

U.S. Nuclear Regulatory Commission Public Meeting Summary

Title: Discussion of Dominion's Response to Select Staff RAIs on North Anna Subsequent License Renewal Application

Date of Meeting: May 13, 2021, 2:00 pm – 5:00 pm

Location: Webinar

Type of Meeting: This is an Observation Meeting. This is a meeting in which attendees will have an opportunity to observe the U.S. Nuclear Regulatory Commission (NRC) performing its regulatory function or discussing regulatory issues. Attendees will have an opportunity to ask questions of the NRC staff or make comments about the issues discussed following the business portion of the meeting; however, the NRC is not actively soliciting comments toward regulatory decisions at this meeting.

Purpose of the Meeting(s):

To discuss Virginia Electric and Power Company's (Dominion Energy's) responses to select NRC requests for additional information (RAIs) associated with the safety review of the North Anna Power Station, Units 1 and 2 (NAPS) Subsequent License Renewal Application (SLRA). To enable the staff to gain a better understanding of Dominion Energy's approach to aging management and to formulate a path forward.

General Details:

The NRC staff held a public, observational meeting with Dominion Energy to discuss responses to select NRC RAIs associated with the safety review of the NAPS SLRA. The meeting began at 2:00 pm and ended approximately at 5:00 pm. There were 17 NRC staff members, 16 applicant staff and contractor, and 14 members of the public. The meeting began with introductions of the NRC staff, Dominion Energy staff and contractor, and members of the public who wished to introduce themselves.

Summary of Meeting:

- B2.1.35-1, RG 1.127, Inspection of Water-Control Structures Associated with Nuclear Power Plants

Dominion Energy began the discussion by correcting NRC's slide. The building in question is not the pump house, rather it is the Service Water Valve House (Settlement Marker SM-28).

Dominion Energy explained that the settlement of SM-28 has slightly exceeded 75 percent of the Technical Requirements Manual (TRM) Section 3.7.7 allowable value. In accordance with the TRM, a condition report (CR) has been submitted and Dominion Energy staff determined that there is no immediate challenge to the functionality of plant equipment. Based on data, settlement of SM-28 is projected to remain below the 100 percent allowable settlement limit of TRM Section 3.7.7 until at least 2036. Dominion Energy confirmed that the CR response is consistent with RAI B2.1.35-1 response and other information provided.

The NRC staff noted that 2036 is very near to the beginning of the SPEO (2038 for Unit 1 and 2040 for Unit 2). The NRC staff asked how this settlement will be addressed if 100 percent limit is reached.

Dominion Energy explained that the TRM requires an evaluation be completed within 60 days if settlement of a monitored location exceeds the 75 percent limit. The allowable settlement for SM-28 is based on limiting pipe stresses. Dominion Energy noted that the current planned corrective action, which will be implemented well before the 100 percent limit is reached, is to increase the allowable settlement of SM-28 by adjusting piping expansion joint tie-rods. This approach will reset the TRM settlement limits for SM-28 and is similar to the approach taken in 2009. The staff questioned if Dominion Energy plans to take this approach each time the settlement of 100 percent limit is approached. Dominion Energy explained that at this time it will be doing a reanalysis and believes that the settlement is leveling off. Dominion further explained that the corrective actions noted above are based on the TRM and normal procedures during the current period of extended operations and will continue to the subsequent period of extended operations.

- B2.1.7-1, Pressurized Water Reactor (PWR) Reactor Vessel Internals

Dominion stated that loss of material due to pitting and crevice corrosion was not identified as an aging effect requiring management for NAPS stainless steel or nickel alloy reactor vessel internals components because NUREG-2192 (SRP-SLR), Section 3.1.2.2.9 (as amended by SLR-ISG-2021-01-PWRVI) references Electric Power Research Institute (EPRI) MRP-227 Revision 1-A for applicable aging mechanisms for PWRVI components and EPRI MRP-227 does not specifically identify loss of material due to pitting and crevice corrosion as an aging effect requiring aging management.

The NRC staff explained that crediting of the water chemistry program is the reason that pitting and crevice corrosion did not need to be addressed for the EPRI evaluation of aging mechanisms supporting MRP-227. If the water chemistry program was discontinued, pitting and crevice corrosion would become a concern. Therefore, it is important to credit the water chemistry program to manage loss of material due to pitting and crevice corrosion.

Dominion Energy stated that the water chemistry aging management program (AMP) is credited in the RVI AMP for aging management but it is specifically for managing aging of stress corrosion cracking and not loss of material due to pitting and crevice corrosion. Dominion Energy relies on an EPRI Expert Panel corrosion evaluation by Westinghouse and documented in a NAPS document.

The NRC staff explained that pitting and crevice corrosion are not screened in for the EPRI evaluation of aging mechanisms supporting MRP-227 specifically because good water chemistry practices at PWRs prevent pitting and crevice corrosion. The NRC staff further explained that if the water chemistry program does not prevent pitting and crevice corrosion, then there needs to be an exception to the PWR Vessel Internals AMP.

NRC management inquired: if a PWR did not have a good water chemistry program, would there still not be pitting, and crevice corrosion?

Dominion Energy stated it could not go that far.

Dominion Energy and NRC staff agreed that each organization will discuss the issue internally.

