



**UNITED STATES
NUCLEAR REGULATORY COMMISSION**
REGION III
2443 WARRENVILLE RD. SUITE 210
LISLE, IL 60532-4352

March 21, 2014

LICENSEE: FirstEnergy Nuclear Generation, LLC
FACILITY: Davis-Besse Nuclear Power Station
SUBJECT: SUMMARY OF THE FEBRUARY 20, 2014, WEBINAR TO DISCUSS NRC INSPECTION ACTIVITIES ASSOCIATED WITH THE DAVIS-BESSE NUCLEAR POWER STATION INSTALLATION OF TWO NEW STEAM GENERATORS

On February 20, 2014, the U.S. Nuclear Regulatory Commission (NRC) held a Webinar to discuss the NRC inspection activities associated with the Davis-Besse Nuclear Power Station installation of two new steam generators and to provide an opportunity for interested parties to ask questions of the presenters. The NRC and meeting notice for this Webinar can be found in the Agencywide Documents Access and Management System (ADAMS) as ML14030A553. The presentation that was shown during the Webinar can also be found in ADAMS as ML14050A400.

The Webinar consisted of the NRC giving a short presentation and then responding to questions from interested parties sent in via the Webinar software. The audio recording of the session, which includes the recording of questions that were answered, is in ADAMS as ML14066A044. Enclosed are answers to in-scope questions that were not addressed during the Webinar. NRC participants in the Webinar are listed in the Webinar Meeting notice.

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Branch 4
Division of Reactor Projects

Docket No. 50-346
License No. NPF-3

Enclosure:
Unanswered In-Scope Questions for the NRC
Meeting on February 20, 2014

cc w/encl: Distribution via ListServ™

Reply to Unanswered In-Scope Questions for the NRC Meeting February 20, 2014

Introduction: On February 20, 2014, the U.S. Nuclear Regulatory Commission (NRC) conducted a Webinar to discuss NRC activities associated with FirstEnergy Nuclear Operating Company's Davis-Besse Nuclear Power Station steam generator replacement activities. The outage to replace the steam generators started on February 1, 2014.

Records indicated that 76 people registered for the Webinar but only 45 people signed in for the Webinar and listened to all or part of the Webinar. Sixteen of those 45 submitted questions. The majority of those 16 submitted multiple questions. Some of the submitted questions appeared outside of the scope of the Webinar and were not considered for answering either during the Webinar or with the answers provided below for in-scope questions that time did not permit answering during the Webinar.

Many of the previously unanswered questions had similar elements. Below questions with what appeared to have similar elements were grouped together and one answer provided in which we attempted to address the major points asked.

NOTE: in many of the below answers appears an ADAMS Accession Number identified by the starting letters of "ML". Using that number to search for records in the NRC's Publicly Available Records System (PARS) component of NRC's Agencywide Documents Access and Management System (ADAMS), the actual document referenced can be viewed. ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

The PDF Audio File of the Webinar is available in ADAMS with an Accession Number of ML14066A044 and can be accessed to listen to answers to questions addressed during the Webinar.

Questions and Answers

Steam Generator

- Q:** Please review sequence of Refueling and Steam Generator replacement regarding opening of Shield Building and Steel Shell 2ndary containment? [Michael Keegan] [mkeeganj@comcast.net]
- Q:** Please provide a listing of all differences between the OSG and the RSG which include manufactures, the tube material, size, number, length, and all support that are inside the RSG.[Don Leichtling] [captddd@gmail.com]
- Q:** Since Alloy 690 has a lower heat transfer properties how many new tubes have been added to maintain the same heat generation? [Don Leichtling] [captddd@gmail.com]**Q:** How have you bounded for 'shafing' of tubes with the Inconel 690? How will you inspect for this going forward? [Michael Keegan] [mkeeganj@comcast.net]

Answer

At a Public Meeting on March 20, 2013, FirstEnergy Nuclear Operating Company (FENOC) discussed with the NRC their planned Davis-Besse Steam Generator Project. To facilitate that discussion, FENOC made a presentation (ADAMS Accession Number ML13078A249) that addressed many elements of the project and also addressed many of the questions sent in for the February 20, 2014, Webinar.

Specifically, that presentation has slides showing:

- (slide pages numbered 54 through 56) the general site implementation including the sequencing of containment vessel and shield building opening and closing.
- (pages 9 through 12) the replacement steam generator design and comparison to the original steam generators including the number of steam generator tubes.
- (pages 15 and 16) the Technical Specifications (TS) changes to address the NRC required programs to monitor the condition of steam generator tubing.

The licensee TS change request (ML13018A350) as of March 6, 2014, is still being reviewed by the NRC; however, nothing in the change request, if approved, would negate the licensee's responsibility to have a viable steam generator tube monitoring program.

