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10 CFR 50.90

July 29, 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. U.S. Nuclear Regulatory Commission e-mail dated July 18, 2008, draft Request for Additional Information (RAI), Peach Bottom Atomic Power Station, Units 2 and 3, License Amendment Request (LAR), Alternative Source Term Application (five questions)

3. U.S. Nuclear Regulatory Commission updated e-mail dated July 25, 2008, draft Request for Additional Information (RAI), Peach Bottom Atomic Power Station, Units 2 and 3, License Amendment Request (LAR), Alternative Source Term Application (one question)

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 References 2 and 3, the U.S. Nuclear Regulatory Commission (NRC) issued draft requests for additional information concerning the PBAPS License Amendment Request (LAR). In particular, the NRC requested that Exelon provide additional information pertaining to meteorological and dose consequences issues related to AST.

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During teleconferences on July 21, July 22, July 24, and July 25, 2008, NRC and Exelon representatives further discussed the draft RAI questions (References 2 and 3). As a result of these discussions, Exelon agreed to provide a response to four of the six questions identified in the RAI by July 29, 2008. The response to the remaining questions will be the subject of a subsequent supplemental response. The supplemental response will include changes to X/Q values, and the submittal of revised supporting calculations. As a result of the revised calculations, it is predicted that there will be some increases in the dose values. However, predicted increases will still result in acceptable doses with ample margin to the regulatory limits. Although some of the calculated doses may change, the methodologies for their determination remain the same. Attachment 1 to this letter restates each of the NRC's questions followed by Exelon's response. Attachments 2 and 3 contain revised tables (Tables A and B) and figures (Figures 1 and 2) previously submitted in the May 23, 2008, RAI 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).

This letter does include a regulatory commitment as described in Attachment 4. 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 29th day of July 2008.

Respectfully,

DPK

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

Attachment 1: Response to Request for Additional Information
Attachment 2: Revised Tables A and B
Attachment 3: Revised Figures 1 and 2
Attachment 4: List of Regulatory Commitments

cc:	Regional Administrator - NRC Region I	w/ Attachments
	NRC Senior Resident Inspector - PBAPS	"
	NRC Project Manager, NRR - PBAPS	"
	Director, Bureau of Radiation Protection - Pennsylvania Department of Environmental Protection	"
	S. T. Gray, State of Maryland	"

bcc:	P. Steinhauer, PSEG	w/o Attachments
	Senior Vice President, Mid-Atlantic Operations	"
	Site Vice President – PBAPS	"
	Plant Manager – PBAPS	"
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	Director, Engineering – KSA	"
	Director, Site Engineering – PBAPS	"
	Director, Site Training – PBAPS	"
	Manager, Regulatory Assurance – PBAPS	w/ Attachments
	Manager, Licensing	"
	J. Rommel – Manager - Engineering Safety Analysis – Cantera	"
	T. Mscisz - Engineering, KSA-2A	"
	Records Management – KSA-1N1	"

ATTACHMENT 1

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 electronic mail (e-mail) on July 18, 2008, (five questions) and an updated e-mail on July 25, 2008 (one question), the U.S. Nuclear Regulatory Commission (NRC) transmitted draft Request for Additional Information (RAI) questions pertaining to the meteorological and dose consequence issues related to AST. During teleconferences on July 21, July 22, July 24, and July 25, 2008, NRC and Exelon representatives further discussed the draft RAI questions. As a result of these discussions, Exelon agreed to provide a response to four of the six questions identified in the RAIs by July 29, 2008. The response to the remaining questions identified as AADB RAI 23 and AADB RAI 25 below will be the subject of a subsequent supplemental response. The specific questions are restated below followed by Exelon's response.

NRC Question 1 (AADB RAI 20)

Title 10 of the Code of Federal Regulations Part 50.67 (10 CFR 50.67), "Accident source term", requires that the accident source term used in dose consequence evaluations be representative of a major accident involving significant core damage, with dose consequences not exceeded by those from any accident considered credible (i.e., maximum hypothetical accident). Unlike the design basis accident (DBA) LOCA, used to evaluate the emergency core cooling system (ECCS) requirements of 10 CFR 50.46, the general scenario used to develop a maximum hypothetical, dose consequence accident source term does not represent any specific accident sequence. Rather, the maximum hypothetical accident is intended to be a surrogate to enable a deterministic evaluation of the response of a facility's engineered safety features (ESFs) such as the primary containment system. The accident analyses are intentionally conservative in order to compensate for known uncertainties in accident progression, airborne activity product transport, and atmospheric dispersion. The source term referenced in 10 CFR 50.67 is based on NUREG-1465 and is referred to as the alternative source term (AST).

The licensee determined that the dose consequence to the Control Room (CR) operator for its proposed design basis maximum hypothetical accident, which assumes that activity is not deposited in the longest inboard main steam line, is higher than assuming activity is deposited therein. This result supports the notion that the licensee's proposed design basis accident analysis is indeed more likely to be the maximum hypothetical accident, commensurate with the requirements of 10 CFR 50.67.

