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10 CFR 50
10 CFR 51
10 CFR 54

June 12, 2019

U. S. Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, DC 20555-0001

Peach Bottom Atomic Power Station, Units 2 and 3
Renewed Facility Operating License Nos. DPR-44 and DPR-56
NRC Docket Nos. 50-277 and 50-278

Subject: Revised Response to NRC Request for Additional Information, Buried Pipe, related to the Peach Bottom Atomic Power Station, Units 2 and 3, Subsequent License Renewal Application

References:

1. Letter from Michael P. Gallagher, Exelon Generation Company LLC, to NRC Document Control Desk, dated July 10, 2018, "Application for Subsequent Renewed Operating Licenses"

2. E-mail from Bennett Brady, NRC to Michael P. Gallagher, Exelon Generation Company, LLC, dated April 10, 2019, "Requests for Additional Information for the Safety Review of the Peach Bottom Atomic Power Station, Units 2 and 3 Subsequent License Renewal Application – Set 1"

3. Letter from Michael P. Gallagher, Exelon Generation Company LLC, to NRC Document Control Desk, dated May 2, 2019, "Response to NRC Requests for Additional Information, Set 1, dated April 10, 2019 related to the Peach Bottom Atomic Power Station, Units 2 and 3, Subsequent License Renewal Application"

In Reference 1, Exelon Generation Company, LLC (Exelon) submitted the Subsequent License Renewal Application (SLRA) for the Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3. In Reference 2, the NRC requested additional information (RAIs) to support staff review of the SLRA. In Reference 3, Exelon submitted the responses to the NRC Set 1 RAIs.

In a conference call held on June 5, 2019, the NRC identified that additional clarifying information was needed to support the Set 1 response to the following Buried Pipe RAI:

B.2.1.28-1

This letter provides the revised response to the above RAI to address the additional information discussed on June 5, 2019. The enclosed revised RAI response supersedes the response to RAI B.2.1.28-1 previously submitted in Reference 3.

The enclosure to this letter contains the revised response to the above Buried Pipe RAI B.2.1.28-1.

There are no updates to the SLRA as a result of the revised response.

This letter contains no new regulatory commitments.

If you have any questions, please contact Mr. David J. Distel, Licensing Lead, Peach Bottom Subsequent License Renewal Project, at 610-765-5517.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 12th day of June 2019.

Respectfully submitted,

Michael P. Gallagher
Vice President - License Renewal and Decommissioning
Exelon Generation Company, LLC

Enclosure: Revised Response to Set 1 Buried Pipe Request for Additional Information (RAI) B.2.1.28-1

cc: Regional Administrator – NRC Region I
NRC Senior Project Manager (Safety Review), NRR-DMLR
NRC Project Manager (Environmental Review), NRR-DMLR
NRC Project Manager, NRR-DORL- Peach Bottom Atomic Power Station
NRC Senior Resident Inspector, Peach Bottom Atomic Power Station
R.R. Janati, Pennsylvania Bureau of Radiation Protection
D.A. Tancabel, State of Maryland

Enclosure

Revised Response to Set 1
Buried Pipe
Request for Additional Information
Peach Bottom Atomic Power Station, Units 2 and 3
Subsequent License Renewal Application (SLRA)

RAI B.2.1.28-1

1. GALL-SLR AMP XI.M41 Buried and Underground Piping and Tanks

Regulatory Basis:

10 CFR 54.21(a)(3) requires an applicant to demonstrate that the effects of aging for structures and components will be adequately managed so that the intended function(s) will be maintained consistent with the current licensing basis for the subsequent period of extended operation. One of the findings that the staff must make to issue a renewed license (10 CFR 54.29(a)) is that actions have been identified and have been or will be taken with respect to managing the effects of aging during the subsequent period of extended operation on the functionality of structures and components that have been identified to require review under 10 CFR 54.21, such that there is reasonable assurance that the activities authorized by the renewed license will continue to be conducted in accordance with the current licensing basis. In order to complete its review and enable making a finding under 10 CFR 54.29(a), the staff requires additional information in regard to the matters described below.

RAI B.2.1.28-1

Background:

SLRA Section B.2.1.28, "Buried and Underground Piping and Tanks," states the following:

a) The program will be consistent with the ten elements of GALL-SLR Report AMP XI.M41, "Buried and Underground Piping and Tanks."
b) Coating will be applied to buried portions of the 10-inch diameter stainless steel line from the torus dewatering tank to the condensate transfer pump suction line in accordance with approved station specifications, during the 10-year period prior to the subsequent period of extended operation (SPEO).
c) Visual inspections of buried piping within the scope of license renewal will be in accordance with GALL-SLR Report Table XI.M41-2, "Inspection of Buried and Underground Piping and Tanks."

GALL-SLR Report AMP XI.M41 recommends the following:

a) One inspection for buried stainless steel in each 10-year inspection period beginning 10 years prior to the SPEO. This recommendation is based on all in-scope buried stainless steel being coated in accordance with the "preventive actions" program element of GALL-SLR Report AMP XI.M41 during the inspection period.

b) Additional inspections, beyond those in GALL-SLR Report Table XI.M41-2 may be appropriate if exceptions are taken to program element 2, "preventive actions."

Issue:

The staff noted that the buried stainless steel piping could be uncoated during portions of the 10-year period prior to the SPEO. Additionally, GALL-SLR Report AMP XI.M41 recommends that additional inspections may be appropriate if exceptions are taken to the "preventive actions" program element. SLRA Section B.2.1.28 does not provide a basis for not being consistent with GALL-SLR Report AMP XI.M41 in regard to conducting only one inspection of uncoated buried stainless steel piping during the 10-year period prior to the SPEO.

