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April 29, 2014

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Subject: Peach Bottom Atomic Power Station, Units 2 and 3

Independent Spent Fuel Storage Installation (ISFSI)
Facility Operating License DPR-12, DPR-44 and DPR-56
NRC Docket 50-171, 50-277 and 50-278 and ISFSI Docket 72-29

Annual Radioactive Effluent Release Report 56
January 1, 2013 through December 31, 2013

Enclosed is the Annual Radioactive Effluent Release Report 56, January 1, 2013 through December 31, 2013 for Peach Bottom Atomic Power Station, Units 2 and 3.

This report is being submitted in compliance with 10 CFR 50.36a(2) and the Technical Specifications of Operating Licenses DPR-44 and DPR-56 and to fulfill the requirements of Offsite Dose Calculation Manual Specification (ODCMS) 3.10.2. Additionally, this report is submitted to satisfy the annual effluent reporting requirements for the ISFSI required by the ODCM.

There were no revisions to the ODCM in the 2013 reporting period.

There are no commitments contained in this letter.

If you have any questions or require additional information, please do not hesitate to contact us.

Sincerely,

Patrick Navin,
Plant Manager, Peach Bottom Atomic Power Station

PDN/PL/GRS/EAS/eas

Enclosure (1)

cc: USNRC Region I, Regional Administrator (William Dean)
USNRC Senior Resident Inspector, PBAPS (Sam Hansell)
USNRC Region I Inspector, Joe Furia

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U.S. Nuclear Regulatory Commission
Annual Radioactive Effluent Release Report 55
January 1, 2013 through December 31, 2013

bcc: P. Steinhauer, PSEG [patricia.steinhauer@pseg.com]
S. Grey, State of Maryland [SGrey@dnr.state.md.us]
R. R. Janati, Commonwealth of Pennsylvania [rjanati@state.pa.us]
C. Mudrick, Kennett Square
M. Massaro, PBAPS SMB4
P. Navin, PBAPS, A4-1S
T. Moore, PBAPS SMB3-2A
R. Reiner, Jr. PBAPS PB-TC
M. Jesse, Kennett Square
J. Armstrong, PBAPS, SMB4
R. Salvador, PBAPS SMB
D. P. Helker, Kennett Square
W. R. Nelle, PBAPS
Records Management SRRS ID 2C.111

PEACH BOTTOM ATOMIC POWER STATION
Unit Numbers 2 and 3
Docket Numbers 50-277 and 50-278
Unit Number 1
Docket Number 50-171
PBAPS Independent Spent Fuel Storage Installation
Docket Number 72-29

RADIOACTIVE EFFLUENT RELEASE REPORT

NO. 56

JANUARY 1, 2013 THROUGH DECEMBER 31, 2013

Submitted to
The United States Nuclear Regulatory Commission
Pursuant to
Facility Operating Licenses DPR-44 and DPR-56

**Peach Bottom Atomic Power Station
Unit 2 and 3**

**Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC**

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Technical Concurrence (for accuracy of information):



Chemistry, Environmental and Radioactive Waste Manager

15APR14
Date

Introduction

In accordance with the Reporting Requirements of Technical Specification 5.6.3 applicable during the reporting period, this report summarizes the Effluent Release Data for Peach Bottom Atomic Power Station (PBAPS) Units 2 and 3 for the period January 1, 2013 through December 31, 2013. The notations E+ and E- are used to denote positive and negative exponents to the base 10, respectively.

The release of radioactive materials during the reporting period was within the Offsite Dose Calculation Manual Specification (ODCMS) limits.

There were two (2) unplanned releases of liquid radioactive material. One release was from Residual Heat Removal (RHR) heat exchanger and the other is from groundwater tritium contamination ('tritium plume').

There was one (1) unplanned release of gaseous radioactive material during the Unit 3 19th Refueling Outage on September 28, 2013. This was due to a slight positive pressure in the Reactor Building while hatches were open to support Unit 3 outage work activities. Details of this release are included in this report.

The maximum calculated organ dose (bone) from iodines (I-131, I-133 and I-135), tritium (H-3), carbon-14 (C-14) and particulates to any individual due to gaseous effluents was 5.49E-01 mrem, which was approximately 1.83E+00% of the annual limit. The maximum calculated air dose in the UNRESTRICTED Area due to noble gas effluents was 2.33E-01 mrad (gamma) and 1.60E-01 mrad (beta), which was 1.16E+00% and 3.99E-01%, respectively, of the annual limits.

There were no gaseous or liquid radioactive releases from the decommissioned Unit 1 in SAFSTOR¹ status. All radioactive water that collected in spaces inside was removed and was transferred from the Unit 1 Radioactive Material License to the Unit 2 and 3 Operating License to be processed through the normal radioactive waste processing systems.

Routine sampling of the sediment of the Susquehanna River (Conowingo Pond) had one (1) sample with low-level of cesium-137 (Cs-137) indicated (Station 4T). This sample assumed that this concentration, 2.41E+00 pCi/ kg, existed all year long for dose projection to a member of the public. The maximum receptor was found to be the teenage skin at 6.33E-04 mrem with a teenage whole-body dose of 5.43E-04 mrem. These doses were 3E-03% and 9E-03% of the 10 CFR 50, Appendix I limits respectively. These radiation exposures were found to be far-below

¹ SAFSTOR is "[a] method of decommissioning in which a nuclear facility is placed and maintained in a condition that allows the facility to be safely stored and subsequently decontaminated (deferred decontamination) to levels that permit release for unrestricted use", <http://www.nrc.gov/reading-rm/basic-ref/glossary/safstor.html>, accessed 7 APR 2014.

ODCMS limits. Typically, Cs-137 found in the environment is attributed to atmospheric nuclear weapons testing especially due to the absence of other shorter half-life nuclides that would indicate more-recent production from a nuclear reactor. It is not known if this is also attributable to the Fukushima Daiichi accident releases.

There were no gaseous or liquid radioactive releases from the Independent Spent Fuel Storage Installation, NRC Docket No. 72-29 (ISFSI).

There were no changes made to RW-AA-100 "Process Control Program for Radioactive Waste" in 2013.

Particulate gamma activity (particulates) and radioactive iodine (iodines) activity released in 2007 and 2008 were found to be reported to be higher than actual. The corrected values and associated dose calculations are provided in the Errata Data section of this report. (Appendix A).

Clarifications to accounting of Unit 1 Radioactive Waster transferred and released off-site were performed and included in the Errata Data section as well. (Appendix A).

There were no changes made to the ODCM during the 2013 reporting period.

Exelon Nuclear common procedures, which provide consistent expectations and standards for Radioactive Effluents Controls Program (RECP), were used to generate this report. They are:

- CY-AA-170-000, Radioactive Effluent and Environmental Monitoring Program
- CY-AA-170-100, Radiological Environmental Monitoring Program
- CY-AA-170-200, Radioactive Effluent Controls Program
- CY-AA-170-300, Offsite Dose Calculation Manual Administration
- CY-AA-170-2000, Annual Radioactive Effluent Release Report
- CY-AA-170-2100, Estimated Errors of Effluent Measurement
- CY-AA-170-3100, Offsite Dose Calculation Manual Revisions

Peach Bottom Atomic Power Station
Unit 2 and 3

Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC

Attachment 1: Supplemental Information

Regulatory Limits

Table 1. Noble Gas Dose Rate and Dose Limits

Maximum Value	Units	Limit Classification	Specification
500	mrem/ y	annual total body dose rate	ODCM Specification 3.8.C.1.a
3000	mrem/ y	annual skin dose rate	ODCM Specification 3.8.C.1.a
10	mrads	gamma radiation air dose per quarter	ODCM Specification 3.8.C.2.a
20	mrads	beta radiation in air dose per quarter	ODCM Specification 3.8.C.2.b
20	mrads	gamma radiation in air dose per year	ODCM Specification 3.8.C.2.c
40	mrads	beta radiation in air dose per year	ODCM Specification 3.8.C.2.d

Table 2. Iodines, Tritium and Particulates (with half-lives > 8 days) Dose Rate and Dose Limits

Maximum Value	Units	Limit Classification	Specification
1500	mrem/ y	annual dose rate limit to any organ	ODCM Specification 3.8.C.1.b
15	mrem	annual dose limit to any organ per quarter	ODCM Specification 3.8.C.3.b
30	mrem	dose limit to any organ per year	ODCM Specification 3.8.C.3.b

Table 3. Liquid Effluent Activity Concentration and Dose Rate Limits

Maximum Value	Units	Limit Classification	Specification
≤ 10 times 10 CFR 20, Appendix B, Table 2, Column 2	μCi/ mL	Activity Concentration in all liquid releases	ODCM Specification 3.8.B.1.a
2E-04	μCi/ mL	total activity concentration for all dissolved and entrained noble gases	ODCM Specification 3.8.B.1.b
3.0	mrem	total body dose limit per quarter	ODCM Specification 3.8.B.2.a
10	mrem	total body dose limit per year	ODCM Specification 3.8.B.2.a
6.0	mrem	dose limit per quarter to any organ	ODCM Specification 3.8.B.2.b
20	mrem	dose limit per year to any organ	ODCM Specification 3.8.B.2.b

Maximum Permissible Concentrations

Gaseous dose rates, rather than effluent concentrations, are used to calculate permissible release rates for gaseous releases. The maximum permissible dose rates for gaseous releases are defined in ODCMS 3.8.C.1.a and 3.8.C.1.b.