In slide page 16, FENOC refers to TSTF-501, "Revision to Steam Generator Program Inspection Frequencies and Tube Sample Selection." This document is available in ADAMS as Accession Number ML110610350.

50.59

Q: How can NRC allow FirstEnergy to perform a "like-for-like" steam generator replacement at Davis-Besse, when the new steam generators are significantly different than the old steam generators. Arnie Gundersen, Chief Engineer, Fairewinds Associates, Inc., expert witness for the environmental coalition challenging the Davis-Besse steam generator replacements before the NRC's Atomic Safety and Licensing Board (ASLB), has identified and documented the following nine significant changes from the old steam generators to the replacement steam generators:

- 1.) The tube inspection lane was removed;
- 2.) An additional tube support plate was added;
- 3.) 150 additional tubes were added;
- 4.) The tube alloy was changed;
- 5.) The tube-to-tube sheet junction was modified extensively;
- 6.) The overall design of the steam generator support structure was changed from a cylindrical skirt to a pedestal cone;
- 7.) The thickness of the pressure retaining walls of the ROTSG [Replacement Once Through Steam Generator] is two inches thinner than the pressure retaining wall in the Original Once Through Steam Generator;
- 8.) The 180 degree elbow design will be extensively modified;
- 9.) The alloy of the hot leg nozzles was also changed. As Gundersen has asserted, any one of these significant changes should have triggered a license amendment proceeding, as requested by the coalition of environmental interveners. [Kevin Kamps] [kevin@beyonduclear.org]

Q: All those differences between the OSGs and the RSGs, but no license amendment? [Ace Hoffman] [rhoffman@animatedsoftware.com]

Q: Given that San Onofre 2 & 3, CA, were permanently shutdown after a dangerously botched steam generator replacement, causing a multi-billion dollar boondoggle, how can NRC now allow FENOC to install replacement steam generators at Davis-Besse that are significantly different than the old ones they are replacing? Why hasn't NRC conducted a careful review of the changes' safety significance? How can NRC allow FENOC to conduct an un-reviewed experiment with new steam generators, risking catastrophic releases of hazardous radioactivity to the environment (cascading failure of steam generators tubes, Loss of Coolant Accident, reactor core meltdown, containment breach), and/or a financial meltdown? [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

FENOC made a presentation (ADAMS Accession Number ML13078A249) that addressed many elements of the project and also addressed many of the questions sent in for the February 20, 2014, Webinar. Specifically, for the above questions, that presentation has slides (pages 9 through 12) showing the replacement steam generator design and comparison to the original steam generators. Also, on slide page number 31, FENOC mentions NRC regulation 10 CFR 50.59, "Changes, tests, and experiments." That regulation specifies that licensees may make changes to the facility under certain conditions and specifies the conditions under which the changes can be made without a license amendment. FENOC has proposed that the changes they are making to the Davis-Besse Nuclear Power Station are consistent with the requirements of 10 CFR 50.59 and a license amendment is not required although certain changes in TS have been requested (ML13018A350) to support operation of the new steam generators.

The NRC is currently (as of March 13, 2014) conducting an inspection of the Davis-Besse Steam Generator Replacement Project using NRC Inspection Manual Inspection Procedure 50001, "Steam Generator Replacement Inspection" (ML11206B197). That procedure requires, in part, that inspectors:

"Verify that selected design changes and modifications to systems, structures, and components (SSCs) described in the Final Safety Analysis Report (FSAR) are reviewed in accordance with 10 CFR 50.59. Use procedure IP71111.17 as guidance."

"Review key design aspects and modifications for the replacement SGs and other modifications associated with SG replacement utilizing IP71111.17 as guidance. Where applicable, include design reviews for the provision of a temporary containment opening."

Inspection Procedure 71111.17, "Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications" (ML101340791), addresses reviewing 10 CFR 50.59 evaluations performed by a licensee. The final results of the currently ongoing inspection will be documented in a publicly available inspection report.

The NRC review of the FENOC Steam Generator Replacement project is consistent with NRC's Mission to license and regulate the nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.

