



ND-2011-0017
April 8, 2011

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

Subject: **PSEG Early Site Permit Application**
Docket No. 52-043
Response to Request for Additional Information, RAI No. 15, Vertical
Temperature Difference Used to Determine Atmospheric Stability
Class

- References:
- 1) PSEG Power, LLC letter to USNRC, Application for Early Site Permit for the PSEG Site, dated May 25, 2010
 - 2) RAI No. 15 (eRAI 5485), SRP Section: 02.03.02 – Local Meteorology, dated March 11, 2011

The purpose of this letter is to respond to the request for additional information (RAI) identified in Reference 2 above. This RAI addresses Local Meteorology, as described in Section 2.3.2 of the Site Safety Analysis Report (SSAR), as submitted in Part 2 of the PSEG Site Early Site Permit Application, Revision 0.

Enclosure 1 provides our response for RAI No. 15, Question No. 02.03.02-1. Our response to RAI No. 15, Question No. 02.03.02-1 will result in a revision to the SSAR. Enclosure 2 includes the proposed revision to the SSAR. Enclosure 3 includes the new regulatory commitment established in this submittal.

If any additional information is needed, please contact David Robillard, PSEG Nuclear Development Licensing Engineer, at (856) 339-7914.

DOT9
NRO

I declare under penalty of perjury that the foregoing is true and correct. Executed on the 8th day of April, 2011.

Sincerely,



James Mallon
Nuclear Development
Early Site Permit Manager
PSEG Power, LLC

- Enclosure 1: Response to NRC Request for Additional Information, RAI No. 15, Question No. 02.03.02-1, SRP Section: 02.03.02 – Local Meteorology
- Enclosure 2: Proposed Revisions Part 2 – Site Safety Analysis Report (SSAR) Section 2.3.2, Local Meteorology

cc: USNRC Project Manager, Division of New Reactor Licensing, PSEG Site (w/enclosures)
USNRC Environmental Project Manager, Division of Site and Environmental Reviews (w/enclosures)
USNRC Region I, Regional Administrator (w/enclosures)

PSEG Letter ND-2011-0017, dated April 8, 2011

ENCLOSURE 1

RESPONSE to RAI No. 15

QUESTION No. 02.03.02-1

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Response to RAI No. 15, Question 02.03.02-1:

In Reference 2, the NRC staff asked PSEG for information regarding Local Meteorology, as described in Section 2.3.2 of the Site Safety Analysis Report. The specific request was:

10CFR 52.17(a) requires that the application contain a description of the seismic, meteorological, hydrological, and geological characteristics of the proposed site. NUREG-0800, Section 2.3.2 provides guidance on how to meet the relevant requirements of the NRC's regulations for the review of local meteorology. Regulatory Guide 1.23, Revision 1 states that vertical temperature difference (ΔT) should be measured on the same open-lattice tower or mast as wind speed and wind direction between the 10-meter (33-foot) level and 60-meter (197-foot) levels and, if necessary, between the 10-meter (33-foot) level and a higher level that is representative of diffusion conditions from release points that are 85 meters (279 feet) or higher.

PSEG ESP application SSAR Section 2.3.2.2 states that atmospheric stability class was based on the onsite meteorological tower 150-33 ft (45-10 m) ΔT .

- 1. Please explain in the PSEG ESP Application SSAR why the stability classes were determined by using the temperature difference between the 45 meter and 10 meter observation levels, instead of the difference between the 90 meter and 10 meter observation levels.*
- 2. Explain how this change to the stability class calculations may affect the χ/Q values presented in SSAR Sections 2.3.4 and 2.3.5.*

PSEG Response to NRC RAI:

1. Regulatory Guide 1.23, Revision 1, states that delta-T should be measured between the 10 meter (m) (33 foot (ft)) and 60 m (197 ft) levels, and, if necessary, between the 10 m (33 ft) and a higher level that is representative of diffusion conditions from release points that are 85 m (279 ft) or higher.

