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10 CFR 50.90

JAFP-21-0005

January 26, 2021

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

James A. FitzPatrick Nuclear Power Plant
Renewed Facility Operating License No. DPR-59
NRC Docket No. 50-333

Subject: Response to Request for Additional Information to support Review of License Amendment Request - Application to Modify Technical Specifications 3.6.1.3 "Primary Containment Isolation Valves"

References:

1. Letter from Dave T. Gudger (Exelon Generation Company, LLC) to U.S. Nuclear Regulatory Commission, "License Amendment Request - Application to Modify Technical Specifications 3.6.1.3, Primary Containment Isolation Valves," dated June 30, 2020

2. Email from Justin Poole (Nuclear Regulatory Commission Project Manager for the James A. FitzPatrick Nuclear Power Plant) to Enrique Villar (Exelon Nuclear Senior Licensing Engineer) titled "Request for Additional Information Regarding FitzPatrick Primary Containment Isolation Valve Amendment (L-2020-LLA-0145)," dated December 17, 2020

By letter dated June 30, 2020, Exelon Generation Company, LLC (Exelon) submitted a license amendment request to modify Technical Specifications 3.6.1.3, "Primary Containment Isolation Valves," for James A. FitzPatrick Nuclear Power Plant (FitzPatrick). In this request, Exelon requested to modify the configuration requirements for the reactor building suction valves during inerting and de-inerting the containment atmosphere.

By electronic mail dated December 17, 2020 (Reference 2), the NRC identified areas where additional information was necessary to complete its review. These additional RAIs were discussed with the NRC Staff in a clarification call held on December 17, 2020, and it was agreed to a response by January 31, 2021.

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 information attached to this letter does not affect the bases for concluding that the proposed license amendment does not involve a significant hazards consideration. Furthermore, the information attached to this letter 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.

If you should have any questions regarding this submittal, please contact Enrique Villar at 610-765-5736.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 26th day of January 2021.

Respectfully,

David T. Gudger

David T. Gudger
Senior Manager, Licensing
Exelon Generation Company, LLC

Attachment: 1. Request for Additional Information and Exelon Response

cc: Regional Administrator - NRC Region I
NRC Senior Resident Inspector - JAF
NRC Project Manager, NRR - JAF
A. L. Peterson, NYSERDA

ATTACHMENT 1

RESPONSE TO REQUEST FOR ADDITIONAL INFORMATION REGARDING

TECHNICAL SPECIFICATION 3.6.1.3 - PRIMARY CONTAINMENT ISOLATION VALVES

EXELON GENERATION COMPANY, LLC

JAMES A. FITZPATRICK NUCLEAR POWER PLANT

DOCKET NO. 50- 333

Title 10 of the *Code of Federal Regulations* (10 CFR) Section 50.36(c)(3) states that, "Surveillance requirements are requirements relating to test, calibration, or inspection to assure that the necessary quality of systems and components is maintained, that facility operation will be within safety limits, and that the limiting conditions for operation will be met."

Current TS Surveillance Requirement (SR) 3.6.1.3.1 contains valve configuration restrictions to prevent potential overpressurization (displacement) of the demister loop seals within the Standby Gas Treatment System (SGTS) should a Loss of Coolant Accident (LOCA) occur during containment venting.

By letter dated June 30, 2020 (Agencywide Documents Access and Management System (ADAMS) Accession No.ML20182A198), Exelon Generation Company, LLC ("Exelon" or "the licensee") submitted a license amendment request to modify Technical Specifications 3.6.1.3, "Primary Containment Isolation Valves," for James A. FitzPatrick Nuclear Power Plant (FitzPatrick). As defined in the application, the function of SGTS is accomplished with two 100 percent redundant SGT air filtration trains. Each filter train is physically and electrically independent. As described in Updated Final Safety Analysis Report (UFSAR) Section 5.3.3.4, upon receipt of an initiation signal at least one filter train fan will start up, and all valves in that train will open to draw air from the isolated Reactor Building at 6,000 cubic feet per minute (cfm). Based on this design, each SGTS train should be capable of withstanding applicable flow and pressures.

