Exelon Generation®

200 Exelon Way
Kennett Square, PA 19348
www.exeloncorp.com

10 CFR 50.90

March 19, 2021

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

R. E. Ginna Nuclear Power Plant
Renewed Facility Operating License No. DPR-18
NRC Docket No. 50-244

Subject: Response to Request for Additional Information by the Office of Nuclear Reactor Regulation to Support Review of R. E. Ginna Nuclear Power Plant, License Amendment Request to Modify the Steam Generator Tube Inspection Frequency

References:
1. Letter from D. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "Application to Revise R. E. Ginna Technical Specifications for Steam Generator Tube Inspection Frequency," dated September 21, 2020
2. Letter from V. Sreenivas (Senior Project Manager, U.S. Nuclear Regulatory Commission) to J. Hodge Exelon), "Ginna: RAI-Steam Generator LAR to revise Technical Specifications for Steam Generator tube inspection frequency - EPIDS L-2020-LLA-0207," dated March 17, 2021

By letter dated September 21, 2020, (Reference 1) Exelon Generation Company, LLC (Exelon) requested to change R. E. Ginna Nuclear Power Plant (Ginna) Technical Specifications (TS). The proposed amendment request would modify Ginna TS License Amendment Request to modify the SG inspection frequency.

On March 16, 2021, the U.S. Nuclear Regulatory Commission (NRC) identified a draft request for additional information necessary to complete the review. On March 17, 2021 (Reference 2), the NRC issued to Exelon a formal request for additional information.

Attachment 1 to this letter contains the NRC's request for additional information immediately followed by Exelon's response.

Exelon has reviewed the information supporting a finding of no significant hazards consideration and the environmental consideration provided to the NRC in Reference 1. The additional information provided in this response does not affect the bases for concluding

that the proposed license amendment does not involve a significant hazards consideration. Furthermore, the additional information provided in this response does not affect the bases for concluding that neither an environmental impact statement nor an environmental assessment needs to be prepared in connection with the proposed amendment.

There are no commitments contained in this response.

Should you have any questions concerning this letter, please contact Jessie Hodge at (610) 765-5532.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 19th day of March 2021.

Respectfully,

David T. Gudger

David T. Gudger
Sr Manager - Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachments: 1. Response to Request for Additional Information

cc: USNRC Region I, Regional Administrator w/ attachments
USNRC Senior Resident Inspector, Ginna "
USNRC Project Manager, Ginna "
A. L. Peterson, NYSERDA "

ATTACHMENT 1

Response to Request for Additional Information

Attachment 1, Section 4.3 “Secondary Side Components,” discusses Flow Accelerated Corrosion (FAC) of the secondary moisture separator base plates. During refueling outage G1R40, visual inspection and laser profilometry were performed on all 85 secondary separators in both SGs. The deepest degradation from FAC was measured as 51% through the plate. Given that the G1R44 projected through-thickness degradation of SG A Separator 46 is only 5% less than the value at which analysis predicts base plate perforation,

1a. Please discuss any additional conservatisms in the through-wall degradation projections beyond the assumption of when FAC initiated.

RESPONSE:

The following conservatisms were considered as part of the degradation projections, and have been considered in determining the appropriate timing for future inspection and potential repair:

The worst case, i.e., most degraded separator, SG A Separator 46, had a visually apparent magnetite layer built-up on the surface outside the central area of FAC degradation. The laser profilometry method measures the difference in distance to the area of interest as compared to a reference point on an assumed undegraded surface location. In the wall loss calculation this approach conservatively adds the thickness of the magnetite layer to any actual wall loss present. The magnetite layer typically measures in the range of 0.010” to 0.020” which is a significant percentage of the 0.068” of apparent wall loss reported for SG A Separator 46 using the laser profilometry method.

Although the analysis references the ASME Code design criteria the Ginna secondary moisture separators are not considered in the ASME Code as pressure boundary components. The 90% through wall degradation minimum allowable calculated using the ASME Code referenced in the LAR submittal is conservative since it was based on an assumed uniform depth thinned circular region measuring 4 inches in diameter. The most significantly degraded circular areas at Ginna and the two other plants of similar design that have identified perforations, typically measure less than 2 inches in diameter which equates to a 95% through wall degradation minimum allowable thickness of the thinned region. This means the limiting separator, SG A Separator 46, more realistically has a predicted margin at G1R44 of 10%TW (= 95%-85%). Conservative differential pressure loads were also applied by the SG OEM during the calculation of this minimum allowable wall thickness.

In the analysis provided for Ginna’s secondary moisture separator baseplate there were two additional conservatisms applied in the growth rate projections. Conservatively it was assumed that the worst-case growth rate will occur at every separator and secondly, that the growth rate will be constant at every separator over every operating cycle until G1R44. The international plant that has experienced perforations has trended their growth rate and the 95th percentile growth rate is approximately 3%/yr which is half the growth rate assumed in the Ginna analysis. Operating experience where FAC degradation has been trended over several cycles in swirl vane type primary moisture separators for a

Westinghouse design have shown that growth rates from cycle-to-cycle are not uniform and have generally trended downward after the first discovery of FAC-induced wall loss.

1b. Compare the degradation in the Ginna separator 46 base plate to that observed in the two plants of similar design that have identified perforations and discuss why tube integrity will not be affected by potential loose part generation from secondary moisture Separator 46.

RESPONSE:

Based on the operating experience at the two plants of similar design that have identified perforations, there is conservatism related to if, and when, secondary separator baseplate degradation could become a threat to SG tube integrity. Specifically, the presence of a perforation or multiple perforations in a separator baseplate has a small effect on moisture removal efficiency but is not an immediate or documented threat to tube integrity. In order for such a threat to occur, further FAC degradation must occur symmetrically at multiple perforation locations in a circular pattern and then eventually link-up to liberate a small thin disc, leaving behind a larger hole (see REF 1, Slide 11). Based on the international plant's experience, that process, i.e., when the first perforation is seen to when a larger hole is seen, is estimated to take about 3 years. At an international plant where larger perforations did occur at a few locations, no disks were located visually or by eddy current testing; it is therefore postulated that no disks were formed and separated from the baseplate, ultimately falling into the tube bundle creating the potential for foreign object tube wear. Rather it is assumed that due to the very low pressure differential across the separator baseplates (approximately 2 psi) the ligaments between the small holes in the baseplate retain the central disk until the entire section is slowly worn away, resulting in one larger hole. The nature of the worst-case failure progression allowed a domestic plant of similar design with secondary separator baseplates having near through-wall degradation (i.e., > 90% TW) to continue to safely operate for 2 additional cycles before performing baseplate repairs. It is also Ginna's intent to remediate degraded secondary moisture separators prior to the formation of any significant size perforations that have the potential to challenge tube integrity.

REF 1: "Secondary Separator Degradation in B&W SGs", 16th Annual Environmental Degradation of Materials in Nuclear Power Systems conference (sponsored by NACE) Asheville, NC, August 2013.