Exelon has analyzed a conservatively adjusted LOCA as the PBAPS design basis, and not re-determined the major accident that would result in potential dose consequences not exceeded

by those from any accident considered credible. Therefore, please submit a proposed license condition that would ensure that the conservative assumptions used in the proposed licensing basis LOCA of the LAR will be updated and retained in the PBAPS FSAR.

Response

Regulatory Guide (RG) 1.183, Section B, states that an accident source term is intended to be representative of a major accident involving significant core damage and is typically postulated to occur in conjunction with a large loss-of-coolant accident (LOCA). The design basis accidents (DBAs) were not intended to be actual event sequences, but rather, were intended to be surrogates to enable deterministic evaluation of the response of a facility's engineered safety features. The AST is not based upon a single accident scenario, but instead, it represents a spectrum of credible severe accident events. These accident analyses are intentionally conservative in order to compensate for known uncertainties in accident progression, fission product transport, and atmospheric dispersion.

RG 1.183, Section C.2.1, further indicates that the AST must be based on major accidents, hypothesized for the purposes of design analyses or consideration of possible accidental events that could result in hazards not exceeded by those from other accidents considered credible.

RG 1.183, Table 1, lists core inventory release fractions, by radionuclide groups, for the gap release and early in-vessel damage phases for DBA LOCAs for BWRs. For non-LOCA events, the fractions of the core inventory assumed to be in the damaged fuel gap for the various radionuclides are given in a separate table (Table 3). These release fractions are used in conjunction with the fission product inventory calculated with the maximum core radial peaking factor.

In consideration of the above, the AST LOCA analysis performed for the PBAPS, Units 2 and 3, considered a spectrum of line breaks and applicable source term guidance and has determined that the AST LOCA is representative of the maximum hypothetical accident (MHA). For the purpose of consideration of the MHA the LOCA analysis assumes a line break in a main steam line upstream of one inboard main steam isolation valve (MSIV) within the primary containment (drywell).

RG 1.183, Appendix A, Section 6.5 allows reduction in MSIV releases that is due to holdup and deposition in main steam piping downstream of the MSIVs if the components and piping systems used in the release path are capable of performing their safety function during and following a safe shutdown earthquake (SSE). Although a main steam line break (MSLB) in containment would not result in substantial fuel damage (per General Electric analysis described in GE Topical Report NEDO-24708A, *"Additional Information Required for NRC Staff Generic Report on Boiling Water Reactors,"* Revision 1, dated December 1980), the break in a steam line was chosen as the worst-case LOCA with the assumption of a non-mechanistic LOCA source term. This maximizes the dose since one steam line that would otherwise be available is postulated to be broken and cannot be credited for iodine deposition. The faulted steam line was chosen such that the line with the most deposition credit possible is not available for deposition, thereby maximizing the dose.

Exelon will revise the LOCA Design Analysis (i.e., Calculation PM-1077) to include the appropriate description regarding the MHA during the next revision. It is expected that the revision to Calculation PM-1077 will be completed in conjunction with providing the supplemental response to address NRC Question 4 (AADB RAI 23).

NRC Question 2 (AADB RAI 21)

Table A and Table B of the licensee supplement on May 23, 2008, shows columns representing the PBAPS MSIV leakage modeling. In the third column the heading states, "Between Inboard MSIV & TSV [turbine stop valve]." Also in the second column the heading states, "Between Inboard & Outboard MSIVs." Please explain the apparent discrepancy in these headings for Peach Bottom MSIV leakage modeling, since crediting deposition twice in piping between the inboard and outboard MSIVs would be non-conservative.

Response

The third columns in Tables A and B of the RAI response dated May 23, 2008, for "Peach Bottom AST Analysis - Parametric Study" contain a discrepancy in the heading title. These columns should be titled as "Between Outboard MSIV & TSV." The information contained in these columns is correctly applied in the design analysis and the parametric study. The revised tables are included in Attachment 2 of this submittal for clarity. As a result of the required changes to the X/Q values, the dose values are predicted to change and will be updated and included in the revision to Calculation PM-1077, which will be submitted in response AADB RAI 23.

NRC Question 3 (AADB RAI 22)

Appendix A, Section 6.1, of RG 1.183 states that "the activity available for release via MSIV leakage should be assumed to be that activity determined to be in the drywell for evaluating containment leakage (see Regulatory Position 3)." Regulatory Position 3 presents the source term, in the form of activity release fractions, released into containment. This containment source term accounts for phenomena that would serve to inhibit activity release from the vessel, prior to transport through main steam and other bypass piping. The guidance of RG 1.183 further allows for the credit of other containment removal mechanisms (i.e., natural deposition or drywell spray, for example); however, applying additional removal mechanisms, prior, and in addition, to crediting nodalized and well-mixed pipe deposition, can substantially change the containment source term assumed to traverse the bypass piping, thus rendering the containment source term of Regulatory Position 3 inapplicable. Because the cumulative effect of pre-bypass pipe removal mechanisms and each pipe node was not explicitly addressed by the containment source term provided in Regulatory Position 3, consideration should be given to the interaction of each removal mechanism with the source term of RG 1.183 when modeling the transport of activity from the drywell through bypass pathways.