The Effluent Concentrations Limits (ECL) specified in 10 CFR 20, Appendix B, Table 2, Column 2 and multiplied by 10, for identified nuclides, are used to calculate permissible release rates and concentrations for liquid release per ODCMS 3.8.B.1.

The total activity concentration for all dissolved or entrained noble gases is limited to ≤ 2E-04 μCi/ mL (ODCMS 3.8.B.1.b).

Average Energy

The PBAPS ODCM limits the dose-equivalent rates due to the release of noble gases to less than or equal to 500 mrem/ year to the total body and less than or equal to 3000 mrem/ year to the skin. Therefore, the average beta and gamma energies of the radionuclide mixture in releases of fission and activation gases as described in Regulatory Guide 1.21, Revision 1, "Measuring, Evaluation, and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water-Cooled Nuclear Power Plants," are not applicable to PBAPS.

Measures and Approximations of Total Radioactivity

Fission and Activation Gases

The method used for gamma isotopic analysis is the Canberra Genie System with a gas Marinelli beaker. Grab samples are taken and analyzed weekly to determine the isotopic mixture of noble gas activity released for the week. Airborne effluent gaseous activity was continuously monitored and recorded in accordance with ODCMS Table 4.8.C.1. The data from the noble gas radiation monitor were analyzed to report noble gas effluent activities. When no activity was identified in the grab isotopic analysis, the entire release must be assumed to be the radionuclide most-limiting dose factors for the release pathway (i.e. krypton-88 (Kr-88) for all ground-level releases, Kr-88 for elevated gamma dose and Kr-87 for elevated beta dose; see NUREG-0133²).

The activity released is listed as "unidentified" in the Attachment 2 Tables. If activity was found in the grab isotopic analysis, the isotopic mixture for the Noble Gas Monitor was determined from that isotopic mixture.

Iodines

The method used is the Canberra Genie System with a charcoal cartridge. Iodine activity was continuously sampled and analyzed in accordance with ODCMS Table 4.8.C.1.

Particulates

The method used is the Canberra Genie System with a particulate filter (47 mm diameter). Particulate activity was continuously sampled and analyzed in accordance with ODCM Table 4.8.C.1.

Composite particulate air samples were submitted to an offsite vendor laboratory for analyses of strontium-89 (Sr-89), strontium-90 (Sr-90) and gross alpha.

Carbon-14

The amount of C-14 released was estimated using the guidance from the Electric Power Research Institute (EPRI) Technical Report 1021106, "Estimation of Carbon-14 in Nuclear Power Plant Gaseous Effluents". The C-14 was released primarily through the stack (9.7E+01%) with a small amount (3.00E+00%) through the plant vents. The C-14 in liquid effluents is not a significant dose pathway, as determined from studies. The resulting annual dose to the maximum hypothetical receptor is 5.49E-01 mrem, with the limiting receptor as the child bone.

Liquid Effluents

Gamma isotopic activity concentrations are determined on each batch of liquid effluent prior to release using the Canberra Genie System in accordance with ODCMS Table 4.8.B.1. The total

² <http://www.nrc.gov/reading-rm/doc-collections/nuregs/staff/sr0133/sr0133.pdf>, accessed 9 April 2014.

activity of a released batch is determined by multiplying each nuclide's concentration by the total volume discharged.

Composite liquid radwaste samples are analyzed for tritium on-site and submitted to an offsite vendor laboratory for analyses of iron-55 (Fe-55), phosphorus-32 (P-32), Sr-89, Sr-90 and gross alpha.

Decommissioned Unit 1 Liquid Radioactive Waste Processing

In 2013, a total of 1.66E+02 gallons of low-level radioactive water were transferred from the decommissioned and defueled Unit 1 facility, and added to the 8.00E+01 gallons carried forward from 2012, to the Unit 2 and 3 Liquid Radioactive Waste system for processing prior to release. Of this total amount transferred (2.46E+02 gallons), only 1.73E+02 gallons were released which contained a total tritium (H-3) activity of 2.10E+03 μ Ci.

A dose assessment of this release using the NRCDOSE LADTAP code shows that the hypothetical maximum receptor for this tritium is the child with 5.41E-10 mrem for the entire year (drinking water pathway and fish consumption). This dose is far below limits.

Estimate of Total Error Present

CY-AA-170-2100, "Estimated Errors of Effluent Measurements", provides the methodology to obtain an overall estimate of the error associated with radioactive effluents.

Batch Releases

Table 4. Quarterly Liquid Batch Release Statistics

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Number of Batch Releases	2	13	20	4
Total Time for Batch Releases (minutes)	1.45E+02	1.28E+03	4.79E+03	4.10E+02
Maximum time period for batch release (minutes)	7.50E+01	2.70E+02	3.18E+02	1.30E+02
Average time period for batch release (minutes)	7.25E+01	9.82E+01	2.39E+02	1.03E+02
Minimum time period for batch release (minutes)	7.00E+01	1.00E+00	3.00E+01	8.00E+01
Average Stream Flow ^{3, 4}	4.83E+04	3.75E+04	2.11E+04	2.65E+04 ⁵
Dilution volume (liters)	6.16E+11	6.74E+11	6.59E+11	5.76E+11

Table 5. Quarterly Gaseous Batch Release Statistics

	First Quarter	Second Quarter	Third Quarter	Fourth Quarter
Number of batch releases:	0	0	1	0
Total Time for batch releases (minutes)	N/A	N/A	300	N/A
Maximum time period for batch release (minutes):	N/A	N/A	300	N/A
Average time period for batch release (minutes)	N/A	N/A	300	N/A
Minimum time period for batch release (minutes)	N/A	N/A	300	N/A

Average Stream Flow

The river flow is not used for dose calculations. The actual flow rate of Circulation Water (the water that is circulated within the plant for cooling) is determined for each liquid effluent

³ Average Stream Flow is not used for dose calculation.

⁴ Source: USGS National Water Information System, Site Name: "Susquehanna River at Marietta, PA", Site Number: 01576000. Data accessed 20 March 2014.

⁵ Official USGS data were not available for 4th Quarter. Averages obtained from manual calculations.

release because this Circulation Water provides dilution and therefore reduces the projected dose.

Abnormal or Unplanned Releases

'Abnormal' releases are those releases that are not defined as 'normal' releases in the Licensee's ODCM. While attempts are made to ensure radioactivity is not released offsite without processing, monitoring of systems with a potential for release is continuously performed. Source terms used for dose calculations utilize direct sampling and the maximum concentrations of nuclides to ensure that the most conservative and bounding estimates are used.

Therefore, reported doses for these abnormal releases are much larger than would be actually experienced.

Liquid Releases

Groundwater Tritium Plume

During 2013, during the sampling and analysis of the Radiological Ground Water Protection Program (RGPP), tritium was measured at several locations around the site. The ground water that has detectable tritium has been determined to be discharged into the intake or discharge canal. Details of this program can be found in the Peach Bottom Annual Radiological Environmental Operating Report as an appendix.

Analysis of Release

It was estimated that the ground water flowed to the discharge canal at a steady rate of 175 gpm. With the concentration ranging from $4.16E-06 \mu\text{Ci}/\text{mL}$ to $9.64E-06 \mu\text{Ci}/\text{mL}$, the ground water released to the discharge canal was responsible for a hypothetical maximum $1.79E-05$ mrem total body dose and critical organ dose (child liver)⁶ for the year. This dose contribution projection is well below the limit specified in the ODCM.

The tritium concentration is decreasing over time demonstrating that the RGPP at Peach Bottom is effective at locating potential leaks and correcting them. Surveillance of this program is ongoing.

Heat Exchanger Leakage

Throughout the 2013 calendar year, small leaks were discovered in a few of the Unit 2 and Unit 3 Residual Heat Removal (RHR) Heat Exchangers, which are designed to circulate water to remove heat from their respective reactor units when necessary. Because the internals are contaminated, small amounts of radioactivity could be released to the environment. Radiation monitoring instrumentation is installed to continuously monitor for an inadvertent release of

⁶ The numerical values for dose are identical because the ingestion dose factors for all organs (except bone) are identical for the child in the liquid pathway.

radioactive material should the heat exchanger develop a large leak with a large amount of radioactivity. When the system is not operated, the contaminated-side of the heat exchanger is at a lower pressure than that of the uncontaminated or 'river' side. Therefore, for small leaks, river water normally leaks into the 'plant' side. However, for conservatism, Peach Bottom calculates the effect as if there was a steady leakage outward using data from samples taken of systems in communication with the 'plant' side of the heat exchanger to create an upper bound of the activity source term.

Analysis of Release

It was estimated that the contaminated water released to the discharge canal for all of 2013 was responsible for $1.16E-06$ mrem total body dose (for the hypothetical maximum receptor child), and $3.33E-06$ mrem for the hypothetical maximum organ, child liver, dose. This dose contribution was well below the limits specified in the ODCM.