Petition

- Q:** Why did NRC Staff oppose the environmental coalition's intervention challenging the Davis Besse steam generator replacements? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Why did NRC Staff oppose the environmental coalition's intervention against Davis-Besse's steam generator replacement, and argue against expert witness Arnie Gundersen of Fairewinds Associate's testimony warning about risks associated with NRC not carefully reviewing the nine significant changes to the new steam generators identified and documented by expert witness Gundersen? Why is NRC not supporting and requiring full license amendment proceedings, as requested by the environmental coalition? [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

FENOC, on January 18, 2013, filed a license amendment request (ML13018A350) to revise Davis-Besse TS to address in operation the characteristics of the replacement steam generators. FENOC stated that "... the proposed changes . . . would impose monitoring, inspection, repair, and reporting requirements to ensure SG tube integrity is maintained consistent with the Davis-Besse Nuclear Power Station accident analysis assumptions and regulatory requirements..." On May 20, 2013, and May 29, 2013, several petitioners requested a hearing on the requested changes and requested to be participants in such a hearing. The NRC, on June 14, 2013, (ML13165A351) asked the assembled Atomic and Safety Licensing Board (ALSB) to deny the request because the petitioners did not demonstrate standing to intervene. On August 12, 2013, the ALSB denied the petitioners request for a hearing (ML1324A110) because "the petitioners have failed to submit an admissible contention."

The NRC is currently (as of March 13, 2014) conducting an inspection of the Davis-Besse steam generator replacement project using NRC Inspection Manual Inspection Procedure 50001, "Steam Generator Replacement Inspection" (ML11206B197). That procedure requires, in part, that inspectors:

"Verify that selected design changes and modifications to systems, structures, and components (SSCs) described in the Final Safety Analysis Report (FSAR) are reviewed in accordance with 10 CFR 50.59. Use procedure IP71111.17 as guidance."

"Review key design aspects and modifications for the replacement SGs and other modifications associated with SG replacement utilizing IP71111.17 as guidance. Where applicable, include design reviews for the provision of a temporary containment opening."

Inspection Procedure 71111.17, "Evaluations of Changes, Tests, and Experiments and Permanent Plant Modifications" (ML101340791), addresses reviewing 10 CFR 50.59 evaluations performed by a licensee. The final results of the currently ongoing inspection will be documented in a publicly available inspection report.

The NRC inspection of the FENOC Steam Generator Replacement project at Davis-Besse is consistent with NRC's Mission to license and regulate the nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment.

Shield Building

- Q:** The Blizzard of '78, as you know, was blamed for the laminar cracks in 2011. Even though the shield building finally got weather proofing applied om 2012 - something that was supposed to have been done when the plant went online in 1977 - is the NRC doing an ultrasound investigation for other weather-related cracks, especially given how harsh this winter has been: -50 degree wind chills sustained by Polar Vortex, etc. Shouldn't the entire integrity of the structure be investigated? [Tom Henry] [thentry@theblade.com]
- Q:** Has thre ever been any testing to verify the integrity of concrete seals? It would seem that the seal would be a weakness in the building. The difference in the crack or void....with the age etc. of the concrete would make a weak point prone to breaking under pressure. Can you therefore TEST a seal before the plant opens? How?? [Kathryn Barnes] [greenwoodsart@msn.com]
- Q:** Has any other reactor containment been breached four times, as it has at Davis Besse?[Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Why don't you have information about the 2002 cut? It was a high-pressure water cut Wouldn't that be relevant from an engineering standpoint? [Tom Henry] [thentry@theblade.com]
- Q:** I see some of the opening in the shield bldg will be opened for the 3rd time, What is the sq footage of the area being cut for the 3rd time? [Ace Hoffman] [rhoffman@animatedsoftware.com]
- Q:** Why did NRC allow FENOC to breach its Shield Building twice – first for the 2011 reactor head replacement, and again for the 2014 steam generator replacement – instead of just once for both replacement jobs, as FENOC originally planned? How can NRC allow such multiple breaches, given the likely damage it is doing to the Shield Building each time? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Davis-Besse has breached its Shield Building four times: 1) in the 1970s for the Initial Construction Opening; 2) in 2002-2004 for the 1st vessel head replacement; 3) in 2011 for the 2nd vessel head replacement; and 4) now for the current steam generator replacement project. Hasn't this 4th breach risked even worse cracking of the already severely cracked Shield Building? How can NRC Staff approve extending Davis-Besse's 20-year license extension, given the risks of Shield Building cracking to fail the test of containment, as during a steam generator cascading tube failure, reactor core meltdown, causing a catastrophic release of hazardous radioactivity? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** I know there are two separate structures - the inner vessel and the outer building. My question was if and why the outer building was named the shield building. I'm told it was called the containment building for years and the language was used after the terrorist

attacks of Sept. 11, 2001 to shift attention away from potential meltdowns. Can you address that? Is that a euphemism the NRC is working with the industry to promote and, if so, why? As you know, there is disagreement over the ability of it to withstand a direct jetliner attack and FSARs have been pulled, post 9-11, regarding what it can withstand. [Tom Henry] [thentry@theblade.com]

Q: What is causing the cracking at Davis Besse? Earthquakes? Aging or what??[Kathryn Barnes] [greenwoodsart@msn.com]