Therefore, please provide information to show that the cumulative effect of assuming the release of the containment source term, natural deposition, and a constant deposition rate in successive piping nodes, for the postulated LOCA at PBAPS, does not compromise the conservative characteristics of the dose analysis.

Response

The applicable NRC guidance for the post-LOCA MSIV leakage release path in RG 1.183 and AEB 98-03 are listed in Table 1 below starting from the containment source term to atmospheric release. The post-LOCA MSIV leakage release paths are analyzed in the design analysis (PM-1077) with additional conservatisms with respect to the AEB 98-03.

Containment Source Term and Reduction of Airborne Activity:

The core isotopic activity is determined in a conservative manner in that the inventory is evaluated at two times during core life: beginning of core life (100 EFPD), and end of core life (711 EFPD). Since the accident could happen at any time, the isotopic activity at the higher of the two times was selected as the core inventory; thereby, generating a conservative core inventory. The treatment of containment source term complies with the regulatory guidance (Table 1 below, Items 1 and 2). Aerosol and elemental iodines are simultaneously removed by gravitational settling and adsorption by the wetted surface of the drywell, respectively (Table 1 below, Item 3). Additionally, the drywell airborne activity is further reduced by the containment and MSIV leakages.

Aerosol Removal By Gravitational Deposition:

Gravitational force naturally removes the airborne aerosol particles in the main steam piping during their migration through the pipe to the atmosphere. The horizontal main steam piping projected surface area provides a favorable condition for aerosol deposition. Items 4 through 9 of Table 1 below discuss the model for aerosol deposition in the main steam piping and its conformance with RG 1.183 and AEB 98-03.

A parametric study was performed using AEB 98-03 recommendations for the post-LOCA MSIV leakage path as applicable to PBAPS as described below. This study will be documented in the revision to the LOCA analysis (Calculation PM-1077), which is being performed in conjunction with providing the supplemental response to address NRC Question 4 (AADB RAI 23). A summary of the parametric study and its technical basis is described below.

1. The MSIV failed line consists of two well-mixed nodes – the main steam line volume between the inboard MSIV & outboard MSIV as well as the main steam line volume between the outboard MSIV and turbine stop valves (TSV).

2. The intact steam line consists of two well-mixed nodes – the main steam line volume between the RPV and outboard MSIV as well as the main steam line volume between the outboard MSIV and TSV.

3. The 50th percentile settling velocity and resulting aerosol removal efficiencies are used in the first node of each line. This includes the MSIV failed line well-mixed volume representing the main steam line between the inboard and outboard MSIV, as well as the well-mixed volume representing the intact main steam line between the RPV and outboard MSIV.

4. The settling velocities in the main steam lines beyond the outboard MSIVs in both release paths (failed line and intact line) are varied from the 10th percentile through the 50th percentile.

5. CR doses for the different settling velocities in the main steam piping beyond the outboard MSIV are then compared with the post-LOCA MSIV leakage pathway dose for the control room in Design Analysis PM-1077. The results of this study (to be contained in design analysis (Calculation PM-1077, Revision 1) further demonstrates that the method used in PM-1077, Revision 0 is conservative. AEB 98-03 states that the use of the 10th percentile settling velocity with a well-mixed volume is not appropriate because it does not account for many of the other removal mechanisms and added that the use of a well-mixed volume, together with median (50th percentile) settling velocity is more appropriate (AEB 98-03, page 11).

Conclusions:

Based on the parametric study performed, it is concluded that:

1. The aerosol gravitational deposition and elemental iodine removal in the post-LOCA MSIV leakage release paths are conservatively modeled in design analysis (Calculation PM-1077) such that it does not compromise the conservative characteristics of the dose analysis or the method described in AEB 98-03.

2. The MSIV leakage model is structured to provide a conservative bound for a large range of settling velocities including very fine aerosol particles represented by a lower settling velocity, lesser deposition, and higher dose as well as coarser aerosol particles represented by a higher settling velocity, larger deposition, and lower dose.

3. The conservative model used in design analysis (Calculation PM-1077) provides an appropriate and prudent safety margin against unpredicted events in the course of an accident and compensates for large uncertainties in facility parameters, accident progression, radioactive material transport, and atmospheric dispersion.

As previously indicated the results of this parametric study will be documented in more detail as an appendix to the LOCA analysis (Calculation PM-1077). The revision to Calculation PM-1077 is being completed in conjunction with providing the supplemental response to address NRC Question 4 (AADB RAI 23).