Samples were analyzed for all the parameters of radioactive effluent releases. Composite liquid radwaste samples counted for tritium and submitted to an offsite vendor laboratory for analyses of Fe-55, P-32, Sr-89, Sr-90 and gross alpha. The dose contributions and isotope quantities from the releases were added to this Radioactive Effluent Release Report for the applicable reporting periods.

The abnormal releases contributed approximately $2.3E+01\%$ of the calculated total-body dose and approximately $2.4E+01\%$ of the calculated maximum organ dose for the combined total of all normal and abnormal liquid radioactive releases.

Gaseous Releases

Unexpected Ventilation Shift During Refueling Outage

On 28 September 2013 during the refueling outage on Unit 3, a small positive pressure outflow was detected and reported by radiation protection workers. The licensee, using its Corrective Action Program (CAP), documented the circumstances for subsequent review and assessment as a possible "abnormal" release (as opposed to a "normal" release which is defined as a release conducted through a system in the ODCM for processing prior to release to the unrestricted area).

Normally, containment of loose radioactive debris is established by a ventilation system capable of maintaining internal spaces at a negative pressure with respect to the outside. Exhaust fans would take suction on the building interiors to route the air through a filtered treatment system.

The positive outflow of air from the plant was through a temporary opening created to support repairs and upgrades to plant systems. This opening was under the continuous surveillance of particulate gamma emitter (e.g. cobalt-60 (Co-60), cesium-137 (Cs-137), zinc-65 (Zn-65), etc.) debris and iodine-131 (I-131) by Radiation Protection technicians as required by procedures. Positive pressure indications alone do not constitute a release of radioactive materials. The

licensee had taken samples from each separate location (the 3B and 3D Residual Heat Removal Heat Exchanger rooms). Only one sample showed positive activity during the time of positive pressure at a concentration of $7.78\text{E-}12$ $\mu\text{Ci/ cc}$ of Co-60.

The licensee took immediate action to prevent possible radioactive contamination from flowing out by installing covers while negative ventilation cannot be maintained until ventilation system components were restored to normal operation. Direct measurement of the flow rate was not possible because of interference from equipment but the differential pressure between inside and outside of the openings is known from continuous measurement.

This abnormal gaseous release was evaluated and the total activity released was found to be $6.51\text{E-}01$ μCi of Co-60 for the period. The release rate was calculated to be $3.62\text{E-}05$ $\mu\text{Ci/ s}$ of Co-60 and this is a maximum projected dose to the limiting receptor of teenage lung of $1.51\text{E-}04$ mrem/ y or $1.01\text{E-}05\%$ of the instantaneous dose rate limit. This release is far below the limits of the ODCMS.

Changes to the ODCM

There were no changes to the ODCM in 2013.

Minimum Detectable Concentrations

If a radionuclide was not detected, "<LLD" was reported as the activity. Samples were analyzed with techniques that achieved the required Lower Limits of Detection (LLD) as specified in ODCMS Table 4.8.B.1, "Radioactive Liquid Waste Sampling and Analysis" (for liquids) or ODCMS Table 4.8.C.1, "Radioactive Gaseous Waste Sampling and Analysis from Main Stack and Vent Stack" (for gases). In all cases, the LLD requirements were satisfied.

Sampling and Analysis Deviations

On March 18 and 19 of 2013, the flow readings for the Emergency Service Water (ESW) instrument were not recorded, although flow remained in the system. ESW is a system which is used to supply cooling water when the normal cooling water is not available or to supply cooling water to the Emergency Diesel Generators (EDG) when operating. Flow was steady before and after the two days at 4 gpm. Therefore, this was a deviation from the requirements for a technician to record the flow rate reading by Peach Bottom procedures. There was no release of radioactivity via the ESW heat exchangers during 2013.

Violations

There were no effluent release violations for the 2013 reporting period.

However, Peach Bottom did receive a non-cited violation (NCV), NRC finding 2012005-03, for an improper revision to the Licensee's ODCM in 2009 which inadvertently affected the dose calculations for subsequent years. This error was discovered by the Licensee and reported to the NRC. Corrections to the past reports are provided in this report in the Errata Section.

Dose Assessment

Introduction

A dose assessment for PBAPS was conducted from measured radioactive effluent source terms and environmental data to verify that PBAPS continues to demonstrate compliance with the limits as well as the requirement of maintaining the doses "as low as is reasonably achievable" as stated in 10 CFR 50, Appendix I.⁷

This report is similar in construction to facilitate comparison with the original Appendix I submittal data to the NRC, "Radioactive Effluent Dose Assessment", Enclosure A, dated 30 September 1976.

The NRCDOSE computer software to run LADTAP and GASPARG for liquid and gaseous, respectively, radioactive effluent dose assessments was used to calculate a dose for ingestion rates, inhalation rates and other factors that estimate exposure pathways. The assumptions are found in NRC Regulatory Guide 1.109, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10 CFR Part 50, Appendix I".⁸

The radioactive source term used for both liquids and gases are the current radioactive source terms given in this report, Attachment 2, "Effluent Summary".

Liquid Dose Assessment

Hydrologic Conditions and Receptor Locations of Interest

PBAPS is located on the Conowingo Pond formed in the Susquehanna River by the Conowingo Dam. For 2013, the average river flow was measured to be approximately 3.34E+04 ft³/s. The original Appendix I submittal states the average is 3.62E+04 ft³/s, in good agreement with the current figure.

Table 6. Receptor Locations and River Flow Regimes⁹

Location Number	Description	Flow Regime (cfs)					
		<1.50E+04		1.50E+04 to 3.50E+04		>3.50E+04	
		Transit Time (h)	Dilution Factor	Transit Time (h)	Dilution Factor	Transit Time (h)	Dilution Factor
3	1500 ft down flow of Plant Discharge	15	1.4	3	2.2	1.5	1.7
6	Glen Cove	68	1.5	17	3.6	11	12
8	Conowingo Dam	100	2.9	25	7.7	16	14
10	Chester Water intake	70	2.9	11	5.9	4	8.3

⁷ <http://www.nrc.gov/reading-rm/doc-collections/cfr/part050/part050-appi.html>, accessed 9 April 2014.

⁸ <http://pbadupws.nrc.gov/docs/ML0037/ML003740384.pdf>, accessed 9 April 2014.

⁹ Data are from "Radioactive Effluent Dose Assessment", Enclosure A, 30 September 1976, Table III-1.

Based on data provided in the original Dose Assessment, a special location for Sport Fishing was added because members of the public do some fishing at the 1500 ft down from the Discharge Canal location. Therefore, this location was added to the LADTAP model. This location would represent the limiting receptor for this study. No invertebrate intake was examined because invertebrate ingestion pathways are not significant close to PBAPS.

There are three separate flow regimes that were used in the original Appendix I submittal, however, the most-limiting of them ($<1.50E+04 \text{ ft}^3/\text{s}$) was used to calculate a dose assessment for this report because this would provide a bounding extreme for all PBAPS liquid effluents. Therefore, although the actual average stream flow for the year was more than double the limiting case, this report will provide an upper limit for the most-limiting dose.

Liquid Effluent Dose Assessment Conclusion

The limiting dose was $2.01E-06$ mrem with the maximum receptor as the child liver. This is approximately five orders of magnitude less than the original Appendix I submittal for projected doses for the same pathway. The reason for this large reduction in liquid radioactive dose from the 1976 submittal is the source term. That is, PBAPS is releasing much less activity and fewer nuclides than was previously-expected.

Using the methodology in the ODCM, the limiting dose was calculated to be $8.71E-05$ mrem with the maximum receptor as the child liver. This is in agreement with LADTAP output in terms of both rough order of magnitude and limiting receptor. The ODCM is more limiting (i.e. calculates a higher dose) than LADTAP, which is considered conservative.

Therefore, PBAPS liquid radioactive effluent controls continue to demonstrate compliance with 10 CFR 50, Appendix I objectives for the purposes of keeping doses to members of the public "as low as is reasonably achievable". These limiting or maximum calculated doses are a small fraction of the limits in Appendix I.

Gaseous Dose Assessment

Meteorology is an inherently-chaotic system. The dispersion of radioactive materials in the atmosphere is an intense area of study that spans more than 60 years. Nuclear power plants operate meteorological instrumentation on-site to continuously obtain weather conditions such that accurate and precise meteorological conditions can be used in assessing the radiological impact of those releases. The 'effect' of meteorology on the dispersion of radioactive materials is broken down into two major factors: "Dispersion Factor", symbol " (X/Q) " and spoken "chi-over-q", and the "Deposition Factor", symbol " (D/Q) " and spoken "d-over-q". The X/Q is for gases whereas D/Q is for particulates and other non-gases. A complex computer code is used to determine these factors based on data for a time-period of interest. Here, these are considered in three separate runs: Historical/ Official, 1-year (2013) Annual Average and the 10-year (2004-2013) Average.

Limiting receptors for dose also require identification. PBAPS employs a contractor to determine, once per year, the location of real receptors (e.g. dairy operations, residents, gardens and other food-pathways of interest). This determination is the Annual Land-Use Census. When coupled to the meteorology, this provides a powerful method for the regulator and the licensee to evaluate the program for effective sampling and analysis of effluents. The inputs to the dose assessment are given in Table 7 and Table 8.

