From: DR WILLIAM CORCORAN
Sent: Wednesday, June 08, 2016 7:36 PM
To: Paul; Lew, David <David.Lew@nrc.gov>; Dentel, Glenn <Glenn.Dentel@nrc.gov>; Dorman, Dan <Dan.Dorman@nrc.gov>; Haagensen, Brian <Brian.Haagensen@nrc.gov>; Trapp, James <James.Trapp@nrc.gov>
Cc: Paul Gallay <pgallay@riverkeeper.org>; Amy Rosmarin; Susan Van Dolsen; Andrew Bast; Roger Witherspoon; marilyn elie; Aaron Cantu; Sam Thielman; Nancy Cutler; Sheehan, Neil <Neil.Sheehan@nrc.gov>; Pickett, Douglas <Douglas.Pickett@nrc.gov>; Burritt, Arthur <Arthur.Burritt@nrc.gov>; Dacimo; Jk Canepa; Ellen Weininger; Ellen Cantarow ; Alison Rose Levy; Sandra Galef <galefs@assembly.state.ny.us>; Ellen Cantarow; John Sullivan; Kathryn Miles; Elizabeth Browning Studio; Elijah Shaheen
Subject: [External_Sender] Re: UCS bolt assessment of operability

How would the reactor have responded to any and all design basis events, including loss of coolant accidents (LOCAs) and Steam Line Breaks (SLBs), if one had occurred just before the plant shutdown for the core former inspection?

How will the NRC develop lines of inquiry?

How will Entergy develop lines of inquiry?

What are the failure modes? Did all of the failed bolts fail the same way?

What are the results of the metallographic examinations and tests? Were they all the same?

What is the time distribution of the failures?

What are the conditions, behaviors, actions, and inactions that resulted in the failures not being manifested before 2016?

What was the technical safety basis for the inspection intervals?

Were there any alarms from the Metal Impact Monitoring System (MIMS)?

Were there any abnormal conditions that could be seen on any instrumentation and/or recordings?

What are the results of a careful inventory accounting of all of the bolts, bolt pieces, bolt fragments, fasteners, etc. to nail down exactly what foreign material is going to be still inside the reactor coolant system?

(Even temporarily trapped material can be freed by mechanical, hydraulic, or other perturbations/ shocks to the system, in which case the foreign material can damage important equipment including steam generator tubes and fuel cladding.)

Did the Metal Impact Monitoring System (MIMS) detect any of the pieces from broken bolts?
If so, how did workers evaluate the quite valuable advice it provided?
If not, should it have detected the impacts from the metal pieces?

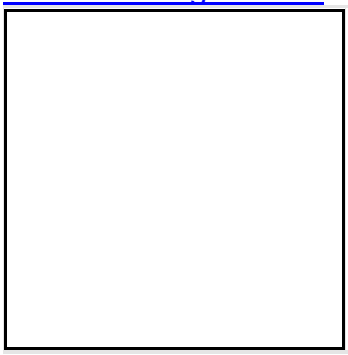
What are the other U.S. reactors that have bolts and similar fasteners inside the reactor coolant pressure boundary?

What were the circumstances of the “over 8700” bolts Areva said it has replaced? How many other bolts have been replaced? What were the circumstances?

What are the other questions and lines of inquiry?

The Areva infomercial is at
https://youtu.be/fR-lVJUcbtY
It says that Areva has replaced over 8700 bolts.

The NRC Information Notice 98-11 is at
NRC: Information Notice No. 98-11: Cracking of Reactor Vessel Internal Baffle Former Bolts in Foreign Plants



NRC: Information Notice No. 98-11: Cracking of Reactor V...

The Nuclear Regulatory Commission, protecting people and the environment.

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Take care,

Bill Corcoran

William R. Corcoran, Ph.D., P.E.

On Wednesday, June 8, 2016 12:24 PM, Paul wrote:

From: Dave Lochbaum <DLochbaum@ucsusa.org>
Date: June 8, 2016 at 11:32:41 AM EDT
To: "Blanch, Paul"
Subject: Indian Point Unit 3

Hello Paul:

I've had a chance to read Entergy's licensee event report on the degraded baffle bolts on Unit 2 as well as NRC Inspection Manual Chapter 0326 (attached and hereafter referred to as MC 0326).

Entergy described the LER as covering "Unanalyzed Condition due to Degraded Reactor Baffle-Former Bolts" (cover page).

Entergy stated that the degraded baffle bolts did not meet the acceptable criteria in WCAP-18048-P to allow Unit 2 to restart - "The consequence of this is that baffle-former bolt replacements were required to be completed prior to returning IP2 back to service" (page 2, middle paragraphs).

Entergy stated that "The root cause of the baffle-former bolt failures is primarily Irradiation Assisted Stress Corrosion Cracking..." (page 3) and that "Failure of a critical number of bolts in a localized area subsequently increased loading on adjacent bolts thus increasing the probability of failure of the adjacent bolts and generating the clustered pattern seen in the inspection results" (page 3).

Entergy committed to "Perform inspection of the baffle-former bolts in refueling outage 2R23" (page 4). MRP-227-A only requires re-inspections every 10 years (every fifth refueling outage), so Entergy is inspecting the Unit 2 bolts on an accelerated schedule due to the extent of the degradation.

MC 0326 Section 04.05 states that "Circumstances that require an operability determination: a. Degraded conditions. b. Nonconforming conditions. c. Discovery of an unanalyzed condition." As noted above, Entergy's LER reported that an unanalyzed condition had been discovered; namely, the degraded condition of the baffle bolts which was nonconforming to the acceptance criteria in WCAP-18048-P. Any one factor would require an Operability Determination -- having all three present just makes the right call easier.

MC 0326 Section 04.04 defines the scope of operability determinations. That scope should include "The SSCs (systems, structures, and components) affected by the degraded or nonconforming condition" and "The extent of condition for all similarly affected SSCs." Based on past practice, these criteria mean that, for example, a degraded condition found on a 2-inch valve must be assumed to affect 1-inch, 3-inch, and other sized valves if the cause of the

degradation is unrelated to the 2-inch size. Similarly then, the degraded condition on Unit 2 SSCs should invoke an Operability Determination evaluating this potential degraded condition on Unit 3's SSCs.

MC 0326 Section 04.03 outlines the Presumption of Operability. It's akin to the presumption of innocence in trials. The first full paragraph on page 7 explains the limitations on the Presumption of Operability - "...it would not be appropriate to presume operability based on the future results of an analysis where there is not a reasonable expectation that the system can perform its specified safety function during the interim." Entergy's report indicated that Unit 2 could not be safely restarted until the degraded bolts were replaced. Until it is established that Unit 3's bolts are not degraded (either by an Operability Determination or by shut down to inspect the bolts), there's not a reasonable expectation that the core former's safety function can be performed.

Entergy's LER and NRC's MC 0326 provide me the documentation I needed to contend that Unit 3 should either be shut down for baffle bolt inspections or have its continued operation sans inspections justified by a formal Operability Determination reviewed by the NRC.

Thanks,
Dave Lochbaum
UCS