Table 1
Conservatisms in PBAPS MSIV Leakage Paths - From Containment Source Term to Atmospheric Release

Item No.	Post-LOCA Design Input	Regulatory Position	PBAPS LOCA Design Analysis PM-1077	Comments
	Containment Source Term:			
1	Core inventory release fractions, by groups, for the gap release and early in-vessel damage phases for DBA LOCA are listed in RG 1.183 Table 1 for BWRs.	RG 1.183, Position 3.2	Design Input 5.3.1.6 and RADTRAD Runs PB3D185CL.o0 & PB360MS205.o0.	Core inventory is evaluated at beginning of cycle and end of cycle. Maximum isotope values used in composite inventory for conservatism.
2	The radioactivity released from the fuel should be assumed to mix instantaneously and homogeneously throughout the free air volume of the drywell in BWRs as it is released.	RG 1.183, Appendix A, Position 3.1	Assumption 4.6.1 and RADTRAD Runs PB3D185CL.o0 & PB360MS205.o0.	
	Reduction In Airborne Activity:			
3	Reduction in airborne radioactivity in the containment by natural deposition within the containment may be credited. Acceptable models for removal of iodine and aerosols are described in Chapter 6.5.2, "Containment Spray as a Fission Product Cleanup System," of the Standard Review Plan (SRP), NUREG-0800 ([RG 1.183] Ref. A-1) and in NUREG/CR-6189	RG 1.183, Appendix A, Position 3.2	Aerosol deposition by gravitation and elemental iodine removal by containment spray are credited in AEB 98-03, Appendix C.1 for the MSIV leakage path. Aerosol deposition (Assumption 4.6.2 and Section 7.4), and elemental iodine adsorption by wetted surface (Sections 7.7 & 7.8) are credited in the PBAPS LOCA analysis and incorporated in the RADTRAD Runs PB3D185CL.o0 & PB360MS205.o0.	
	MSIV Leakage:			

Table 1
Conservatisms in PBAPS MSIV Leakage Paths - From Containment Source Term to Atmospheric Release

Item No.	Post-LOCA Design Input	Regulatory Position	PBAPS LOCA Design Analysis PM-1077	Comments
4	For the purpose of this analysis, the activity available for release via MSIV leakage should be assumed to be that activity determined to be in the drywell for evaluating containment leakage (see RG 1.183, Regulatory Position 3). No credit should be assumed for activity reduction by the steam separators or by iodine partitioning in the reactor vessel.	RG 1.183, Appendix A, Position 6.1	The activity available for release via MSIV leakage is assumed to be same as that in the drywell for evaluating containment leakage. Per Assumption 4.6.1, the activity from the reactor core is assumed to mix instantaneously and homogeneously throughout the drywell air volume without crediting any activity reduction mechanism in the reactor vessel. Please see the RADTRAD Runs PB3D185CL.o0 & PB360MS205.o0.	As stated in #1 above, additional conservatism exists in the determination of the core isotopic inventory.
5	AEB 98-03 states that use of the well-mixed model together with median (50th percentile) values for the settling velocity produces calculated doses comfortably below the acceptance limits.	AEB 98-03, page 11	Well-mixed model with 40-percentile aerosol deposition velocity is conservatively used to calculate the aerosol removal efficiencies in the MSIV failed and Intact lines (Section 7.4 and Tables 3 through 7). The aerosol distribution in the MSIV leakage path becomes insignificant at later times in the accident. Therefore the aerosol removal is conservatively not credited in the MSIV leakage paths after 96 hours (see Table 6 and RADTRAD Run PB360MS205.o0).	Use of 40th percentile aerosol deposition velocity reduces the removal rate constant substantially and conservatively increases dose.

Table 1
Conservatisms in PBAPS MSIV Leakage Paths - From Containment Source Term to Atmospheric Release

Item No.	Post-LOCA Design Input	Regulatory Position	PBAPS LOCA Design Analysis PM-1077	Comments
6	One MSIV line between the RPV & inboard MSIV is postulated to fail. No credit for aerosol deposition is taken in the failed segment of pipe.	AEB 98-03, Figure 1	The rupture of one MSIV line between the RPV and inboard MSIV is not credible due to the PBAPS plant-specific seismic design and break exclusion area consideration of the main steam lines (see discussion in Section 2.3.3). However, the concept of maximizing the dose is conservatively incorporated by not crediting aerosol deposition and elemental iodine removal in the piping from the RPV to outboard MSIV (see detailed discussion in the May 23, 2008, response to RAI AADB RAI 8 including Tables A and B and RADTRAD Run PB360MS205.o0).	Based on the comparison of the CR dose in Tables A & B of AADB RAI 8 (letter to NRC dated 05/23/08), the aerosol deposition and elemental iodine removal model for the MSIV failed line is consistent with the PBAPS plant-specific design of the main steam line and more conservative than the AEB 98-03 model.