Table 7. Elevated (Main Offgas Stack) Release Receptors from the 2013 Land-Use Census

Direction	Address/ GASPAR Location Name	Coordinates		Distance (m)	X/Q undepleted undecayed (s/m ³)	D/Q (1/m ²)	GASPAR Location Number	Dose Assessment Receptors Examined (actual use)
N	1837 Susquehannock Dr.	N 39° 48' 12.5"	W 76° 16' 13.6"	4877	4.90E-08	3.56E-10	1	Highest X/Q for NG plume/ immersion dose
SSE	870 Burke Rd.	N 39° 44' 59.6"	W 76° 15' 46.7"	1194	8.99E-09	9.63E-10	2	ground plane + inhalation + vegetation
SSE	758 Orchard Rd.	N 39° 44' 3.7"	W 76° 15' 30.9"	2937	2.47E-08	6.44E-10	3	vegetation
WNW	1725 Paper Mill Rd.	N 39° 45' 49.4"	W 76° 16' 54.8"	1197	9.81E-09	7.89E-10	4	Vegetation, goat meat
W	1321 /1323 Lay Rd.	N 39° 45' 38.4"	W 76° 17' 14.1"	1565	6.70E-09	5.12E-10	5	Milk

Table 8. Ground-Level (Reactor Building Vent) Release Receptors from the 2013 Land-Use Census

Direction	Address/ GASPAR Location Name	Coordinates		Distance (m)	X/Q undepleted undecayed (s/m ³)	D/Q (1/m ²)	GASPAR Location Number	Dose Assessment Receptors Examined (actual use)
SSE	870 Burke Rd.	N 39° 44' 59.6"	W 76° 15' 46.7"	1194	1.14E-06	1.06E-08	1	Vegetation + inhalation + ground plane
NW	1654 Lay Rd.	N 39° 45' 51.37"	W 76° 16' 39.68"	893	1.39E-06	8.38E-09	2	immersion and plume dose (X/Q) + ground plane + inhalation
WNW	1586 /1624 Lay Rd.	N 39° 45' 48.31"	W 76° 16' 41.88"	885	1.31E-06	6.29E-09	3	Ground plane + Inhalation
W	1321 /1323 Lay Rd.	N 39° 45' 38.4"	W 76° 17' 14.1"	1565	5.52E-07	2.33E-09	4	Milk
WNW	1725 Paper Mill Rd.	N 39° 45' 48.2"	W 76° 16' 59.1"	1228	8.85E-07	3.70E-09	5	Vegetation, goat meat

Dose Calculations from 2013 Source Term with the 2013 Meteorology and a 10-Year-Averaged Meteorology

While large changes are not expected over a decade of data, one effect is a 'smoothing' of the data because it is an average effect of the prevailing winds and other weather patterns. Therefore, while some 2013 weather that would likely impact the overall X/Q and D/Q, those periods would be diluted and a more 'substantial' meteorological picture is created. The 2013 meteorology is also provided as a comparison.

Elevated Releases from the Main Offgas Stack

Again, because so much of the noble gas activity is not identified in routine grab samples of noble gases due to concentrations of these gases being below detection limits, it is difficult to attribute dose (Skin or Total Body) to either Kr-87 or Kr-88 as required by the ODCM and

NUREG-0133 (for elevated releases only). Therefore, the doses from both scenarios are used to form a limiting case.

Table 9. Elevated Release Dose from 2013 Source Term and 2013 Meteorology

Location	Plume (mrem)		Beta Air Dose (mrad)		Gamma Air Dose (mrad)		Particulate and Iodines (H-3 and C-14) (mrem)
	Kr-87	Kr-88	Kr-87	Kr-88	Kr-87	Kr-88	
1	6.90E-04	1.66E-03	4.95E-04	3.54E-04	2.92E-04	1.77E-03	2.41E-01
2	3.22E-04	3.22E-04	2.28E-04	6.87E-05	1.38E-04	3.44E-04	4.46E-02
3	9.28E-04	9.06E-04	6.58E-04	1.93E-04	3.97E-04	9.67E-04	1.21E-01
4	3.49E-04	3.49E-04	2.48E-04	7.44E-05	1.49E-04	3.73E-04	4.81E-02
5	2.28E-04	2.38E-04	1.62E-04	5.08E-05	9.76E-05	2.55E-04	3.21E-02

Ground-Level Releases from the Reactor Building Exhaust Vents

All of the unidentified noble gas has been attributed to Kr-88, in accordance with the ODCM and NUREG-0133. Therefore, multiple scenarios are not required.

Table 10. Ground-Level Dose from 2013 Source Term and 2013 Meteorology

Location	Plume Total (mrem)	Particulate and Iodine (H-3 and C-14) (mrem)	Beta Air Dose (mrad)	Gamma Air Dose (mrad)
1	1.85E-01	1.72E-01	3.82E-02	1.98E-01
2	2.64E-01	2.10E-01	5.46E-02	2.83E-01
3	1.97E-01	1.98E-01	4.06E-02	2.11E-01
4	9.37E-02	8.34E-02	1.94E-02	1.00E-01
5	1.37E-01	1.39E-01	2.84E-02	1.47E-01

Gaseous Radioactive Effluent Dose Assessment Review

The maximum doses calculated from each meteorological input were compared. Table 11 shows these data together for direct comparison. The percentages below each release point dose indicate the percent difference in dose from the ODCM (Historical) methodology.

Table 11. Comparison of Maximum Noble Gases Doses Calculated

	ODCM/ Historical				ODCM/ Historical			
	2012 Year	2013 year	10 year		2012 Year	2013 Year	10 year	
Elevated Maximum Dose	Total Body Dose (mrem)	Total Body Dose (mrem)	Total Body Dose (mrem)	Total Body Dose (mrem)	Beta Air Dose (mrad)	Beta Air Dose (mrad)	Beta Air Dose (mrad)	Beta Air Dose (mrad)
	1.21E-03	1.31E-03	1.66E-03	1.32E-03	2.63E-03	8.49E-04	6.58E-04	8.54E-04
	Change from ODCM	8%	37%	9%		-68%	-75%	-68%
Ground Maximum Dose	2.24E-01	2.22E-01	2.36E-01	2.64E-01	1.57E-01	4.59E-02	4.87E-02	5.46E-02
	Change from ODCM	-1%	5%	18%		-71%	-69%	-65%
Elevated Maximum Dose	ODCM/ Historical				ODCM/ Historical			
	2012 Year	2013 Year	10 year		2012 Year	2013 Year	10 year	
	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)	Gamma Air Dose (mrad)
1.25E-03	1.40E-03	1.77E-03	1.41E-03					
Change from ODCM	12%	42%	13%					
Ground Maximum Dose	2.32E-01	2.38E-01	2.52E-01	2.83E-01				
	Change from ODCM	3%	9%	22%				

Table 12. Comparison of Particulate and Iodine (H-3 and C-14) Doses Calculated

	ODCM/ Historical	2012 Year	2013 year	10 year
	Particulate and Iodines (H-3 and C-14) (mrem)	Particulate and Iodine (H-3 and C-14) mrem	Particulate and Iodine (H-3 and C-14) mrem	Particulate and Iodine (H-3 and C-14) mrem
Elevated Maximum Dose	5.20E-01	2.34E-01	1.44E+00	1.13E+00
Change from ODCM		-55%	177%	117%
Ground Maximum Dose	2.90E-02	2.40E-01	1.94E-01	1.72E-01
Change from ODCM		728%	570%	493%

Gaseous Effluent Dose

The limiting dose was 1.44E+00 mrem with the maximum receptor as the child bone because of the large dose impact of carbon-14. The noble gas limiting air doses were 2.83E-01 mrad (gamma) and 5.46E-02 mrad (beta). The maximum total body dose due to noble gas effluents was 2.64E-01 mrem. These are the most limiting doses over all meteorological scenarios. The large and consistent difference in the C-14 doses from 'actual' meteorology (i.e. 2012, 2013 and the 10-year average) is because of the different methodology used to calculate C-14 dose. Exelon Nuclear uses a more-detailed C-14 dose projection from the Electric Power Research Institute, Technical Report 1021106. Details for the assumptions used in this calculation may be found there.¹⁰

These data indicate that the limiting real receptors are still the limiting receptors and are appropriate for continued use in the program. However, because of meteorological changes over the last 10 years, it is appropriate to review the ODCM for revision to the 'historical' value such that new values are used and maintain the ODCM dose calculations as limiting. Overall, the dose values are quite small although the percent changes are large. Any changes made to the ODCM will be included in the 2014 Annual Radioactive Effluent Release Report.

¹⁰ For PBAPS uses specific Boiling Water Reactor assumptions because the fraction of C-14 that is in the CO₂ form will vary based on general plant design. This is important because the major dose pathway is through photosynthesis and, therefore, only the oxide form is relevant.

