Exelon Nuclear
200 Exelon Way
Kennett Square, PA 19348

www.exeloncorp.com

Exelon Nuclear

March 28, 2008

U. S. Nuclear Regulatory Commission
Attn: 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
Docket Nos. 50-277 and 50-278

Subject: Response to Request for Additional Information Concerning License Amendment Request – Application of Alternative Source Term

References:

1. Letter from Pamela B. Cowan, Exelon Generation Company, LLC, to U. S. Nuclear Regulatory Commission, "License Amendment Request – Application of Alternative Source Term," dated July 13, 2007

2. Letter from John D. Hughey, Project Manager, U.S. Nuclear Regulatory Commission to Charles G. Pardee, Chief Nuclear Officer and Senior Vice President, Exelon Generation Company, LLC, "Peach Bottom Atomic Power Station, Units 2 and 3 License Amendment Request for Application of Alternative Source Term," dated March 12, 2008

In Reference 1, Exelon Generation Company, LLC (Exelon) submitted an application requesting a change to the Technical Specifications (TS), Appendix A, of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively. The proposed change was requested to support the application of Alternative Source Term (AST) methodology at PBAPS, Units 2 and 3.

In Reference 2, the Nuclear Regulatory Commission (NRC) requested additional information concerning the PBAPS License Amendment Request (LAR). In particular, the NRC requested that Exelon provide additional information pertaining to Main Steam Isolation Valve (MSIV) leakage and plant ventilation issues. The attachment to this letter restates each of the NRC's questions followed by Exelon's response.

Exelon has concluded that the information provided in this response does not impact the conclusions of the: 1) Technical Analysis, 2) No Significant Hazards Consideration under the standards set forth in 10 CFR 50.92(c), or 3) Environmental Consideration as provided in the original submittal (Reference 1).

There are no regulatory commitments contained within this letter. If you have any further questions or require additional information, please contact Richard Gropp at 610-765-5557.

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 28th day of March 2008.

Respectfully,

Pamela B. Cowan
Director – Licensing and Regulatory Affairs
Exelon Generation Company, LLC

Attachment: Response to Request for Additional Information

cc:	Regional Administrator - NRC Region I	w/ Attachment
	NRC Senior Resident Inspector - PBAPS	"
	NRC Project Manager, NRR - PBAPS	"
	Director, Bureau of Radiation Protection - Pennsylvania Department of Environmental Protection	"

ATTACHMENT

Peach Bottom Atomic Power Station
Units 2 and 3
Docket Nos. 50-277 and 50-278

License Amendment Request
Response to Request for Additional Information

Alternative Source Term (AST)

Background

By letter dated July 13, 2007, Exelon Generation Company, LLC (Exelon) submitted an application requesting a change to the Technical Specifications (TS), Appendix A, of Renewed Facility Operating License Nos. DPR-44 and DPR-56 for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, respectively. The proposed change was requested to support the application of Alternative Source Term (AST) methodology at PBAPS, Units 2 and 3.

By letter dated March 12, 2008, the Nuclear Regulatory Commission (NRC) formally transmitted a Request for Additional Information and acknowledged Exelon's commitment to provide a response by March 28, 2008. The specific questions are restated below followed by Exelon's response.

NRC Question 1 (SCVB RAI 1)

In Attachment 1, Section 4.3.12, "Determination of MSIV Leak Rates in Various Steam Line Volumes," you state: "Since the actual MSIV leak rate is reduced at the accident condition due to the combined effects of compression (due to the high pressure) and expansion (due to the high temperature), the increase in the MSIV leak rates to the environment from the TSVs [turbine stop valves] are conservatively calculated using the Ideal Gas Law and drywell post-LOCA [Loss-of-Coolant-Accident] peak pressure and temperature." Please clarify the statement that actual MSIV leakage rate is reduced at the same time that the MSIV leak rates are increased.

Response

The total MSIV leakage from all main steam lines is proposed to increase to 360 scfh measured at 49.1 psig. Of this leakage, 205 scfh (at 49.1 psig) is assumed to be through the shortest steam line, which is modeled as having the failed inboard MSIV. The remaining leak rate of 155 scfh (at 49.1 psig) is assumed to be through the shortest of the three intact steam lines. The units of standard cubic feet per hour represent a MSIV leak rate value at standard temperature and pressure (STP) conditions of 68 degrees Fahrenheit (528 degrees Rankine) and 14.7 psia, respectively. The total MSIV leak of 360 scfh is converted using the ideal gas law to determine the actual leakage (cfh) using the post-LOCA peak temperature and pressure of 280 degrees Fahrenheit (740 degrees Rankine) and 49.1 psig, respectively. Applying the ideal gas law per the following equation allows one to translate the 360 scfh to an actual 116.09 cfh.

V @LOCA Conditions = (PV/T @STP) x (T/P @LOCA Conditions)
= 360 scfh x [14.7 psia / (49.1 psig + 14.7 psia)] x [740 R / 528 R]
= 360 scfh x 0.230 x 1.402 = 116.09 cfh

As evidenced in this equation, the increased MSIV leak rate of 360 scfh is equivalent to an actual "reduced" MSIV leak rate of 116 cfh that reflects a 77 percent decrease in leak rate due to the increase in pressure. This is partially offset by a 40.2 percent increase in leak rate due to the increase in temperature.

The MSIV leakage released to the environment via the steam line with the failed inboard MSIV is 66.11 cfh ([205 scfh / 360 scfh] x 116.09 cfh = 66.11 cfh). The MSIV leakage released to the environment via the shortest of the three intact steam lines is 49.98 cfh ([155 scfh / 360 scfh] x 116.09 cfh = 49.98 cfh). These "reduced" MSIV leak rates are applicable to the piping between the RPV nozzle and the outboard MSIV, because this piping experiences the post-LOCA drywell pressure and temperature conditions.