Q: Why did the NRC agree to postpone follow-up core bore inspections of the shield building and allow the SG replacement to proceed when it was known that an expanded core bore inspection would be required? NRC allowed this project to continue without knowing the true condition of the shield building or knowing if cutting the wall would further damage the building. Why the blind step forward? [Victoria Clemons] [vclemons@roadrunner.com]

Answer

On October 10, 2011, during shield building hydro-demolition operations to create an opening to replace the reactor pressure vessel head, indications of potential cracks were identified in various sections of the opening in the reinforced concrete shield building. The licensee immediately informed the NRC. Through additional extent of condition activities, the licensee determined that laminar cracking running next to and parallel to the outer rebar mat existed in the shield building flute shoulders, around the main steam line penetrations, and in various locations near the top of the building wall. (See slide numbers 13 through 18 of FENOC's presentation during a public meeting addressing shield building cracking – ADAMS Accession Number ML1200050146.)

The containment system was designed to provide protection for the public from radiological consequences of hypothetical accidents including a break of the largest reactor coolant piping. The containment system consists of a concrete shield building, a steel containment vessel, and a void space/annulus area between the two structures. The containment vessel is made of 1.5 inch thick welded steel and sits inside the shield building separated by about 4.5 feet of void space (the annulus). The containment vessel (CV) provides the primary means to contain the post-accident environment and was designed to withstand and hold against accident pressure. The identified cracking did not involve the CV. The design basis of the shield building provided: (1) environmental protection of the containment vessel; (2) for a controlled release of the annulus atmosphere during accidents; and (3) shielding from radiation sources within the shield building. Specifically, the shield building's function was to provide biological shielding and, in the case of radioactive vapor leakage escaping from the CV during accident conditions, to allow the Emergency Ventilation System to draw a suction from the annulus region and filter that leakage. In addition, the shield building protects the CV from external environmental hazards such as tornado winds and tornado driven missiles. The shield building must also function to withstand earthquakes.

After extensive review by NRC Region III and NRC Headquarter structural experts, and additional resulting efforts by the licensee's staff with respect to extent of condition and technical evaluation, the NRC concluded that the licensee had provided sufficient rationale to demonstrate that the shield building remained capable of performing its safety function despite the cracking NRC Inspection Report (IR) 05000346/2012007 (ML12128A443). In order to

provide continued long-term confidence, the NRC issued Confirmatory Action Letter 3-11-001 (ML11336A355) on December 2, 2011, prior to plant restart to document licensee commitments to provide a root cause analysis and corrective actions, a long term monitoring plan, and specific short term monitoring efforts to ensure the cracking doesn't get worse in the interim. Related NRC conclusions and their bases were discussed during a public meeting held on January 5, 2012 (ML12030A141 and ML12004A010).

The licensee submitted its Root Cause Report (ML120600056) on the public docket on February 27, 2012. The licensee identified the direct cause as the integrated effect of moisture content, wind speed, temperature, and duration from the blizzard of 1978, and the root cause as the design specification for construction of the shield building not specifying application of an exterior sealant from moisture. The licensee also identified three contributing causes involving specific design features of the building. The Root Cause Report also identified planned corrective actions as well as associated due dates, and acknowledged that the shield building, although operable, did not conform to the licensing basis in its current condition.

The NRC completed its inspection of the licensee's root cause efforts and planned corrective actions on May 9, 2012, IR 05000346/2012009, (ML12173A023). The NRC inspection team concluded that the licensee had a sufficient basis for the causes of the shield building laminar cracking related to the environmental factors associated with the 1978 blizzard, the lack of an exterior moisture barrier, and the structural design elements of the shield building. Specifically, the weather records, core boring sample results, impulse response testing and shield building analytical modeling provided a sufficient basis to support the causes of the laminar cracking. The team identified minor weaknesses in the Root Cause Analysis Report associated with the level of detail in the documentation provided. These weaknesses did not constitute performance deficiencies or findings because they did not adversely affect the outcome of the root cause process. The team identified two examples for which the corrective actions to address the causes of the shield building cracking appeared too narrow. Specifically, the licensee had not proposed examinations to confirm a lack of subsurface cracking in other safety-related building structures with installed moisture barriers to further substantiate the Direct Cause. In addition, the corrective action for the Root Cause included updating a site procedure for inspections of only the shield building exterior sealant system instead of a broader action to inspect all safety-related buildings with moisture barriers. The licensee entered the team's observations into the corrective action system, and was considering actions to expand the scope of these corrective actions.