For the reactor technologies used to develop the Plant Parameter Envelope (PPE), Unit Vent/Airborne Release Point Elevation is considered Ground Level as shown in PPE items 9.4.2 and 9.4.3 of Table 1.3-1 of the SSAR. Therefore, short term and long term diffusion estimates treat those emissions as ground level releases.

The on-site meteorological tower includes delta-T measurements between 300 ft – 33 ft, and between 150 ft – 33 ft. Comprehensive data are available from the 150 ft – 33 ft instrumentation for the three year period January 1, 2006 through December 31, 2008.

The delta-T values used to determine stability classes for use in diffusion estimates of χ/Q values are determined using a 150 ft – 33 ft delta-T. The use of these values is appropriate for this application for the following reasons:

- The instrumentation is mounted on a tower that is at a location that is compliant with Regulatory Guide 1.23, Revision 1
- The 150 ft – 33 ft delta-T instrumentation accuracy is compliant with Regulatory Guide 1.23 Revision 1
- The instrument more closely represents the atmospheric layer closest to the ground, therefore the instrument elevation is consistent with the PPE ground level release point
- The instrument vertical height difference of 117 ft (35 m) is close to the 50 m vertical height difference specified in Regulatory Guide 1.23, Revision 1
- The 150 ft – 33 ft delta-T measurements and 33 ft wind speed and direction measurements are available during the three year period January 1, 2006 through December 31, 2008. Those measurements meet the measurement period length recommendations of Regulatory Guide 1.23, Revision 1 for an early site permit application. The 150 ft – 33 ft delta-T measurements, and the joint delta-T, 33 ft wind speed and wind direction measurements meet the 90% recovery requirement of Regulatory Guide 1.23, Revision 1.

In summary, the 150 ft – 33 ft instrument best represents the layer into which the ground level releases will be emitted, complies with regulatory requirements, and provides the most appropriate input for diffusion estimates.

A short section of additional text will be added to SSAR Section 2.3.2.2.2 clarifying how the delta-T values measured and used for diffusion estimates comply with regulatory guidance and are the most appropriate to be used for that purpose.

2. The delta-T values used for diffusion estimates are consistent with the Regulatory Guide 1.23 guidance and the 150 ft – 33 ft instrumentation measurements best represent the layer into which the ground level releases will be emitted. Since the 150 – 33 ft instrumentation provides the most appropriate input for determining the diffusion estimates there is no change in the stability class calculations.

Associated PSEG Site ESP Application Revisions:

Text will be added to SSAR Section 2.3.2 Local Meteorology to provide additional clarification.

Enclosure 2 includes a markup of the proposed SSAR revision.

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**ENCLOSURE 2
Proposed Revisions
Part 2 – Site Safety Analysis Report (SSAR)
Section 2.3.2 – Local Meteorology**

**Marked-up Page
2.3-31**

**PSEG Site
ESP Application
Part 2, Site Safety Analysis Report**

wind directions ranging from north through north-northwest. Each of those wind directions spans a 22.5 degree upwind sector.

RAI No. 15, Question 02.03.02-1
Insert A

2.3.2.2.2 Atmospheric Stability

Table 2.3-26 presents a comparison of annual mean Pasquill stability class frequency distributions based on three year (2006 to 2008) and 32 year (1977 to 2008) on-site meteorological data. Stability data are based on primary tower 150-33 ft. delta-T.

Comparison indicates that the three and 32-year distributions are very similar. That result provides additional support for the conclusion that the three years of data used for χ/Q and radiological dose calculations are representative of longer term climatological conditions at the PSEG Site.

Table 2.3-27 presents annual mean JFDs of wind direction and wind speed versus Pasquill atmospheric stability class for the three year period 2006 to 2008. Stability class is based on the S/HC on-site primary meteorological tower 150-33 ft. delta-T, and winds are based on 33 ft. level measurements.