Table 1
Conservatisms in PBAPS MSIV Leakage Paths - From Containment Source Term to Atmospheric Release

Item No.	Post-LOCA Design Input	Regulatory Position	PBAPS LOCA Design Analysis PM-1077	Comments
7	The aerosol settling velocity (removal rate) is assumed to be constant during the entire duration of accident.	AEB 98-03, Appendix C.1, MSIV Release Path Nos. 14, 15 & 16 in RADTRAD run	The LOCA analysis modeled the settling velocity constant for the entire duration of the accident for the MSIV leakage release path, which is consistent with AEB 98-03, Appendix C.1, and RADTRAD MSIV release paths # 14, 15, & 16. Unlike PBAPS, the Perry Plant does not have seismically designed main steam piping beyond the outboard MSIV. The additional well-mixed volumes are modeled to represent the piping between the outboard MSIV and TSV. For the given 40th percentile aerosol settling velocity, the aerosol removal rate is a function of the horizontal pipe surface area and piping well-mixed volume (see Equation 2 of AEB 98-03). Therefore, the use of a constant settling velocity and aerosol removal rate is appropriate and consistent with the AEB 98-03.	The post-LOCA MSIV leakage release model is consistent with AEB 98-03. See description of the parametric study performed.
8	The use of a well-mixed volume with a median (50th percentile) value of settling velocity for aerosol deposition is acceptable for the MSIV leakage paths	AEB 98-03, page 11, Paragraph 2	The aerosol removal rates in the post-LOCA MSIV leakage release paths are calculated using the 40th percentile settling velocity because (1) The lower settling velocity represents the deposition of the finer aerosol particles with a smaller aerosol density in the well-mixed volume. The gravitational removal rate of the lighter (finer) aerosol particles is substantially reduced in the lightly packed well-mixed volume. The resulting reduction in aerosol deposition removal rate constant and corresponding increase in the dose will be described in the parametric study. (2) The use of a lower settling velocity provides a conservative basis for the Staff's concern about the uncertainty associated with the gravitational deposition of the lighter aerosol particles in the well-mixed volume.	The post-LOCA MSIV leakage release model is conservative with respect to AEB 98-03.

Table 1
Conservatisms in PBAPS MSIV Leakage Paths - From Containment Source Term to Atmospheric Release

Item No.	Post-LOCA Design Input	Regulatory Position	PBAPS LOCA Design Analysis PM-1077	Comments
9	Natural removal of elemental iodine in each steam line volume is assumed to be DF of 2 or 50%.	AEB 98-03, page B-3	The elemental iodine removal in the MSIV leakage paths is assumed to be 50% from 2 min to 96 hrs. For the intact main steam line between the outboard MSIV and TSV, the elemental iodine removal is further reduced from 50% to 0.5% conservatively during 38 to 96 hrs. The elemental iodine removal in the MSIV leakage paths is conservatively not credited beyond 96 hrs.	The use of 50% elemental iodine removal efficiency in the MSIV leakage paths is conservative because the elemental iodine removal efficiency calculated based on the drywell gas maximum temperature is 56%, which greatly increases as the drywell atmosphere cools down following a LOCA.

NRC Question 4 (AADB RAI 23)

The response to NRC Question 12 (AADB RAI 12) of the licensee's May 23, 2008, letter stated that the reactor building stack tops are at 305 feet (ft) mean sea level (msl) and the meteorological Tower 2 grade elevation is 367 ft msl. NRC staff agrees that the elevation of the reactor building stack tops is nearer the height of the meteorological Tower 2 grade elevation than the grade elevation of the River Tower or Tower 1A which are approximately 116 feet msl. However, the reactor building stack tops are about 60 feet below the Tower 2 grade elevation and therefore appear to be below the top of at least part of the bluff upon which Tower 2 is located. In addition, other postulated release locations such as the personnel access door, railway bay door, and ground hatches are at or near the plant structures on the river valley shoreline and appear to be at a height more nearly that of River Tower and Tower 1A. Therefore, please provide justification that these postulated releases could not be impacted by localized air flow patterns in the valley. Further, please provide justification that use of the Tower 2 meteorological data in the PAVAN computer calculations provides the limiting atmospheric dispersion factors (χ/Q values) for the low population zone dose assessment.

Response

Exelon will: 1) recalculate the LPZ X/Qs using Tower 1A data, 2) recalculate the EAB and LPZ X/Qs using PAVAN with the finer wind speed categories. The revised calculations and updated information will be provided in a subsequent supplemental response. Since the X/Q values will be revised, it is expected that there will be some increases in dose. In addition, as a result of the changes to the X/Q values the supporting calculations for the LOCA analysis (Calculation PM-1077), Fuel Handling Accident (Calculation PM-1059), and Control Rod Drop Accident (Calculation PM-1057) will be revised and resubmitted in response to this question. However, predicted increases will still result in acceptable doses with ample margin to the regulatory limits.

NRC Question 5 (AADB RAI 24)

Figures 1 and 2 associated with the response to NRC Question 18 (AADB RAI 18) state that the Units 2 and 3 roof scuttles are at 183.5 ft (55.9 m) msl. Page 13 of Attachment 1 of the July 13, 2007 alternative source term license amendment request states that plant grade is 35.4 m. This would suggest that the roof scuttles are 20.55 m above plant grade. However, Table 3-1 of Attachment G to Calculation PM-1059 of the July 13, 2007 letter lists the release height of the roof scuttles as 48.5 m. Please provide additional information to clarify the height of the roof scuttles and justify that the value of 48.5 m input to the ARCON96 computer calculations.