The licensee submitted a revised Root Cause Report (ML12142A053) on May 16, 2012, with changes to address the minor weaknesses identified during in the NRC inspection. The NRC developed a follow-up inspection plan focused on verification and evaluation of licensee corrective action implementation. NRC subsequent actions associated with review of the shield building are documented in IR 05000346/2012003 (ML12212A077) and IR 05000346/2012004 (ML13308A283). Initial conclusions were not changed.

On August 26, 2013, as part of the long-term monitoring of the shield building laminar cracking condition as prescribed by procedure, the licensee was performing boroscope inspections of core bores and identified cracks that were not documented previously. The licensee was using a new boroscope that has better resolution and articulation than the one used in previous years. These previously unidentified cracks have widths of 0.005 inches or less, save for one. Some of the previously unidentified cracks coincide with indications observed on the extracted cores

while some do not. NRC review of the newly identified cracking is documented in IR 05000346/2013004 (ML13308A283). At the conclusion of the inspection interval, the NRC concluded that the licensee had provided reasonable assurance that the shield building remained capable of performing all of its required design basis functions; however, the NRC planned to continue to monitor the licensee's ongoing core bore visual examinations and the licensee's subsequent analyses and corrective actions.

Shield Building Inspection

- Q:** FENOC's Jennifer Young has stated this week in the media that this most recent gap or air space in the Davis-Besse Shield Building wall was not detectable before the breach to replace the steam generators was revealed by visual examination. But why hadn't FENOC performed, and why didn't NRC require, other tests (such as X-rays, ultra-sonics, etc.) that could have easily revealed the gap or air space before now, after full-power operations with a 40% through-wall gap in the Shield Building? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Why did NRC not require that suitable alternative inspection methods (such as x-rays, ultrasonic tests, acoustic tests, etc.) were utilized to compensate for FENOC's departure from standard industry practice when it employed a technique, during the late 2011 re sealing of the Shield Building wall breach, that prevented normal post-concrete-pour examination and inspection methods (such as visual examinations). Why were such methods not required by NRC, as they could have detected the gap much earlier than the visual discovery made during the current steam generator replacement Shield Building cut through? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** How much concrete and steel rebar was determined to be necessary for the late 2011 repair job? Did the actual amounts used differ from the estimates? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Which companies, besides FENOC, including contractors and sub-contractors, etc., were responsible for making the repairs to the Shield Building following the October 2011 reactor head replacement breach? Who screwed up? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** What was the method to pour concrete and install rebar used to re-seal the Shield Building breach in 2011? Is the same method to be used again in 2014? Shouldn't NRC get on top of that methodology, to make sure the gap doesn't happen again? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** What was the composition of the concrete used in the pour, and the rebar installed, during the Shield Building breach repatch in 2011? Will the same concrete and rebar be used again in 2014? How can NRC allow this, given the 2011-2014 gap in the Shield Building wall? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Given the large number of NRC inspectors at Davis-Besse in late 2011, and the enhanced oversight by NRC, as demanded by Congressman Kucinich, what follow up was conducted to make sure the re-sealing of the Shield Building was done well? How was a bad concrete pour allowed to happen? Would the Shield Building has stood up to the test of a tornado missile, or internal reactor core meltdown, during the past 2 years of full power operations, if the test had come?! Would a hazardous radioactivity release have occurred, had a tornado

struck or a meltdown occurred? Has NRC carried out engineering analyses to confirm this? [Kevin Kamps] [kevin@beyondnuclear.org]

