

January 23, 2002

Mr. Michael P. Gallagher
Director-Licensing
Exelon Corporation
200 Exelon Way
Kennett Square, PA 19348

SUBJECT: REQUEST FOR ADDITIONAL INFORMATION FOR THE REVIEW OF THE
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

Dear Mr. Gallagher:

By letter dated July 2, 2001, Exelon Generation Company, LLC (Exelon), submitted for Nuclear Regulatory Commission (NRC) review an application, pursuant to 10 CFR Part 54, to renew the operating licenses for the Peach Bottom Atomic Power Station, Units 2 and 3. The NRC staff is reviewing the information contained in this license renewal application and has identified, in the enclosure, areas where additional information is needed to complete its review. Specifically, the enclosed request for additional information (RAI) is from Section 3.6, "Aging Management of Electrical and Instrument and Control."

Please provide a schedule by letter, or electronic mail for the submittal of your response within 30 days of the receipt of this letter. Additionally, the staff would be willing to meet with Exelon prior to the submittal of the response to provide clarification of the staff's request for additional information.

Sincerely,

/RA/

Raj K. Anand, Project Manager
License Renewal and Environmental Impacts Program
Division of Regulatory Improvement Programs
Office of Nuclear Reactor Regulation

Docket Nos. 50-277 and 50-278

Enclosure: As stated

cc w/encl: See next page

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REQUEST FOR ADDITIONAL INFORMATION
PEACH BOTTOM ATOMIC POWER STATION, UNITS 2 AND 3

3.6 Aging Management of Electrical and Instrument and Control

RAI 3.6-1

Sections 2.5.1, 2.5.2, and 2.5.3 of the LRA evaluate the aging effects applicable for electrical components that can be expected to occur due to: (1) moisture produced water trees, (2) radiation, and (3) heat, depending on environmental conditions. Further, the LRA states that water trees occur when the insulating materials are exposed to long term standing water, energized more than 25 percent of the time, be of medium voltage, and contained void or impurity. These trees eventually result in breakdown of the dielectric materials and ultimate failure. However, the LRA concludes that because Peach Bottom replaced suspected cables subjected to the water treeing criteria in 1995 and no cable failures have occurred since the replacement program was initiated, there is no need for the requirement for aging management program for medium voltage cable and connections. On January 2, 2002, you have provided summary of a paper entitled "An Assessment of Field Aged 15kV and 35KV Ethylene Propylene Rubber Insulated Cables" published in the 1994 T & D conference Proceedings in support of not having an aging management program for medium voltage cables exposed to an adverse localized environmental caused by moisture produced water trees and voltage stress. It is not clear to the staff that the above information is adequate for not having an AMP for medium voltage cables exposed to an adverse localized environmental caused by moisture produced water trees and voltage stress. However, the staff agrees that an AMP is not required if the cables were specifically designed for use in wet environments.

The LRA also concludes that because the maximum operating doses (1.5 times the existing radiation design value plus accident dose) of insulation material will not exceed the 60 year service limiting environment-radiation dose and because the maximum operating temperature of insulation material will not exceed the maximum temperature for 60 year life, no aging management are required for heat or radiation. Additionally, on January 2, 2002, you have stated that a plant walkdown was conducted outside containment (i.e., excluding drywell and steam tunnel) to identify any adverse localized equipment environments. It was concluded that only the PVC cables in the drywell credited for fire safe shutdown required an aging management activity. This conclusion is not consistent with the aging management program and activities for electrical cables and connections exposed to adverse localized environments caused by moisture, heat or radiation.

Most electrical cables in nuclear power plant are located in dry environments. However, some cables may be exposed to condensation and wetting in inaccessible locations, such as conduits, cables trenches, cable troughs, duct banks, underground vaults or direct buried installations. When energized medium voltage (2 kV - 15 kV) cables not specifically designed for submergence are exposed to these conditions, water treeing or a decrease in dielectric strength of the conductor insulation can occur. This can potentially lead to electrical failure. The radiation levels most equipment experience during normal service have little degrading effect on most insulation materials. Design basis calculations or evaluations bound the expected radiation doses for all plant areas. These evaluations usually account for additional doses seen in these areas due to infrequent operation line-up. However, some localized areas may experience higher than expected radiation condition. Typical areas prone to elevated radiation levels include areas near primary reactor coolant system piping or the reactor

pressure vessel, areas near waste processing systems and equipment, and areas subject to radiation streaming. The most common adverse localized equipment environments are those created by elevated temperature. Elevated temperature can cause equipment to age prematurely, particularly equipment containing organic materials and lubricants. The effects of elevated temperature can be quite dramatic.

Therefore, for non-EQ cables and connections (connectors, splices, and terminal blocks) within the scope of license renewal located in the turbine building, intake structure, main steam and feedwater platforms, yard structures, containment, the diesel generator building, and the auxiliary building, provide a description of the following:

- (1) An aging management program for accessible and inaccessible electrical cables and connections exposed to an adverse localized environmental caused by heat or radiation.
- (2) An aging management program for accessible and inaccessible electrical cables used in instrumentation circuits that are sensitive to reduction in conductor insulation resistance exposed to an adverse localized environment caused by heat or radiation.
- (3) An aging management program for accessible and inaccessible medium-voltage (2kV to 15kV) cables (e.g., installed in conduit or direct buried) exposed to an adverse localized environmental caused by moisture-produced water trees and voltage stress.

RAI 3.6-2

Under item (3) Parameters Monitored/Inspected, the LRA stated that the PVC insulation will be visually inspected for surface anomalies such as embrittlement, discoloration, or cracking. Additionally, on January 2, 2002, you have stated that FSSD cables are connected to thermocouples on the discharge of the steam relief valves (SRVs) in the drywell and provide temperature information to a recorder in the control room. You have stated that GALL Program XI.E2, "Electrical Cables Not Subject to 10 CFR 50.49 Environmental Requirements Used In Instrument Circuits" was considered to be an inappropriate activity to identify the potential aging degradation of the PVC insulation for FSSD cables. Visual inspection may not be sufficient to detect aging degradation from heat and radiation in the circuits with sensitive, low level signal. Because low-level signal circuits may operate with signals that are normally in the milliamp range or less, they can be affected by extremely low levels of leakage current. Provide a technical justification how the temperature information to a recorder in the control room will be assured when the cables are aged but do not show visual anomalies.

Peach Bottom Atomic Power Station, Units 2 and 3

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