Response

Pages 3 and 4 of Attachment G to Calculation PM-1059, Revision 2, of the July 13, 2007, submittal provide the derivation of the release height of the roof scuttles of 48.5 m (approximately 159 ft), as stated in Table 3-1, based on the roof scuttle height at the top of the Reactor Building of approximately 294 ft msl – 135 ft msl (west face grade) = 159 ft. It is important to note, that the correct value of 48.5 m above the west face grade was properly utilized as input to the ARCON96 computer calculations.

In response to NRC Question 18 (AADB RAI 18) in the May 23, 2008 submittal, Figures 1 and 2 were provided which included an asterisked annotation indicating that the elevation for the Unit 2 and 3 roof scuttles was 183.5 ft msl. This value is not representative of the elevation of the roof scuttles. These figures were provided to help improve reader clarity in highlighting the source and receptor locations. The information depicted on the figures was based on information from Figure 3-1 in Attachment G to Calculation PM-1077, Revision 2.

The figures have been revised to reflect the appropriate elevation for the Units 2 and 3 roof scuttles (i.e., approximately 294 ft msl). In addition, Figure 3-1 of Attachment G to Calculation PM-1059, Revision 2, will also be revised during the next revision to accurately reflect the elevation of the roof scuttles. It is expected that the revision to Calculation PM-1059 will be completed in conjunction with providing the supplemental response to address NRC Question 4 (AADB RAI 23).

NRC Question 6 (AADB RAI 25)

Updated Table 4.3-1 (LOCA Parameters) of the Enclosure to the May 23, 2008, Peach Bottom response to a request for additional information provides a set of control room atmospheric dispersion factors (X/Q values) for containment and ESF leakage releases via an off-gas stack release. Sheet 5 of Attachment A to the Enclosure provides a second set of X/Q values for releases from the off-gas stack to the control room intake that were calculated in accordance with Section 3.2.2 of Regulatory Guide 1.194. The two sets of values appear to be for a single release scenario using two different methodologies. If this is the case, please identify which set you propose to establish as the new licensing basis control room X/Q values for postulated releases from the off-gas stack.

Response

Exelon will respond to this question in conjunction with responding to NRC Question 4 (AADB 23), which will be provided in a subsequent supplemental response.

ATTACHMENT 2

Revised Tables A and B
(from May 23, 2008, RAI Response)

Revised Table A

Peach Bottom Plant-specific MSIV Leakage Model - 100% Compliance With AEB 98-03 Methodology

Variable Parameter	AEB 98-03				Peach Bottom AST Analysis - Parametric Study					
	MSIV Failed Line		Intact Line		MSIV Failed Line			Intact Line		
	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	Between Outboard MSIV & TSV	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	Between Outboard MSIV & TSV
Piping Integrity Assumed	Ruptured – not credited in analysis	Remains Intact	Remains Intact	Remains Intact	Ruptured – not credited in analysis	Remains Intact	Remains Intact	Remains Intact	Remains Intact	Remains Intact
Aerosol Deposition	Not Credited	Credited	Credited	Credited	Not Credited	Credited	Credited	Credited	Credited	Credited
Piping Volume	Not Credited	Credited	Credited	Credited	Not Credited	Credited	Credited	Credited	Credited	Credited
Holdup Time	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited
Deposition Velocity Distribution	40th Percentile				40th Percentile					
Elemental Iodine Removal	Not Credited	Credited (50%)	Credited (50%)	Credited (50%)	Not Credited	Credited (50%)	Credited (50%)	Credited (50%)	Credited (50%)	Credited (50%)
CR Dose	Not Provided				*Value not provided - to be determined in revision to Calculation PM-1077 in response to AADB RAI 23)*					

Perry plant does not have the seismically supported main steam line beyond the outboard MSIV; therefore, unlike the Peach Bottom plant, the main steam line between the outboard MSIV and TSV is not modeled.

Revised Table B

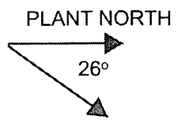
Peach Bottom Plant-specific MSIV Leakage Model Used In Licensing Basis AST LOCA Analysis