Request:

State the basis for why one inspection is appropriate for buried stainless steel piping during the 10-year period prior to the SPEO. Address relevant parameters such as the approximate length of buried uncoated stainless steel piping, the approximate length of buried coated stainless steel piping, results of soil corrosivity testing, etc.

Exelon Response:

Background:

During a 2014 buried piping inspection of adjacent torus dewatering tank attached piping, it was identified that the 10-inch diameter stainless steel line from the torus dewatering tank to the condensate transfer pump suction line was uncoated. This 10-inch diameter stainless steel line is the only known in-scope buried uncoated stainless steel piping. The torus dewatering tank and attached piping were installed following original construction as a plant modification. All other in-scope stainless steel piping is coated in accordance with station specifications for external surface treatment of buried metallic pipe with either a coal tar based Somastic coating, coal tar enamel with felt wrap coating, or coal tar based tape coatings, which satisfy the requirements outlined in the Preventive Actions program element of GALL-SLR Report AMP XI.M41.

Piping Lengths:

The uncoated buried segment of 10-inch diameter stainless steel piping totals approximately 44-inches in length, which is the entire buried portion of this line. There is a total of approximately 270 feet of buried in-scope stainless steel piping installed at Peach Bottom and therefore, the uncoated portion is a small percentage (1.5 percent) of the overall length of piping being age managed. Additionally, the buried piping program at Peach Bottom manages a total of approximately 1100 feet of buried stainless steel piping (including in-scope and not in-scope piping), which includes piping containing radioactive materials required to be inspected by NEI 09-14.

Inspection Results/Projections:

During NEI 09-14 inspection excavations, ultrasonic examination inspections, shear wave of pipe welds, guided wave inspections, and permanent guided wave collar installations for future structural health monitoring were performed on adjacent locations on buried stainless steel piping in the Unit 3 CST moat. Direct ultrasonic examination on not in-scope uncoated stainless steel piping at this excavation location indicated favorable results, with acceptable readings based on minimal amounts of wall loss/corrosion ranging from 0.5 to 0.6 mils per year. Based upon corrosion rates consistent with those found via direct examination methods, the resulting wall thickness projections for the 10-inch diameter stainless steel piping between now and the next inspection result in pipe wall thicknesses that significantly exceed minimum wall thickness requirements. Guided wave indicated that direct UT results were representative for the conditions identified and nothing beyond the excavation required verification.

Physical Configuration:

Direct visual inspections of the 10-inch diameter stainless steel line confirmed that there is not a pipe support that would result in a carbon steel to stainless steel galvanic interaction (consistent with design). Additionally, the extended exposure to the atmosphere prior to backfill means that a stable oxide was formed post-excavation and not disturbed during backfill, which reduces the

risk for active to passive stainless galvanic effects. The 10-inch stainless steel line was originally backfilled with select engineered fill (sand) and the portion exposed during the buried piping excavation was backfilled with flowable fill (low-modulus concrete). Stainless steel piping has shown superior corrosion resistance in buried applications when effective preventative measures including proper backfill are utilized. An assessment of the configuration and local environment confirmed that there was a low risk of corrosion on this uncoated piping.

Soil Properties:

Soil samples extracted adjacent to the torus dewatering tank near the subject excavation were classified as non-corrosive based on resistivity and anion/cation abundance in accordance with ANSI/AWWA C105/A21.5-10 soil test evaluation guidance. Soil observed in each boring or excavation was moist, but generally demonstrated good drainage properties (actual 10-inch stainless steel pipe is located above the mean ground water levels, thus resulting in minimal water to drive any corrosion effects), aerobic conditions with oxygen reduction potentials greater than 250 mV, and basic to slightly basic pH, which do not generally promote corrosion of buried piping or the growth of sulfide reducing bacteria. Soil resistivity, which is generally inversely correlated with corrosion rates and soil corrosivity is most sensitive to the abundance of specific species of anions and cations in soil pore water and soil particle arrangement, size and mineralogy. Soil sample results from Peach Bottom did not show a strong inverse correlation between the overall abundance and/or specific abundance of anions or cations present in each sample versus the resistivity of each sample (adjacent soil sample resistivity readings exceeded 4000 Ohm-cm). This suggests that electro-chemical processes associated with cathodic protection, stray current, and dissimilar metals are likely the dominant properties controlling soil corrosivity and corrosion rates within site soils and the soils do not present elevated risk to corrode stainless steel piping.

In support of the station cathodic protection upgrades, a stainless steel electrochemical monitoring device (Smartstack) was installed at a nearby location to monitor for active/potential corrosion concerns for buried stainless steel piping at the site. The installed device yielded a corrosion rate of 0.35 mils per year which based upon similarities in soil/environment, can be considered applicable to the location of the uncoated stainless steel pipe.

Conclusion:

In summary, the inspection of the above described uncoated buried stainless steel piping will be performed in the 10-year period prior to the SPEO. The basis for this approach is that (a) the percentage of buried uncoated stainless steel pipe is small relative to the overall length of buried stainless steel pipe, (b) favorable UT inspection results have been recorded, (c) resulting projection of remaining wall thickness is acceptable, (d) configuration is favorable, and (e) low soil corrosivity potential results have been demonstrated as described above. The uncoated 10-inch diameter stainless steel line will be the location for one of the two inspections in the 10-year period prior to the SPEO prior to the reapplication of the pipe coating, since it represents a worst-case condition of all buried stainless steel piping and is therefore bounding. Since all other in-scope stainless steel (not covered under Enhancement No. 7) are coated in accordance with the Preventive Actions program element of GALL-SLR Report AMP XI.M41, performing these two inspections of buried stainless steel piping for a two unit site is consistent with GALL-SLR Report AMP XI.M41.

No updates to the SLRA are required as a result of this response.