Peach Bottom Atomic Power Station
Unit 2 and 3

Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC

Attachment 2: Effluent Summary

Gaseous Effluents - Summation of All Releases

Period: January 1, 2013 through December 31, 2013

Unit: Peach Bottom

A. Fission & Activation Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Release	Ci	9.06E+01	1.15E+02	1.28E+02	1.33E+02	3.51E+01
2. Average release For the Period	uCi/ s	1.16E+01	1.47E+01	1.61E+01	1.67E+01	
3. Gamma Air Dose	mrad	3.30E-02	4.72E-02	4.81E-02	5.15E-02	
4. Beta Air Dose	mrad	4.33E-02	6.16E-02	6.29E-02	6.72E-02	
5. Percent of ODCM limit						
Gamma Air Dose	%	3.30E-01	4.72E-01	4.81E-01	5.15E-01	
Beta Air Dose	%	4.33E-01	6.16E-01	6.29E-01	6.72E-01	

B. Iodines

1. Total I-131	Ci	1.32E-04	2.37E-04	3.99E-04	6.25E-05	1.76E+01
2. Average release For the Period	uCi/ s	1.70E-05	3.01E-05	5.02E-05	7.86E-06	
3. Percent of ODCM limit	%	*	*	*	*	

C. Particulate

1. Particulates with T1/2 > 8 days	Ci	4.90E-05	1.18E-04	4.35E-04	1.93E-04	1.94E+01
2. Average release For the Period	uCi/ s	6.30E-06	1.50E-05	5.47E-05	2.42E-05	
3. Percent of ODCM limit	%	*	*	*	*	

D. Tritium

1. Total Release	Ci	1.81E+01	3.17E+01	1.96E+01	1.50E+01	1.11E+01
2. Average release For the Period	uCi/ s	2.33E+00	4.03E+00	2.46E+00	1.89E+00	
3. Percent of ODCM limit	%	*	*	*	*	

E. Gross Alpha

1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	4.00E+02
2. Average release For the Period	uCi/ s	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	*	*	*	*	

F. Carbon-14

1. Total Release	Ci	8.87E+00	8.87E+00	8.87E+00	8.87E+00	
2. Average release For the Period	uCi/ s	1.14E+00	1.13E+00	1.12E+00	1.12E+00	

G. Iodine-131, 133 and 135, Tritium, Carbon-14 & Particulate

1. Organ Dose	mrem	1.37E-01	1.37E-01	1.37E-01	1.37E-01	
2. Percent ODCM limit	%	9.16E-01	9.16E-01	9.16E-01	9.16E-01	

Gaseous Effluents for Elevated Release Point - Main Stack

Period: January 1, 2013 through December 31, 2013

Unit: Peach Bottom

Nuclides Released		Continuous Mode				Batch Mode			
1. Fission Gases	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	5.84E-01	<LLD	2.46E+00	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	1.41E+00	1.01E+00	1.25E+00	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	2.37E+00	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Unidentified	Ci	2.06E+01	1.34E+01	2.25E+01	2.41E+01	<LLD	<LLD	<LLD	<LLD
Total For Period	Ci	2.26E+01	1.67E+01	2.63E+01	2.41E+01	<LLD	<LLD	<LLD	<LLD
2. Iodines									
I-131	Ci	3.19E-05	4.22E-05	1.61E-04	5.51E-05	<LLD	<LLD	<LLD	<LLD
I-133	Ci	4.55E-05	1.03E-04	1.60E-04	1.01E-04	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total For Period	Ci	7.74E-05	1.45E-04	3.20E-04	1.56E-04	<LLD	<LLD	<LLD	<LLD
3. Particulates									
Sr-89	Ci	3.86E-05	3.91E-05	5.69E-05	6.12E-05	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	4.79E-07	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	4.35E-06	2.70E-06	4.60E-06	8.19E-05	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	1.82E-06	2.02E-06	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	6.07E-06	1.55E-05	5.85E-05	3.94E-05	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	5.11E-06	7.55E-06	<LLD	<LLD	<LLD	<LLD
Ru-103	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Au-199	Ci	<LLD	<LLD	<LLD	5.52E-07	<LLD	<LLD	<LLD	<LLD
Total For Period	Ci	4.90E-05	5.78E-05	1.27E-04	1.93E-04	<LLD	<LLD	<LLD	<LLD
4. Tritium									
H-3	Ci	1.75E+00	2.11E+00	8.33E+00	2.03E+00	<LLD	<LLD	<LLD	<LLD
5. Gross Alpha									
Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
6. Carbon-14									
C-14	Ci	8.61E+00	8.61E+00	8.61E+00	8.61E+00	<LLD	<LLD	<LLD	<LLD

Gaseous Effluents for Ground Level Release Points Unit 2 and Unit 3 Roof Vents

Period: January 1, 2013 through December 31, 2013

Unit: Peach Bottom

Nuclides Released		Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
1. Fission Gases	Unit								
Kr-85	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ar-41	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Unidentified	Ci	6.80E+01	9.88E+01	1.01E+02	1.09E+02	<LLD	<LLD	<LLD	<LLD
Total For Period	Ci	6.80E+01	9.88E+01	1.01E+02	1.09E+02	<LLD	<LLD	<LLD	<LLD
2. Iodines									
I-131	Ci	1.00E-04	1.95E-04	2.38E-04	7.36E-06	<LLD	<LLD	<LLD	<LLD
I-133	Ci	2.75E-04	1.16E-03	9.91E-04	3.41E-05	<LLD	<LLD	<LLD	<LLD
I-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total For Period	Ci	3.76E-04	1.35E-03	1.23E-03	4.15E-05	<LLD	<LLD	<LLD	<LLD
3. Particulates									
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	<LLD	7.25E-06	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	6.04E-05	2.66E-04	<LLD	<LLD	<LLD	6.51E-09	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-59	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	<LLD	3.49E-05	<LLD	<LLD	<LLD	<LLD	<LLD
Ru-103	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total For Period	Ci	<LLD	6.04E-05	3.08E-04	<LLD	<LLD	<LLD	6.51E-09	<LLD
4. Tritium									
H-3	Ci	1.63E+01	2.96E+01	1.13E+01	1.30E+01	<LLD	<LLD	<LLD	<LLD
5. Gross Alpha									
Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
6. Carbon-14									
C-14	Ci	2.66E-01	2.66E-01	2.66E-01	2.66E-01	<LLD	<LLD	<LLD	<LLD

Liquid Effluents - Summation of All Releases

Period: January 1, 2013 to December 31, 2013

Unit: Peach Bottom

A. Fission & Activation Gases	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
1. Total Release (not including tritium, gases & alpha)	Ci	<LLD	2.98E-06	4.81E-05	5.03E-05	2.11E+01
2. Average diluted concentration for the Period	µCi/ mL	<LLD	4.42E-15	7.30E-14	8.74E-14	
3. Percent of applicable limit						
Total Body Dose	%	2.33E-04	3.56E-04	2.02E-03	1.54E-04	
Organ Dose	%	7.00E-05	1.30E-04	6.16E-04	5.71E-05	

B. Tritium						Est. Total Error %
1. Total Release	Ci	7.23E-01	1.03E+00	5.50E+00	3.67E-01	6.40E+00
2. Average diluted concentration for the Period	µCi/ mL	1.18E-09	1.52E-09	8.34E-09	6.38E-10	
3. Percent of applicable limit	%	1.18E-05	1.52E-05	8.34E-05	6.38E-06	

(10x 10CFR20 Limit of 1.00E-03 uCi/ mL; ODCMS 3.8.B.1.a)

C. Dissolved & Entrained Gases						Est. Total Error %
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	2.11E+01
2. Average diluted concentration for the Period	µCi/ mL	<LLD	<LLD	<LLD	<LLD	
3. Percent of ODCM limit	%	0.00E+00	0.00E+00	0.00E+00	0.00E+00	

D. Gross Alpha Activity						Est. Total Error %
1. Total Release	Ci	<LLD	<LLD	<LLD	<LLD	2.30E+01

E. Volume of Waste Released (prior to dilution)	Liters	8.58E+07	8.69E+07	8.90E+07	8.78E+07
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F. Volume of Dilution Water Used During Period	Liters	6.16E+11	6.74E+11	6.59E+11	5.76E+11
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Liquid Effluents Release Points – Liquid Radwaste, RHR Leaks and Tritium Leaks

Period: January 1, 2013 through December 13, 2013

Unit: Peach Bottom

Nuclides Released	Unit	Continuous Mode				Batch Mode			
		Quarter 1	Quarter 2	Quarter 3	Quarter 4	Quarter 1	Quarter 2	Quarter 3	Quarter 4
Sr-89	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137	Ci	<LLD	9.53E-08	4.41E-07	4.79E-07	<LLD	1.04E-06	<LLD	<LLD
I-131	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	Ci	<LLD	<LLD	1.65E-07	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	Ci	<LLD	1.30E-06	2.83E-05	3.26E-05	<LLD	1.85E-07	9.05E-06	<LLD
Fe-59	Ci	<LLD	<LLD	7.02E-08	<LLD	<LLD	<LLD	<LLD	<LLD
Zn-65	Ci	<LLD	2.25E-07	1.83E-06	1.39E-06	<LLD	<LLD	<LLD	<LLD
Mn-54	Ci	<LLD	1.28E-07	4.06E-06	4.09E-06	<LLD	<LLD	<LLD	<LLD
Cr-51	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
La-140	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-141	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Fe-55	Ci	<LLD	<LLD	4.17E-06	1.17E-05	<LLD	<LLD	<LLD	<LLD
Sb-124	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
H-3	Ci	7.14E-01	4.01E-01	3.67E-01	3.67E-01	9.63E-03	6.26E-01	5.13E+00	1.55E-04
P-32	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Total for Period	Ci	7.14E-01	4.01E-01	3.67E-01	3.67E-01	9.63E-03	6.26E-01	5.13E+00	1.55E-04
Kr-87	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Gross Alpha	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