- Q:** Wasn't the Davis-Besse Shield Building designed and constructed badly in the first place? For example, out of plumb vertical lean, which has exerted large pressures and forces on the underside of the lean for four decades now? Hasn't that damaged the structural integrity of the Shield Building? Combined with the 2011-2014 gap in th Shield Building wall, was the containment structure adequate to withstand tornado missiles, or the pressures of a reactor core meltdown? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Didn't the Shield Building wall gap, combined with the Shield Building wall's severe cracking, add up to a compromised containment system during the Dec. 2011 to recent 2014 full power reactor operations at Davis-Besse? What if a tornado missile had hit that soft spot? What if an internal reactor core meltdown, its pressures, attacked the Shield Building? Would it have contained the catastrophic amounts of hazardous radioactivity inside, or released it to the environment to blow downwind, flow downstream? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** An engineering question: How can the utility claim the structural integrity of the shield building is as robust as it can be, even with the void? Isn't it a simple engineering fact that it must have been compromised, to some degree, simply because a void existed? How can a concrete wall with a void 25 feet long, 6-12 inches wide and of unknown thickness be as strong as one that doesn't have such a void? I know the NRC has not come out yet and agreed with the utility's findings - but, conversely, why hasn't it corrected them? That was part of the problem before, according to the NRC and area congressmen - that the NRC allowed misstatements in the media to go unchallenged. Wasn't the NRC going to improve its own processes to respond more quickly to such things? [Tom Henry] [thenry@theblade.com]
- Q:** What is the basis for, and the modeling done to support, the statement contained in the NRC Event Notification Report, Event Number 49828, dated February 14, 2014, which states, in part, that:
“...Analysis shows this condition is bounded by previous calculations that demonstrate the containment function is maintained such that the protection of the health and safety of the public was not in question. Further analysis is planned to reconfirm previous calculations.”
This NRC Event Notification Report, Event Number 49828, dated February 14, 2014, is posted online at: <http://www.nrc.gov/reading-rm/doc-collections/event/status/event/en.html#en49828> [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** Does NRC have any basis for, and the modeling done to support, FENOC spokesperson Jennifer Young's claim, reported in a February 14, 2014 Toledo Blade article (posted online at <http://www.toledoblade.com/local/2014/02/14/Gap-in-concrete-discovered-in-Davis-Besse-s-protective-shell.html>), that there is “no reason to believe the flaw [the air pocket or gap in the Shield Building wall first reported that very day] compromised the integrity of the outer shield building while the plant was online the last two years.”[Kevin Kamps] [kevin@beyondnuclear.org]]
- Q:** Did NRC and FENOC miss the “air pocket” or “gap” in the Shield Building wall, because FENOC had installed metal plates on the inside surface of the wall when pouring the

replacement concrete in late 2011. Why did NRC allow FENOC to leave the metal plates in place, making visual examinations and inspections of the concrete and steel rebar impossible? [Kevin Kamps] [kevin@beyondnuclear.org]

- Q:** Why did NRC not require that industry standard wooden forms be used, and simply removed, after the Shield Building replacement wall's concrete had cured in late 2011? [Kevin Kamps] [kevin@beyondnuclear.org]
- Q:** What will be done differently by the plant and the NRC this time to ensure the poured concrete does not leave any voids? [Dennis Jensen] [jensend@co.ottawa.oh.us]
- Q:** Given the recent revelation of the inadequate oversight and inspection of the Shield Building during closing of the structure in November 2011, what assurances does the NRC provide the public of the closing of the Shield Building after the Steam Generator replacement? How could NRC Staff have missed the 6 to 12 inch wide gap in the Shield Building wall in late 2011, given the increased NRC inspectors on-site due to the severe cracking, as well as the widespread public concern, as represented by U.S. Congressman Dennis Kucinich's involvement?
[Michael Keegan] [mkeeganj@comcast.net]
- Q:** Why did NRC let FENOC do a rush-job on the Shield Building re-sealing in October 2011? How did so many NRC inspectors, with enhanced oversight, miss the bad pour of concrete that led to this 6 to 12 inch void or gap or air space in the Shield Building wall?! [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

As of the date of the Webinar (February 20, 2014), the void in the interior wall of the shield building was a recently found item. The licensee did initially contend that the void did not negate the design function of the shield building and containment vessel. The ongoing steam generator inspection (see NRC Inspection Manual Inspection Procedure 50001, "Steam Generator Replacement Inspection" (ML11206B197)) will review the licensee's investigation, conclusions, and the licensee's corrective action. Prior to plant restart, the openings in the steel containment vessel and the concrete shield building will have to be closed and the walls restored to vessel and building design requirements. Results of the NRC inspections will be documented in a publicly available inspection report.

Other: Containment System Questions

- Q:** Please why holes were discovered since the NRC as well as BD Staff have been onsite since BD first went into service. [Don Leichtling] [captddd@gmail.com]
- Q:** Davis-Besse has operated its atomic reactor for the past two years with steam generators degraded enough to require replacement, as well as a 40% (12-inch-wide) gap or air space in its 30-inch-wide Shield Building wall. What if the degraded steam generators had suffered a cascading failure of steam generator tubes, Loss of Coolant Accident (LOCA), reactor core meltdown? Would the Shield Building have contained the catastrophic amounts of hazard radioactivity, without leaking them into the environment to blow downwind and flow downstream. What engineering analysis has FENOC or NRC undertaken upon which to

base any assertion that the past two years of operations have been compliant with safety regulations, given the 40% gap in the Shield Building wall? Is sheer luck (that the containment was not tested over the course of the past two years of full-power operations) an acceptable form of atomic safety regulation? [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

The steel containment vessel and the concrete shield building form a containment system (see slide numbers 13 through 18 of FENOC's presentation during a public meeting addressing shield building cracking – ADAMS Accession Number ML1200050146). The steel containment vessel is the primary barrier to mitigate/minimize any radioactive releases to the environment and the general public in the event of breach of the first two barriers to release. The zirconium alloy fuel rod outer casing is the first barrier to release and the second barrier is the reactor coolant system (reactor vessel and reactor coolant piping). As part of the design, it has to be shown via analysis, that in the event of failure of the first and second barrier, the third barrier (the steel containment vessel) is capable of containing the majority of any released radioactive gasses and particles. In the design of the plant, accident analyses assume, to show the capability of the containment vessel, that the first and second barriers are breached. Those analyses, which must be kept current if changes are made to the plant, show that the containment vessel is capable of containing all or most of any radioactive material from design bases accidents. However, it is assumed in radiation dose analyses that there will be some amount of leakage through the containment vessel.