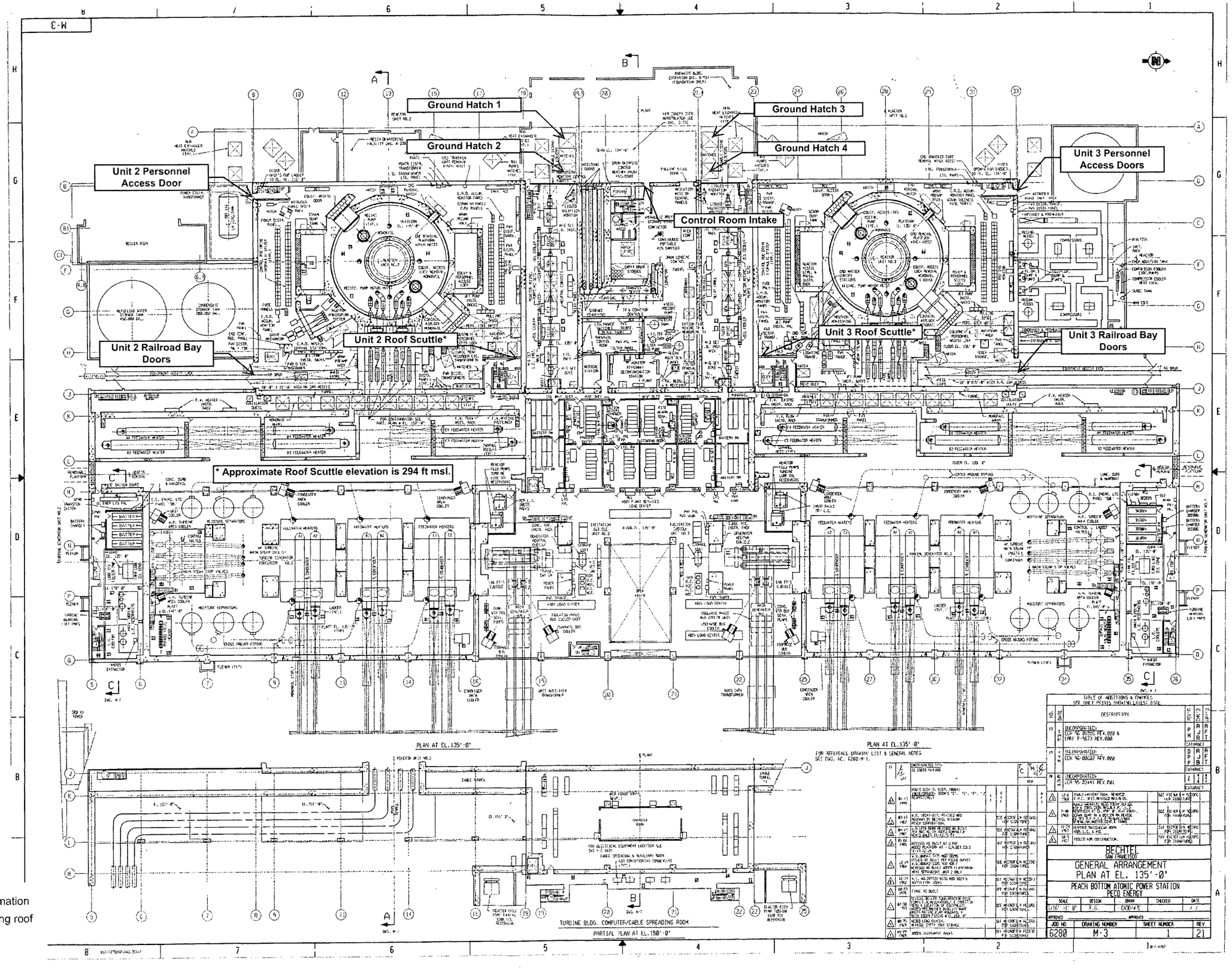
Variable Parameter	AEB 98-03				PBAPS Plant-specific Licensing Basis AST LOCA Analysis					
	MSIV Failed Line		Intact Line		MSIV Failed Line		Intact Line			
	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	Between Outboard MSIV & TSV	RPV To Inboard MSIV	Between Inboard & Outboard MSIVs	Between Outboard MSIV & TSV
Piping Integrity Assumed	Ruptured – not credited in analysis	Remains Intact	Remains Intact	Remains Intact	***Remains Intact***	Remains Intact	Remains Intact	Remains Intact	Remains Intact	Remains Intact
Aerosol Deposition	Not Credited	Credited	Credited	Credited	Not Credited	***Not Credited***	Credited	Credited	Credited	Credited
Piping Volume	Not Credited	Credited	Credited	Credited	***Credited***	Credited	Credited	Credited	Credited	Credited
Holdup Time	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited	Not Credited
Deposition Velocity Distribution	40th Percentile				40th Percentile					
Elemental Iodine Removal	Not Credited	Credited (50%)	Credited (50%)	Credited (50%)	Not Credited	***Not Credited***	Credited (50%)	Credited (50%)	Credited (50%)	Credited (50%)
CR Dose	Not Provided				***4.36 Rem TEDE per PM-1077, Rev.0 as provided in the May 23, 2008, RAI response (to be updated in conjunction with revision to Calculation PM-1077 in response to AADB RAI 23)***					

Peach Bottom licensing basis AST LOCA analysis in effect assumes the rupture of a main steam line between the RPV nozzle and the inboard MSIV in terms of removing any credit for the deposition of aerosol and removal of elemental iodine in that line and also in the portion of that main steam line between the inboard and outboard MSIV. This produces additional dose margin to the CR operator and proves that the PBAPS MSIV leakage model is conservative in comparison the AEB 98-03 MSIV leakage model.