Peach Bottom Atomic Power Station
Unit 2 and 3

Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC

Attachment 3: Solid Waste and Irradiated Fuel Shipments

Solid Waste Shipped

1. Type of Waste

	Units	Volume or Activity	Est. error %
a: Spent resin, Filters, Sludges, Evaporator Bottoms, etc.	m ³	6.55E+01	
	Ci	1.26E+02	25
b: Dry compressible waste, Contaminated Equipment, etc.	m ³	1.83E+03	
	Ci	1.01E+01	25
c: Irradiated components, Control rods, etc.	m ³	N/A ¹¹	
	Ci	N/A	N/A
d: Other (describe) Oil	m ³	1.02E+01	
	Ci	2.85E-03	25

¹¹ "Irradiated components" is not applicable because there were no shipments in 2013.

2. Estimate of Major Nuclide Composition (by type of waste)

a. Spent-Resin, Filters, Sludges, Evaporator Bottoms, etc.

Nuclide	Abundance (no cutoff)	Activity (Ci)
H-3	0.016%	2.01E-02
C-14	0.263%	3.30E-01
K-40	0.025%	3.18E-02
Cr-51	0.000%	1.97E-05
Mn-54	2.568%	3.23E+00
Fe-55	11.724%	1.47E+01
Fe-59	0.000%	3.01E-04
Co-57	0.001%	1.88E-03
Co-58	0.029%	3.65E-02
Co-60	64.219%	8.08E+01
Ni-63	2.780%	3.50E+00
Zn-65	8.506%	1.07E+01
Sr-89	0.000%	6.23E-05
Sr-90	0.013%	1.69E-02
Zr-95	0.001%	8.63E-04
Nb-95	0.000%	1.43E-05
Tc-99	0.010%	1.28E-02
Ag-110m	0.295%	3.71E-01

Nuclide	Abundance (no cutoff)	Activity (Ci)
I-129	0.001%	1.37E-03
I-131	0.000%	1.70E-18
I-135	0.000%	3.18E-47
Cs-134	0.091%	1.15E-01
Cs-137	8.997%	1.13E+01
Ba-140	0.000%	1.43E-12
La-140	0.000%	3.37E-46
Ce-141	0.000%	1.17E-06
Ce-144	0.378%	4.75E-01
Hf-181	0.000%	8.28E-07
Pu-238	0.000%	4.25E-04
Pu-239	0.000%	4.20E-05
Pu-241	0.081%	1.02E-01
Am-241	0.000%	4.35E-04
Cm-242	0.000%	1.11E-05
Cm-243	0.001%	8.98E-04
Cm-244	0.000%	4.50E-05

b. Dry, Compressible Waste, Contaminated Equipment, etc.

Nuclide	Abundance (no cutoff)	Activity (Ci)
H-3	0.587%	5.90E-02
C-14	0.317%	3.19E-02
Cr-51	1.373%	1.38E-01
Mn-54	4.013%	4.03E-01
Fe-55	17.002%	1.71E+00
Fe-59	0.096%	9.61E-03
Co-58	0.729%	7.33E-02
Co-60	48.981%	4.92E+00
Ni-63	1.782%	1.79E-01
Zn-65	16.529%	1.66E+00
Sr-89	0.020%	1.98E-03
Tc-99	0.132%	1.33E-02
Sb-124	0.001%	5.13E-05

Nuclide	Abundance (no cutoff)	Activity (Ci)
I-129	0.014%	1.45E-03
Cs-134	0.166%	1.67E-02
Cs-137	7.804%	7.85E-01
Ba-137m	0.090%	9.02E-03
Ce-141	0.015%	1.54E-03
Ce-144	0.159%	1.60E-02
Pr-144	0.017%	1.68E-03
Pu-238	0.000%	2.26E-05
Pu-239	0.000%	3.39E-06
Pu-241	0.012%	1.16E-03
Am-241	0.000%	1.02E-05
Cm-242	0.000%	6.82E-06

c. Irradiated Components, Control Rods, etc.

Nuclide	Abundance (no cutoff)	Activity (Ci)
None for 2013		

d. Other: Oil.

Nuclide	Abundance (no cutoff)	Activity (Ci)
H-3	0.85%	2.42E-05
C-14	1.20%	3.41E-05
Co-60	4.81%	1.37E-04
Ni-63	43.52%	1.24E-03
Tc-99	0.55%	1.58E-05
I-129	0.12%	3.44E-06
Cs-137	4.04%	1.15E-04
Ce-144	44.92%	1.28E-03

3. Solid Waste Disposition

Number of shipments	Mode of Transportation	Destination
16	highway	Energy Solutions CWF (Clive, UT)
4	highway	Energy Solutions BWF (Clive, UT)
55	highway	Energy Solutions (Oak Ridge, TN)
7	highway	Energy Solutions (Kingston, TN)

Irradiated Fuel Shipments

No shipment of irradiated fuel was made during the reporting period of 2013.

Changes to Process Control Program (PCP)

No changes to the Radioactive Waste Process Control Program were made during the reporting period of 2013.

Peach Bottom Atomic Power Station
Unit 2 and 3

Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC

Attachment 4: Radiological Impact on Man

Radiological Impact on Man

Effluent	Applicable Organ	Estimated Dose	Age Group	Location		% of Applicable Limit	Limit	Unit
				Distance (meters)	Direction (toward)			
Noble Gas	Gamma - Air Dose	2.05E-01	All	1.10E+03	SSE	1.02E+00	2.00E+01	mrad
Noble Gas	Beta - Air Dose	1.41E-01	All	1.10E+03	SSE	3.51E-01	4.00E+01	mrad
Noble Gas	Total Body (gamma)	2.25E-01	All	1.10E+03	SSE	2.25E+00	1.00E+01	mrem
Noble Gas	Skin (Beta)	2.93E-01	All	1.10E+03	SSE	9.77E-01	3.00E+01	mrem
Gaseous Iodine, Particulate, Carbon-14 & Tritium	Bone	5.49E-01	Child	1.10E+03	SSE	1.83E+00	3.00E+01	mrem
Gaseous Iodine, Particulate & Tritium	Thyroid	1.25E-02	Infant	1.10E+03	SSE	4.17E-02	3.00E+01	mrem
Liquid	Total Body (gamma)	8.29E-05	Child	Site Boundary		1.38E-03	6.00E+00	mrem
Liquid	Liver	8.71E-05	Child			4.35E-04	2.00E+01	mrem
Direct Radiation	Total Body	0.00E+00	All	1.15E+03	SSE	0.00E+00	2.20E+01	mrem

40 CFR 190 Doses

40 CFR Part 190 Compliance								
Total Dose	Total Body	2.25E-01	All	1.15E+03	SSE	9.00E-01	2.50E+01	mrem
Total Dose	Thyroid	1.25E-02	All	1.15E+03	SSE	1.67E-02	7.50E+01	mrem
Total Dose	Bone	5.50E-01	All	1.15E+03	SSE	2.20E+00	2.50E+01	mrem
Total Dose	Total Body	2.25E-01	All	1.15E+03	SSE	7.50E+00	3.00E+00	mrem
Total Dose	Bone	5.49E-01	All	1.15E+03	SSE	1.83E+01	3.00E+00	mrem
Total Dose	Thyroid	2.17E-01	All	1.15E+03	SSE	3.95E-01	5.50E+01	mrem

Liquid and Gaseous Effluent Radiation Monitors and Instrumentation

Flow readings for the Emergency Service Water Radiation Monitor (ESW RM) were not obtained on 18 March 2013 and 19 March 2013. These readings are required to be obtained daily. The purpose of the ESW RM is to indicate an abnormal leakage of radioactive water from Peach Bottom Atomic Power Station since ESW can potentially become contaminated. There was no detectable activity released from ESW heat exchangers in 2013.