In the Davis-Besse design there is a concrete shield building that surrounds the above ground portion of the containment vessel; it is approximately, at the side walls, 4.5 feet from the containment vessel. Thus an annulus is formed into which any leakage from the containment vessel will leak. At Davis-Besse, any leakage of radioactive material from the containment vessel into this annulus would be filtered by an accident mitigation ventilation system prior to being released outside of the plant, and would reduce any potential offsite radiation doses.

The steel containment vessel has to be periodically pressure tested in accordance with Appendix J to 10CFR Part 50 (Primary Reactor Containment Leakage Testing for Water-Cooled Power Reactors). That testing was conducted at the conclusion of the Davis-Besse 2011 reactor head replacement outage and documented as a successful surveillance test in IR05000346/2011005 (ML12032A119). The ability of the accident mitigation ventilation system to draw the required vacuum and cause flow is periodically tested in accordance with the plant's existing Technical Specifications. The ability of the filtration system associated with the accident mitigation ventilation system is also periodically tested.

Other: Safety

Q: Will the new steam generators and the damaged shield building withstand earthquakes from the fault lines , the one from cleveland to toledo? Researchers have said fracking for natural gas increases earthquake activity, as does injecting the fracking liquids into Ohio's waste wells. Will the steam generators and shield building withstand those earthquakes [William Katakis] [telomere@sbcglobal.net]

Answer

The Davis-Besse Nuclear Power Station was designed to safely shutdown and maintain the plant in a safe condition in the event a large, so-called Design Basis Earthquake or also called a Safe Shutdown Earthquake. When the plant was originally designed the maximum credible earthquake was formulated and the plant was designed to withstand the calculated forces from such an earthquake, so that the plant could be maintained in a safe condition. The requirement for the plant to be able to withstand such an earthquake still exists.

Other: Waste

Q: Would near-term dealing with the radioactive steam generators mean sending them to NewGreen for "recycling" into consumer products? [Kevin Kamps] [kevin@beyondnuclear.org]

Q: Will NRC allow Davis-Besse's radioactive old steam generators to be "recycled" at NewGreen near Perry? How can NRC allow radioactive metal to be used to fabricate consumer products? What about the hazard the radioactivity would represent for consumers wearing radioactive pants zippers, for example? [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

The licensee has informed the NRC of its plans to have long-term storage of the "old" steam generators in a specially designed facility onsite (see FENOC Presentation slide numbers 63 and 64 – ADAMS Accession Number ML13078A249). The NRC has not been informed of any plans "to recycle" the old generators.

Other: Individual Questions

Q: I have great concern over the hundreds of new workers on site. Does the NRC believe such a large complex undertaking such as replacement of steam generators require that management in a nuclear plant be able to effectively communicate expectations regarding procedural compliance and have personnel follow those procedures? [Victoria Clemons] [vclemons@roadrunner.com]

Answer

All workers at Davis-Besse, including contract workers, are required to comply with written procedures when performing work activities that affect quality onsite. Inspectors are onsite observing portions of the work activities associated with the steam generator replacements to ensure procedural compliance of those observed activities.

Q: Can we get a full transcript of this conversation? [Helen Jaccard] [helen.jaccard@gmail.com]

Answer

Audio files from the Webinar were placed in ADAMS (Accession number ML14066A044).

Q: Will NRC make publicly available, immediately, all communications and documentation having to do with NRC's mid- to late-November, 2011 decision to authorize the pouring of concrete and/or emplacement of steel rebar to re-seal the breach opened in the Davis Besse Shield Building, in order to allow restart of the Davis-Besse atomic reactor, after its reactor lid replacement, despite the mid-October 2011 revelation of severe cracking in the concrete Shield Building? [Kevin Kamps] [kevin@beyondnuclear.org]

Q: Will NRC make publicly available, immediately, any and all documents and communications having to do with the concrete pour and/or steel rebar emplacement to re-seal the breach (opened in order to replace the degraded reactor lid) in the concrete Shield Building at Davis-Besse in late November to early December 2011? Will this include all inspection reports, radiography test results, ultrasonic test results, acoustic tests, other test results, quality assurance (QA) inspections, tests, programs, protocols, methods, activities, logs, etc., and engineering calculations, used to ascertain or determine that the patch job on the Shield Building (concrete pour, steel rebar emplacement, etc.) performed in late 2011 by FENOC, its contractors, sub-contractors, etc., met all NRC construction, quality assurance (QA), health, safety and environmental protection requirements and regulations? [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

NRC activities and inspection results documented in Inspection Reports which, if not security-related, are available to all members of the public in ADAMS. Additionally, all non-sensitive and non-proprietary written communication between the FENOC and the NRC is available in ADAMS under the docket number of 05000346.