- B2.1.15-1 Basis for 20-Year Replacement Frequency for Diesel Engine Heat Exchanger

As background, Dominion Energy explained that the

1. Diesel-driven fire pump engine and skid-mounted subcomponents were originally addressed in SLRA as an active assembly, not subject to aging management review (AMR) per 10 CFR 54.21(a)(1)(I)
2. Active status is consistent with NUREG-2192, Table 2.1-6 item 55. Equipment performance is managed via Maintenance Rule
3. Similar component was recently questioned at Peach Bottom and active status was accepted in RAI response, documented in SER 2.3.3.14.2

In response to the RAI, Dominion Energy has proposed to change its aging management of the diesel engine heat exchanger on a 20-year frequency. Therefore, the diesel engine heat exchanger is not subject to AMR per 10 CFR 54.21(a)(1)(ii). Further, considering what the License Renewal Rule and associated industry guidance indicates for short lived components, Dominion stated that it does not need to provide justifications for the timeliness of replacements.

NRC staff stated that if this had been submitted initially as a short-lived component, the NRC scoping and screening staff would have looked at the timeliness of the replacement and the associated justification.

Dominion Energy stated that the recent failure has been found, identified, and corrected during preventative maintenance. Post maintenance testing identified the tube failure which was addressed prior to return to service.

Dominion Energy and NRC staff agreed that each will discuss internally.

- B2.1.27-1 Cyclic Fatigue of Buried Gray Cast Iron Using Jockey Pump Monitoring
B2.1.21-1 Basis for Extent of Inspections for Selective Leaching
B2.1.21-2 Basis for Single 10-Foot Sample for Selective Leaching

Dominion Energy considered these RAIs to be interrelated and discussed them as one and provided a history of the aging management:

- Six pipe ruptures due to cracking of cementitious lined buried gray cast iron fire protection piping occurred between 1984 and 2003 during the first half of installed pipe service life
- Corrective actions as a result of the 2003 event prevented future occurrence by minimizing or eliminating overpressure events in the fire water system

- A design change resulted in replacement of over 500 feet of cementitious lined buried gray cast iron piping with a higher pressure rated cementitious lined ductile iron piping
- Of the 30 buried pipe inspections performed by the underground piping and tank inspection (UPTI) program since its initial excavations in 2011, there were seven inspections of cementitious lined buried gray cast iron fire protection piping
- In 2015, the piping inspection guidance of the UPTI program that included selective leaching inspection guidance was enhanced to consider susceptible materials and look for the presence of selective leaching by visual, mechanical, or other appropriate means
- None of the UPTI inspections of cementitious lined buried gray cast iron fire protection piping identified through wall leakage or minimum wall violations

The NRC staff noted that the rupture in 2003, although caused by a false alarm, was an actual system demand. The pipe rupture caused a failure of the system. Dominion Energy determined that the pipe failure was the result of pressure transient caused by the starting of the various pumps. The NRC staff further noted that part of the corrective action was to adjust how the system testing was performed to minimize these pressure variants. The NRC staff stated, as evidenced by the 2003 rupture, actual demands cause pressure transients that can identify pipe cracking, and corrosion that may not be identified during testing because the test procedures were changed.

Regarding monitoring with the jockey pump, the NRC staff asked what a normal leak rate on the fire water system is and how often the jockey pump runs. Dominion responded that a better question is how the control room operators monitor the alarms.

Dominion Energy noted that auto start of fire pumps due to system demands are continuously monitored in the control room. In addition, jockey pump operations are monitored during operator rounds. The water level in the hydro-pneumatic tank is read once per shift using a tank site glass. A four gpm leak would give 1-inch drop in level in one minute, allowing the operators to identify a leak/drop in level and to take action in accordance plant operating procedures. The jockey pump works to keep the pressure of the tank at 95 psig to 110 psig and is capable of pumping 30 gpm.

The NRC staff questioned how and where the tank water level readings are taken and if the operator can see/hear whether the jockey pump is operating. Dominion Energy indicated that the jockey pump and the tank water level site glass are not in the same location. Further, Dominion Energy noted that an operator would have to visually check to see if the jockey pump was operating.

Changing topics, NRC staff asked Dominion Energy if any indications of selective leaching were prior to 2015 when the inspection procedures were changed. Dominion Energy indicated that none of the seven buried cast iron piping inspections conducted since 2011 identified any through wall leakage or minimum wall violations and, in addition, demonstrated good internal/external coatings. (see slide 7)

Dominion Energy explained that buried gray cast piping is a unique subset of selective leaching. The Dominion Energy program includes two types of inspection – periodic and opportunistic – and uses a 1-ft segment size that is standard throughout Generic Aging Lessons Learned (GALL) Report. Dominion Energy further explained that AMP XI.M38 is very clear that any grouping of 1-ft segment is acceptable.

NRC staff questioned how excavation of one 10-ft segment of piping to conduct eight inspections would be representative. Dominion Energy explained that its program was not attempting to be representative but would identify the worst-case leading location. NRC staff further questioned how many feet of pipe would be within the most susceptible location.

Dominion Energy explained that if any of the initial inspections did not meet acceptance criteria, GALL sample expansion criteria would require five additional samples due to the size of the sample population. As noted in the previous operating experience discussion, Dominion Energy has not identified any through wall leakage or minimum wall violations due to selective leaching.

NRC staff stated that it seems strange that NRC guidance would find it acceptable that all eight samples would come from one length of pipe. Dominion Energy responded that in the Buried and Underground Piping and Tanks Program, buried piping inspections are based on inspection segments consisting of 10 one-foot lengths of piping. The Buried and Underground Piping and Tanks Program does not indicate ten different excavations would be required for one inspection segment.

Dominion Energy and NRC staff agreed that each will discuss internally.

Public Participation Themes:

There were 14 members of the public on the phone.

Action Items/Next Steps:

The NRC staff will prepare and issue a meeting summary.

Attachments:

Meeting description and agenda – ADAMS Accession No. [ML21132A287](#)
NRC slide presentation – ADAMS Accession No. [ML21132A289](#)
Dominion slide presentation – ADAMS Accession No. [ML21145A217](#)