Peach Bottom Atomic Power Station
Unit 2 and 3

Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC

Attachment 5: Meteorological Data

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Extremely Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	3	0	0	0	0	3
NE	3	1	0	0	0	0	4
ENE	3	0	0	0	0	0	3
E	0	3	1	0	0	0	4
ESE	0	4	4	0	0	0	8
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	2	0	0	2
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	3	0	0	3
NNW	0	0	3	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	6	12	9	5	0	0	32

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Moderately Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	0	0	0	0	3
NNE	0	2	0	0	0	0	2
NE	1	0	0	0	0	0	1
ENE	5	0	0	0	0	0	5
E	2	4	1	0	0	0	7
ESE	1	6	0	0	0	0	7
SE	0	4	1	0	0	0	5
SSE	0	0	2	0	0	0	2
S	0	0	1	0	0	0	1
SSW	0	0	1	0	0	0	1
SW	0	0	3	1	0	0	4
WSW	0	0	0	1	0	0	1
W	0	0	0	4	0	0	4
WNW	0	1	4	8	0	0	13
NW	0	0	8	15	0	0	23
NNW	0	3	12	7	2	0	24
Variable	0	0	0	0	0	0	0
Total	9	23	33	36	2	0	103

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Slightly Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	0	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	3	0	0	0	0	0	3
E	5	2	0	0	0	0	7
ESE	1	2	0	0	0	0	3
SE	0	1	0	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	2	0	0	0	2
SSW	0	2	3	0	0	0	5
SW	0	0	1	0	0	0	1
WSW	0	0	3	0	0	0	3
W	0	1	5	4	0	0	10
WNW	0	1	5	10	0	0	16
NW	0	3	18	25	0	0	46
NNW	0	5	26	17	2	0	50
Variable	0	0	0	0	0	0	0
Total	9	20	63	56	2	0	150

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Neutral - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	17	35	12	6	0	0	70
NNE	15	31	0	3	2	0	51
NE	19	11	5	0	0	0	35
ENE	31	17	3	0	0	0	51
E	14	14	0	0	0	0	28
ESE	4	8	0	0	0	0	12
SE	3	39	11	0	0	0	53
SSE	4	21	9	0	0	0	34
S	4	22	14	5	0	0	45
SSW	2	5	3	1	0	0	11
SW	3	6	3	0	0	0	12
WSW	3	11	10	0	0	0	24
W	3	29	53	12	6	0	103
WNW	4	70	110	30	1	0	215
NW	6	60	113	36	5	0	220
NNW	3	55	127	24	2	0	211
Variable	0	0	0	0	0	0	0
Total	135	434	473	117	16	0	1175

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 2
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Slightly Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	1	0	0	0	0	6
NNE	15	0	0	0	0	0	15
NE	7	0	0	0	0	0	7
ENE	6	0	0	0	0	0	6
E	15	5	0	0	0	0	20
ESE	18	11	0	0	0	0	29
SE	14	26	8	0	0	0	48
SSE	5	17	5	0	0	0	27
S	10	20	3	0	0	0	33
SSW	4	15	0	1	0	0	20
SW	10	12	1	0	0	0	23
WSW	9	31	6	1	0	0	47
W	11	71	9	0	0	0	91
WNW	16	53	24	1	1	0	95
NW	8	20	10	0	0	0	38
NNW	8	17	3	0	0	0	28
Variable	0	0	0	0	0	0	0
Total	161	299	69	3	1	0	533

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 3
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Moderately Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	0	0	0	0	0	8
NNE	6	0	0	0	0	0	6
NE	2	0	0	0	0	0	2
ENE	11	0	0	0	0	0	11
E	13	1	0	0	0	0	14
ESE	8	3	0	0	0	0	11
SE	1	1	0	0	0	0	2
SSE	2	0	1	0	0	0	3
S	2	0	0	0	0	0	2
SSW	1	1	0	0	0	0	2
SW	1	2	0	0	0	0	3
WSW	6	8	0	0	0	0	14
W	9	4	1	0	0	0	14
WNW	5	1	0	0	0	0	6
NW	9	1	0	0	0	0	10
NNW	1	1	0	0	0	0	2
Variable	1	0	0	0	0	0	1
Total	86	23	2	0	0	0	111

Hours of calm in this stability class: 6
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Extremely Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	1	0	0	0	0	0	1
ENE	3	0	0	0	0	0	3
E	2	0	0	0	0	0	2
ESE	1	1	0	0	0	0	2
SE	2	1	0	0	0	0	3
SSE	1	0	0	0	0	0	1
S	1	0	0	0	0	0	1
SSW	2	0	0	0	0	0	2
SW	3	0	0	0	0	0	3
WSW	5	0	0	0	0	0	5
W	8	0	0	0	0	0	8
WNW	5	0	0	0	0	0	5
NW	2	0	0	0	0	0	2
NNW	0	0	0	0	0	0	0
Variable	1	0	0	0	0	0	1
Total	38	2	0	0	0	0	40

Hours of calm in this stability class: 4
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
 Stability Class - Extremely Unstable - 316Ft-33Ft Delta-T (F)
 Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	1	0	0	0	1
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	2	0	0	2
SSE	0	0	1	0	0	0	1
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	1	2	2	0	0	5

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Moderately Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	2	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	0	2	0	0	0	2
SE	0	0	1	1	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	3	0	3
WSW	0	0	0	0	0	0	0
W	0	0	0	0	2	0	2
WNW	0	0	0	2	2	3	7
NW	0	0	1	0	1	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	6	3	8	3	20

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Slightly Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	2	0	0	2
ENE	0	3	1	0	0	0	4
E	0	0	0	0	0	0	0
ESE	0	2	2	1	1	0	6
SE	0	0	3	1	0	0	4
SSE	0	0	1	0	0	0	1
S	0	0	0	2	0	0	2
SSW	0	0	0	2	0	0	2
SW	0	0	0	3	0	0	3
WSW	0	0	0	0	2	0	2
W	0	1	2	0	4	1	8
WNW	0	0	2	8	19	2	31
NW	0	0	1	5	6	3	15
NNW	0	1	2	4	3	0	10
Variable	0	0	0	0	0	0	0
Total	0	8	14	28	35	6	91

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Neutral - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	16	44	9	5	9	85
NNE	1	16	20	3	0	2	42
NE	4	12	15	1	0	5	37
ENE	7	19	16	4	1	0	47
E	2	10	11	5	4	4	36
ESE	4	9	10	12	3	0	38
SE	1	9	39	12	0	0	61
SSE	1	9	30	9	2	0	51
S	2	9	17	10	9	1	48
SSW	0	8	12	8	0	1	29
SW	0	8	9	8	0	0	25
WSW	1	7	10	14	3	1	36
W	2	6	27	73	13	17	138
WNW	2	7	37	115	78	22	261
NW	0	12	65	173	61	20	331
NNW	5	16	64	63	36	10	194
Variable	0	0	0	0	0	0	0
Total	34	173	426	519	215	92	1459

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Slightly Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	5	5	0	0	0	10
NNE	1	3	2	0	0	0	6
NE	1	0	3	0	0	0	4
ENE	2	6	0	0	0	0	8
E	1	6	6	0	0	0	13
ESE	0	1	6	0	0	0	7
SE	3	5	14	5	0	0	27
SSE	0	12	15	8	1	0	36
S	0	4	30	13	1	0	48
SSW	0	7	19	11	1	1	39
SW	2	7	8	5	1	0	23
WSW	0	6	9	17	0	0	32
W	2	3	13	27	2	0	47
WNW	0	6	7	39	11	0	63
NW	1	5	33	27	2	0	68
NNW	1	7	13	1	0	0	22
Variable	0	0	0	0	0	0	0
Total	14	83	183	153	19	1	453

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Moderately Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	0	0	0	0	1
NNE	0	3	0	0	0	0	3
NE	1	1	0	0	0	0	2
ENE	0	0	1	0	0	0	1
E	2	2	5	0	0	0	9
ESE	0	3	3	0	0	0	6
SE	0	1	4	1	0	0	6
SSE	0	2	9	0	0	0	11
S	0	3	10	0	1	0	14
SSW	0	0	8	1	0	0	9
SW	0	3	1	0	0	0	4
WSW	0	2	4	1	0	0	7
W	0	0	2	2	1	0	5
WNW	0	2	0	0	0	0	2
NW	0	3	4	1	0	0	8
NNW	0	0	2	1	0	0	3
Variable	0	0	0	0	0	0	0
Total	4	25	53	7	2	0	91

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: January - March 2013
Stability Class - Extremely Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	1	0	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	1	5	0	0	0	6
SE	0	0	2	0	0	0	2
SSE	0	2	1	0	0	0	3
S	1	5	1	2	0	0	9
SSW	0	2	1	0	0	0	3
SW	1	1	0	0	0	0	2
WSW	0	1	1	0	0	0	2
W	0	1	0	0	0	0	1
WNW	0	0	0	0	0	0	0
NW	0	2	5	0	0	0	7
NNW	0	0	5	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	2	16	21	2	0	0	41

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 0

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Extremely Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	5	0	0	0	0	6
NNE	0	9	0	0	0	0	9
NE	4	8	0	0	0	0	12
ENE	11	16	0	0	0	0	27
E	8	12	0	0	0	0	20
ESE	1	17	1	0	0	0	19
SE	0	16	5	0	0	0	21
SSE	0	9	4	0	0	0	13
S	0	0	1	3	0	0	4
SSW	0	0	0	0	0	0	0
SW	0	0	1	0	0	0	1
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	2	1	0	0	3
NW	0	0	0	0	0	0	0
NNW	0	3	3	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	25	95	17	4	0	0	141