Q: Has there been an Nuclear Inspector hired to specifically oversee Davis-Besse and Prairie Island SG replacement? What is that persons name and how can they be contacted? [Michael Keegan] [mkeeganj@comcast.net]

Answer

NRC licensees, including the one that owns and operates Davis-Besse and the one that owns and operates Prairie Island, have requirements for complying with applicable requirements of the American Society of Mechanical Engineers Boiler and Pressure Vessel Codes. One of the requirements is to have a third party (an Authorized Nuclear Inspector) review and concur on certain modification and repair work. The NRC does not employ, under the Code, Authorized Nuclear Inspectors. Licensees make arrangements directly with Authorized Nuclear Inspector agencies.

Q: Both the Crystal River, FL, and San Onofre 2 & 3, CA, permanent closures represent multi billion dollar boondoggles. How can NRC allow Davis-Besse to risk such a billion-dollar boondoggle, as well as a catastrophic radioactivity release. [Kevin Kamps] [kevin@beyondnuclear.org]

Answer

NRC's Mission, as directed by law, is to license and regulate the nation's civilian use of byproduct, source, and special nuclear materials to ensure adequate protection of public health and safety, promote the common defense and security, and protect the environment. This is accomplished by various means including inspecting to verify that licensees comply with the terms and conditions of their licenses which include that the design and operation of a nuclear power plant minimizes the risk to the general health and safety of the public. Licensees are responsible for considering the economic consequences of their actions including complying with license requirements or deciding that plant decommissioning might be preferable to the economic costs that could be associated with compliance to some new or modified requirements.

Q: Please describe why the original SG Head had to be replaced along with any warpage or cracking that have been discovered to date. [Don Leichtling] [captddd@gmail.com]

Answer

This issue has been thoroughly researched with information on various aspects of the event available on the NRC public website at:

<http://www.nrc.gov/reactors/operating/ops-experience/vessel-head-degradation.html>

Additionally at that website you can download NUREG/BR-0353, "Davis-Besse Reactor Pressure Vessel Head Degradation: Overview, Lessons Learned, and NRC Actions Based on Lessons Learned."

LICENSEE: FirstEnergy Nuclear Generation, LLC

FACILITY: Davis-Besse Nuclear Power Station

SUBJECT: SUMMARY OF THE FEBRUARY 20, 2014, WEBINAR TO DISCUSS NRC INSPECTION ACTIVITIES ASSOCIATED WITH THE DAVIS-BESSE NUCLEAR POWER STATION INSTALLATION OF TWO NEW STEAM GENERATORS

On February 20, 2014, the U.S. Nuclear Regulatory Commission (NRC) held a Webinar to discuss the NRC inspection activities associated with the Davis-Besse Nuclear Power Station installation of two new steam generators and to provide an opportunity for interested parties to ask questions of the presenters. The NRC and meeting notice for this Webinar can be found in the Agencywide Documents Access and Management System (ADAMS) as ML14030A553. The presentation that was shown during the Webinar can also be found in ADAMS as ML14050A400.

The Webinar consisted of the NRC giving a short presentation and then responding to questions from interested parties sent in via the Webinar software. The audio recording of the session, which includes the recording of questions that were answered, is in ADAMS as ML14066A044. Enclosed are answers to in-scope questions that were not addressed during the Webinar. NRC participants in the Webinar are listed in the Webinar Meeting notice.

Sincerely,

/RA/

Jamnes L. Cameron, Chief
Branch 4
Division of Reactor Projects

Docket No. 50-346
License No. NPF-3

Enclosure:
Unanswered In-Scope Questions for the NRC
Meeting on February 20, 2014

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Letter to FirstEnergy Nuclear Generation, LLC from Jamnes Cameron dated March 21, 2014

SUBJECT: SUMMARY OF THE FEBRUARY 20, 2014, WEBINAR TO DISCUSS NRC
INSPECTION ACTIVITIES ASSOCIATED WITH THE DAVIS-BESSE NUCLEAR
POWER STATION INSTALLATION OF TWO NEW STEAM GENERATORS

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