Statistics in Tables 2.3-26 and 2.3-27 show that E (slightly stable) stability class is most frequent at the site, occurring 34 percent of the time. Class D (neutral) is next most frequent, at 26 percent of the time. Class G (extremely stable), which is associated with the highest estimated χ/Q for the new plant ground level release, occurs 7 percent of the time.

2.3.2.2.3 Temperature

Extreme temperatures at the PSEG Site and in its climatic vicinity are described in Subsection 2.3.1.5, based on statistics from the 10 representative regional COOP monitoring stations: Dover, Millington 1 SE, Wilmington, Marcus Hook, Philadelphia IAP, Hammonton 1 NE, Glassboro 2 NE, Woodstown Pittsgrove 4 E, Seabrook Farms, and Millville MAP. Those statistics indicate that extreme temperatures in the region that includes the site and its surrounding climate area range from 108°F (at Marcus Hook, Pennsylvania) to -15°F (at Millington 1 SE, New Jersey). Mean temperatures are described in Subsection 2.3.2.2. Those statistics indicate that mean conditions are relatively homogeneous across the region that includes the site and the climate area that surrounds it. The mean annual temperature ranges from 56.8°F at Dover, Delaware to 53.9°F at Hammonton 1 NE, New Jersey.

2.3.2.2.4 Water Vapor

NOAA publishes LCD summaries for standard first-order weather monitoring stations. Those summaries provide water vapor statistics, including wet bulb temperature, dew point temperature, and relative humidity. Water vapor statistics from the LCD summary for a single representative regional station first-order station is sufficient to define mean water vapor conditions for the PSEG Site climate region. Wilmington is the closest such station. The only other such station within the PSEG Site climate region is Philadelphia, which is more distant than Wilmington, and is eliminated from consideration for mean water vapor data for that reason.

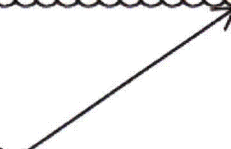
For the reactor technologies used to develop the Plant Parameter Envelope, Unit Vent/Airborne Release Point Elevation is considered Ground Level as shown in PPE items 9.4.2 and 9.4.3 of Table 1.3-1 of the SSAR. Therefore, short term and long term diffusion estimates treat those emissions as ground level releases.

The on-site meteorological tower includes delta-T measurements between 300 ft – 33 ft, and between 150 ft – 33 ft. Comprehensive data are available from the 150 ft – 33 ft instrumentation for the three year period January 1, 2006 through December 31, 2008.

The delta-T values used to determine stability classes for use in diffusion estimates of χ/Q values are determined using a 150 ft – 33 ft delta-T. The use of these values is appropriate for this application for the following reasons: the instrument more closely represents the atmospheric layer closest to the ground, therefore the instrument elevation is consistent with the plant parameter envelope ground level release point; and the instrument vertical height difference of 117 ft (35 m) is close to the 50 m vertical height difference specified in Regulatory Guide 1.23, Revision 1.

In summary, the 150 ft – 33 ft instrumentation measurements best represent the layer into which the ground level releases will be emitted, comply with regulatory requirements, and provide the most appropriate input for diffusion estimates.

RAI No. 15, Question 02.03.02-1
Insert A



PSEG Letter ND-2011-0017, dated April 8, 2011

ENCLOSURE 3
Summary of Regulatory Commitments

ENCLOSURE 3

SUMMARY OF REGULATORY COMMITMENTS

The following table identifies commitments made in this document. (Any other actions discussed in the submittal represent intended or planned actions. They are described to the NRC for the NRC's information and are not regulatory commitments.)

COMMITMENT	COMMITTED DATE	COMMITMENT TYPE	
		ONE-TIME ACTION (YES/NO)	PROGRAMMATIC (YES/NO)
PSEG will revise SSAR Section 2.3.2 to incorporate the changes in Enclosure 2 in response to NRC RAI # 15	This revision will be included in the next update of the PSEG Site ESP Application SSAR.	Yes	No