The piping between the outboard MSIV and the turbine stop valve (TSV) is exposed to atmospheric temperature and pressure conditions. Therefore, the MSIV leakages in the MSIV failed and intact lines beyond the outboard MSIV expand back to their original leak rates of 205 scfh and 155 scfh, respectively.

NRC Question 2 (SCVB RAI 2)

The Control Room Fuel Handling Accident dose is analyzed for the Turbine Building/Reactor Building Ventilation Stack Release in Attachment 1, Section 4.4.5, "Control Room Model." Please discuss the ventilation systems relied upon for the Turbine Building/Reactor Building Ventilation Stack Release with regard to their safety classification, use of emergency power, and surveillance testing. If these systems are not safety-related please justify their use as the only release pathway.

Response

A parametric study was performed to determine the sensitivity of Control Room (CR) dose with respect to the post-FHA release through the Reactor Building/Turbine Building vent stack, Reactor Building roof scuttle, and ground level hatches with different fuel decay times and modes of CR HVAC operation. It was determined that the release through the Unit 2 Reactor Building roof scuttle results in the highest CR dose (3.85 Rem TEDE) for the movement of fuel decayed for at least 24 hrs, which establishes the PBAPS licensing basis for the relaxation of the secondary containment integrity. The ground level hatches must remain closed for 84 hours. The release through the Reactor Building/Turbine Building vent stack is only used in the parametric study and the resulting CR dose (3.42 Rem TEDE) is not used to establish the PBAPS licensing basis for relaxing the SC integrity. Therefore, the Reactor Building/Turbine Building vent stack safety classification is irrelevant as it is used in the analysis.

NRC Question 3 (SCVB RAI 3)

In Attachment 2, modified Unit 2 and Unit 3 Technical Specification 3.6.4.1, "Secondary Containment," you propose adding SR 3.6.4.1.4 to verify that the secondary containment can be maintained ≥0.25 inch of vacuum water gauge for 1 hour using one Standby Gas Treatment (SGT) subsystem at a flow rate ≤10,500 cubic feet per minute (cfm). Technical Specification 5.5.7, "Ventilation Filter Testing Program," indicates that the SGT high efficiency particulate air (HEPA) filters and the SGT charcoal adsorber are both tested at a flow rate of 7200 to 8800 cfm. Please discuss this apparent discrepancy. If the intention is to downgrade the SGT HEPA filters and the

SGT charcoal adsorber, please discuss this downgrade with respect to Regulatory Guide 1.183, "Alternative Radiological Source Terms for Evaluating Design Basis Accidents at Nuclear Power Reactors," Regulatory Position 1.1.2, "Defense in Depth."

Response

Technical Specifications (TS) Surveillance Requirement (SR) 3.6.4.1.4 is not being added or revised as part of this proposed License Amendment Request (LAR) to implement AST. The noted revision bar adjacent to SR 3.6.4.1.4 in the margin on TS pages 3.6-25 for PBAPS, Units 2 and 3, is from previous licensing activities and is not applicable to the AST changes being proposed. There is no credit applied for SGT filtration in the AST analyses, although SGT unfiltered flow to the main stack is credited for some events. Although no longer credited for AST purposes, the SGT filters are being retained in TS for defense-in-depth regarding radiological releases. However, the filter testing parameters are not important for AST radiological calculation purposes.

Under this LAR, there is no intention to downgrade the SGT HEPA filters and the SGT charcoal adsorber.

The apparent discrepancy is explained as follows:

The SGT subsystem flow rate of less than or equal to 10,500 cfm specified in SR 3.6.4.1.4 is the licensed maximum flow rate of a SGT fan to prove that secondary containment can be maintained negative for a specified time under design basis environmental conditions. The primary purpose of this test is to ensure secondary containment boundary integrity. The following testing is performed as specified in TS 5.5.7, "Ventilation Filter Testing Program (VFTP)," to ensure that the SGT filter train is operable:

1. In-place testing to test the HEPA filters and charcoal adsorber filter penetration and by pass at the design flow rate range of 7200 cfm to 8800 cfm (i.e 8000 cfm ± 800 cfm). The flow rate range of 7,200 cfm to 8,800 cfm, used for in-place filter testing, relates to the design value expected during drywell purge when running a SGT fan.

2. Charcoal adsorber efficiency test to verify the methyl iodide penetration of less than 5 % using a face velocity of 60 ft/min in the laboratory settings.

3. Combined pressure drop across the HEPA filters, the prefilters and the charcoal adsorbers is less than 3.9 inches of water at the flow rate range of 7200 cfm to 8800 cfm.

As stated above, the flow rate range of 7200 cfm to 8800 cfm is the design value used for the in-place testing. The charcoal adsorber efficiency test, which is the measure of iodide removal capability, is verified using a face velocity of 60 ft/min. This face velocity value equates to a flow

rate value of 18,000 cfm, which is well in excess of the 10,500 cfm value. The 18,000 cfm relates to the maximum credible flow rate through the system. When the conversion to Improved Technical Specifications (ITS) occurred in the 1996 time period, the acceptable filter performance values were set based on 10,500 cfm flow requirements. For example, the acceptable filter differential pressure (dP) values in the VFTP were changed from 8.0 inches of water in the previous custom TS, to 3.9 inches of water in ITS based on a calculated dP that would be allowable for a total flow rate of 10,500 cfm while performing the test at 8,000 cfm.
