004 Edition, latest approved by the NRC), a more rigorous piping design analysis such as NB-3200 may be used to calculate stresses required to satisfy ND-3 600 requirements. Note that the calculated stresses must be compared to the allowable stresses in ND-3 600. Thus to show acceptance of the degraded piping with a non-uniform pipe wall, the design loadings will be determined using design by analysis methods in NB-3200 (see Task 2). Current ASME Code allowable stresses based on a factor of 3.5 on tensile strength will be used.

Qualifications: Structural Integrity (SI) will perform this work in accordance with the SI QA Program, which is in compliance with the requirements of 10CFR50, Appendix B, 10CFR21, and ANSI/ASME NQA-1-1989, 1994 and meets the intent of applicable portions of ANSIN45.2. The SI implementation of the QA Program has been audited and accepted by many nuclear utilities and clients. SI's Quality Assurance Program is controlled by SI's Quality Assurance Manual Revision 6, dated 12/20/2006 and is implemented in accordance with the applicable SI Quality Procedures.

Any questions, please call me,

Leonard J Rajkowski
Engineering Director
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(856) 339-5142

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