ATTACHMENT 3

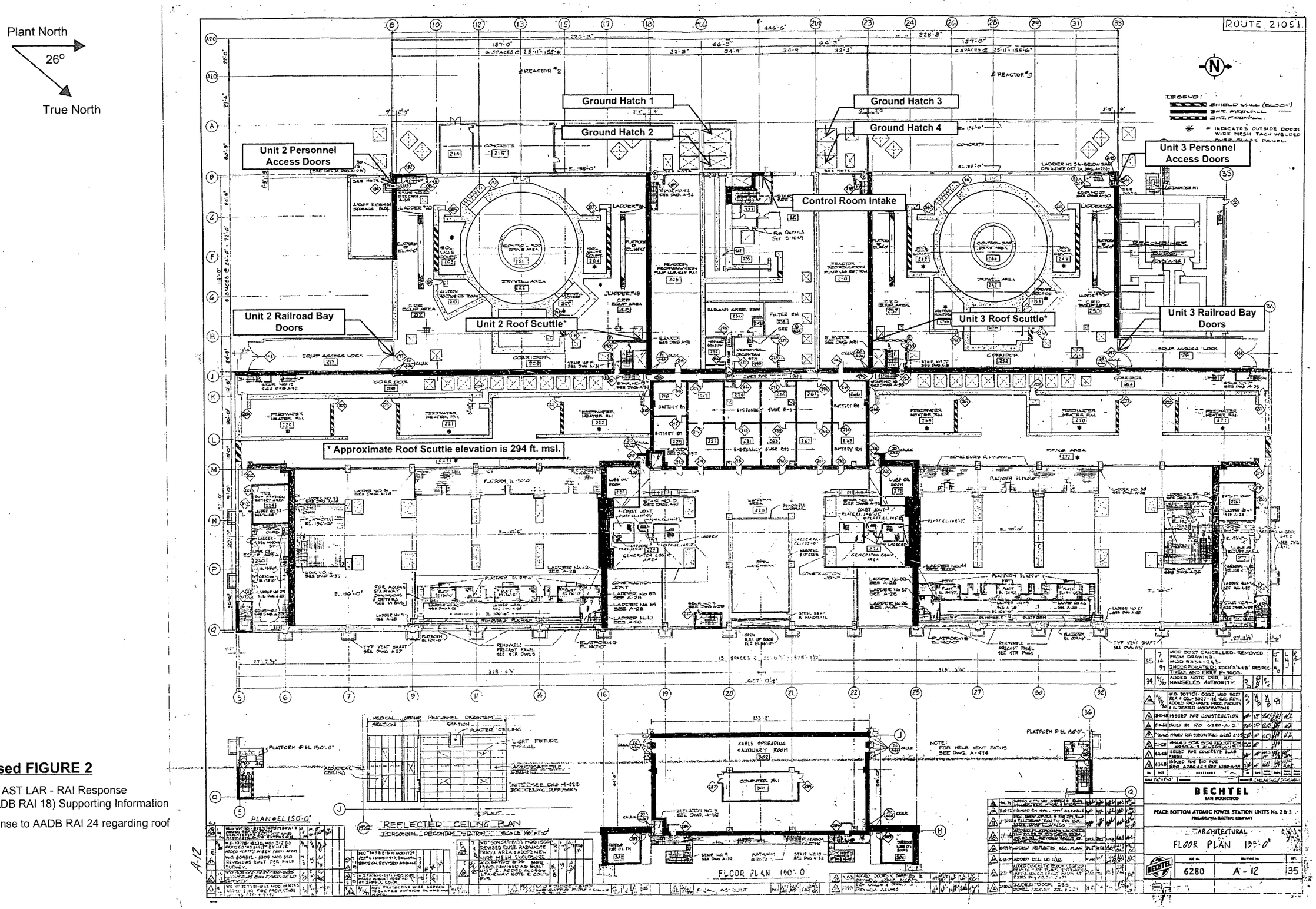
Revised Figures 1 and 2
(from May 23, 2008, RAI Response)





Revised FIGURE 1

PBAPS AST LAR - RAI Response
Question 18 (AADB RAI 18) Supporting Information
Revised in response to AADB RAI 24 regarding roof scuttle elevation.



Revised FIGURE 2

PBAPS AST LAR - RAI Response
Question 18 (AADB RAI 18) Supporting Information

Revised in response to AADB RAI 24 regarding roof scuttle elevation.

ATTACHMENT 4

List of Regulatory Commitments

Attachment 4

LIST OF COMMITMENTS

The following table identifies those actions committed to by Exelon Generation Company (Exelon), LLC, in this document. Any other statements in this submittal are provided for information purposes and are not considered to be commitments.

COMMITMENT	COMMITTED DATE OR "OUTAGE"	COMMITMENT TYPE	
		ONE-TIME ACTION (Yes/No)	PROGRAMMATIC (Yes/No)
The design basis documentation for Peach Bottom Atomic Power Station (PBAPS), Units 2 and 3, will include the appropriate description regarding the maximum hypothetical accident (MHA) during the next revision. For the purpose of consideration of the MHA the LOCA analysis assumes a line break in a main steam line upstream of one inboard main steam isolation valve (MSIV) within the primary containment (drywell).	Prior to implementation of the Approved License Amendment	No	Yes