In the application, the Exelon Generation Company, LLC (the licensee) described new assumptions that were incorporated into previous analysis to reevaluate the potential for overpressure of demister loop seal and verify that the SGTS can withstand the LOCA-induced loads during the brief periods of containment venting. The licensee indicated the previous model maintained a fixed flow (equal to the fan flow) through the operating train of SGTS. One of the updated model assumptions is to allow free flow through both trains when evaluating overpressurization. It's described that the overpressure condition is driven by the pressure surge generated in the system by the drywell pressure change being higher than previously modeled. The Licensee described how the modeling of constant flow equal to that prior to the accident artificially increases the flow through the filter on the parallel train, which is noted as unrealistic representation of the scenario. Since the reanalyzed model assumes flow through both trains and higher surge pressure, it is not clear how worst case overpressure conditions for filter train and demister loop seal were defined and considered in the analysis.

Request

In order for the NRC staff to have a clearer understanding of the analysis, please provide the following additional details:

1. In the revised configuration, please describe what impact, if any, the accident environment (e.g., temperature, wet steam) will have on the SGT filter trains.

   <u>Exelon Response</u>

   The accident environment will not have an impact on the capability of the SGTS filter train equipment to perform its LOCA safety function. Upon high drywell pressure or low-low-low water level during inerting/deinerting, safety signals will be distributed within one (1) second to open the second train of SGTS, open the reactor building suction valves, and close the primary

containment isolation valves (PCIVs). Per the JAF Technical Specifications, the PCIVs will be closed within five (5) seconds.

From one (1) to six (6) seconds after initiation of a LOCA, the drywell mixture of steam, nitrogen, and air increases linearly from 230°F to 275°F. As the fluid mixture passes through approximately 500 feet of pipeline to get to the SGTS filter trains, the relatively cold intervening piping and components work to reduce the temperature of the fluid exiting containment. This cooling effect will also cause condensation to be deposited within the pipeline. In addition, ahead of each filter train is a demister and heater to remove entrained water and reduce the overall relative humidity prior to reaching the charcoal adsorbers.

The SGTS filter train is designed to be heat resistant to at least 250°F, the intervening components driving cooling / humidity reduction, and the short event cycle (six seconds), the accident environment will not have an impact on the SGTS filter train post-LOCA function.

2. Provide a discussion related to worst case conditions of:
   1) only one of the SGTS trains operating, or
   2) both SGTS trains operating during LOCA from the perspective of pressure surge and flow, and how they were evaluated.

<u>Exelon Response</u>

The case is modeled with a single train in operation prior to the LOCA and the opposite (isolated) train opening following a LOCA signal. As discussed below, this matches the conservative (and typical) system configuration and station response to a postulated LOCA during inerting/deinerting operations.

Typically, during inerting/deinerting the SGTS operates on a single train. The inlet and outlet valves on the opposite, parallel train are closed. Following the LOCA signal (low-low-low reactor water level or high drywell pressure), the inlet valve on the opposite train opens followed by the discharge valve. Before the LOCA, the flow is driven through the system by one SGTS train with its fan in operation; the alternate train is isolated. Valve opening time is based on the LOCA signal to the valve. The valves in the train which is in operation prior to the LOCA remain open. With a single train initially operating, pressure will be biased (higher) on the operating train until the opposite train isolation valves are opened. This maximizes the pressure at the SGTS filter train for the LOCA scenario. In the modeled case, the pressures remain below the design of the SGTS filter train and associated components.

In addition, to more accurately model the scenario, the flow through the fan is instantaneously terminated at the start of the LOCA and a modeled “bypass pathway” is opened to continue allowing flow through this train as it is driven by the LOCA pressure differential (surge flow instead of being driven by the fan). The fan and “bypass pathways” are parallel junctions in the RELAP5 model that represent the same physical flow path. They are modeled separately in RELAP5 to capture the different phenomena which drive the flow (fan flow pre-LOCA versus LOCA pressure differential during the LOCA).