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Moderately Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	7	2	0	0	0	9
NNE	1	3	1	0	0	0	5
NE	4	0	0	0	0	0	4
ENE	7	6	0	0	0	0	13
E	4	6	0	0	0	0	10
ESE	5	8	0	0	0	0	13
SE	1	6	1	0	0	0	8
SSE	0	6	5	2	0	0	13
S	0	8	9	3	0	0	20
SSW	0	2	3	0	0	0	5
SW	0	4	3	0	0	0	7
WSW	0	3	2	1	0	0	6
W	0	6	3	0	0	0	9
WNW	0	3	3	11	0	0	17
NW	0	4	11	7	0	0	22
NNW	0	6	9	4	0	0	19
Variable	0	0	0	0	0	0	0
Total	22	78	52	28	0	0	180

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Slightly Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	10	1	0	0	0	11
NNE	0	4	1	0	0	0	5
NE	1	1	0	0	0	0	2
ENE	4	4	0	0	0	0	8
E	4	3	0	0	0	0	7
ESE	0	1	0	0	0	0	1
SE	1	7	3	0	0	0	11
SSE	0	4	3	0	0	0	7
S	0	7	7	2	0	0	16
SSW	0	1	1	0	0	0	2
SW	0	0	3	0	0	0	3
WSW	0	1	4	0	0	0	5
W	0	3	3	1	0	0	7
WNW	0	1	9	5	0	0	15
NW	0	4	5	3	0	0	12
NNW	0	5	5	1	0	0	11
Variable	0	0	0	0	0	0	0
Total	10	56	45	12	0	0	123

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Neutral - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	7	10	13	0	0	0	30
NNE	6	8	3	0	0	0	17
NE	15	6	0	0	0	0	21
ENE	35	3	0	0	0	0	38
E	16	26	1	0	0	0	43
ESE	15	29	1	0	0	0	45
SE	6	43	7	0	0	0	56
SSE	8	34	24	3	0	0	69
S	7	34	35	11	0	0	87
SSW	2	21	11	0	0	0	34
SW	1	15	11	0	0	0	27
WSW	2	18	9	2	0	0	31
W	5	11	19	3	0	0	38
WNW	0	18	21	5	0	0	44
NW	4	8	34	11	0	0	57
NNW	4	16	43	17	0	0	80
Variable	0	0	0	0	0	0	0
Total	133	300	232	52	0	0	717

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Slightly Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	7	1	1	0	0	13
NNE	20	1	1	0	0	0	22
NE	15	4	0	0	0	0	19
ENE	24	7	0	0	0	0	31
E	30	9	0	0	0	0	39
ESE	24	23	0	0	0	0	47
SE	27	20	3	0	0	0	50
SSE	26	39	8	0	0	0	73
S	33	41	13	2	0	0	89
SSW	27	20	3	0	0	0	50
SW	12	19	0	0	0	0	31
WSW	21	25	3	0	0	0	49
W	25	35	8	0	0	0	68
WNW	11	34	5	0	0	0	50
NW	8	22	6	0	0	0	36
NNW	8	16	5	0	0	0	29
Variable	0	0	0	0	0	0	0
Total	315	322	56	3	0	0	696

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Moderately Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	0	0	0	0	0	2
NNE	3	0	0	0	0	0	3
NE	1	0	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	6	0	0	0	0	0	6
ESE	9	0	0	0	0	0	9
SE	6	0	0	0	0	0	6
SSE	3	1	0	0	0	0	4
S	5	2	0	0	0	0	7
SSW	4	1	0	0	0	0	5
SW	7	2	0	0	0	0	9
WSW	15	15	5	0	0	0	35
W	16	15	0	0	0	0	31
WNW	8	5	0	0	0	0	13
NW	3	5	0	0	0	0	8
NNW	5	1	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	94	47	5	0	0	0	146

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Extremely Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	0	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	1	0	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	2	0	0	0	0	0	2
ESE	6	0	0	0	0	0	6
SE	2	0	0	0	0	0	2
SSE	1	0	0	0	0	0	1
S	0	0	0	0	0	0	0
SSW	1	0	0	0	0	0	1
SW	1	0	0	0	0	0	1
WSW	12	12	0	0	0	0	24
W	7	9	0	0	0	0	16
WNW	5	2	0	0	0	0	7
NW	3	1	0	0	0	0	4
NNW	3	1	0	0	0	0	4
Variable	4	0	0	0	0	0	4
Total	49	25	0	0	0	0	74

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 104

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Extremely Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	1	0	0	0	1
NE	0	4	5	0	0	0	9
ENE	0	2	2	0	0	0	4
E	0	9	10	6	0	0	25
ESE	0	5	17	1	0	0	23
SE	0	0	7	5	0	0	12
SSE	0	0	2	0	0	0	2
S	0	0	2	0	2	0	4
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	1	1	0	0	2
W	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
NW	0	0	1	0	0	0	1
NNW	0	0	7	1	0	0	8
Variable	0	0	0	0	0	0	0
Total	0	20	55	15	2	0	92

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Moderately Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	4	0	0	0	5
NNE	0	2	1	0	0	0	3
NE	0	3	1	0	0	0	4
ENE	0	6	1	0	0	0	7
E	0	2	2	0	0	0	4
ESE	0	2	9	2	0	0	13
SE	0	0	8	4	0	0	12
SSE	0	0	3	2	1	0	6
S	0	0	6	6	4	0	16
SSW	0	0	1	1	0	0	2
SW	0	0	1	2	0	0	3
WSW	0	0	0	3	1	0	4
W	0	0	0	2	2	0	4
WNW	0	0	0	1	12	2	15
NW	1	0	1	1	0	0	3
NNW	0	2	6	1	0	0	9
Variable	0	0	0	0	0	0	0
Total	1	18	44	25	20	2	110

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Slightly Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	5	0	0	0	7
NNE	0	1	1	0	0	0	2
NE	1	2	1	1	0	0	5
ENE	0	2	2	0	0	0	4
E	1	3	2	1	0	0	7
ESE	1	4	7	1	0	0	13
SE	0	1	7	10	0	0	18
SSE	0	0	4	0	1	0	5
S	0	4	3	15	4	1	27
SSW	0	2	4	3	0	0	9
SW	0	0	2	4	0	0	6
WSW	0	0	1	3	0	0	4
W	0	0	3	6	2	1	12
WNW	0	1	4	11	9	1	26
NW	0	3	6	1	2	0	12
NNW	0	4	10	6	0	0	20
Variable	0	0	0	0	0	0	0
Total	3	29	62	62	18	3	177

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Neutral - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	4	10	9	1	0	24
NNE	2	4	8	3	0	0	17
NE	1	7	7	3	0	0	18
ENE	2	6	10	0	0	0	18
E	5	15	20	15	13	0	68
ESE	2	16	35	38	1	2	94
SE	6	18	56	29	1	0	110
SSE	3	6	33	18	0	0	60
S	1	14	50	43	12	1	121
SSW	4	11	29	13	0	0	57
SW	1	8	21	9	2	0	41
WSW	0	9	13	12	1	0	35
W	1	6	17	19	1	0	44
WNW	0	6	12	13	18	3	52
NW	1	3	10	17	10	5	46
NNW	0	9	14	34	5	1	63
Variable	0	0	0	0	0	0	0
Total	29	142	345	275	65	12	868

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 15
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Slightly Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	2	1	0	0	5
NNE	2	1	0	0	0	0	3
NE	0	3	1	0	0	0	4
ENE	0	10	7	1	0	0	18
E	2	9	5	0	0	0	16
ESE	1	8	3	2	0	0	14
SE	1	8	10	3	0	0	22
SSE	3	13	17	9	0	0	42
S	1	14	38	27	4	0	84
SSW	2	6	25	10	0	0	43
SW	4	9	14	8	0	0	35
WSW	1	10	11	14	3	0	39
W	2	9	13	17	3	0	44
WNW	2	4	10	17	7	0	40
NW	1	3	11	12	1	0	28
NNW	0	5	13	8	0	0	26
Variable	0	0	0	0	0	0	0
Total	22	114	180	129	18	0	463

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 22
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Moderately Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18.	19-24	> 24	
N	0	0	1	0	0	0	1
NNE	1	1	0	0	0	0	2
NE	0	1	1	0	0	0	2
ENE	0	1	0	0	0	0	1
E	0	1	0	0	0	0	1
ESE	0	1	0	0	0	0	1
SE	1	1	1	0	0	0	3
SSE	0	0	1	0	0	0	1
S	1	1	1	0	0	0	3
SSW	1	2	4	0	0	0	7
SW	0	5	9	2	0	0	16
WSW	0	1	9	8	0	0	18
W	0	2	7	6	0	0	15
WNW	0	3	4	1	0	0	8
NW	1	0	8	2	0	0	11
NNW	0	1	5	3	0	0	9
Variable	0	0	0	0	0	0	0
Total	5	21	51	22	0	0	99

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 7
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: April - June 2013
Stability Class - Extremely Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	1	0	0	0	0	0	1
NE	0	0	1	0	0	0	1
ENE	0	1	0	0	0	0	1
E	0	1	0	0	0	0	1
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	1	0	0	0	0	1
WSW	1	2	1	3	0	0	7
W	0	1	0	2	0	0	3
WNW	0	6	0	0	0	0	6
NW	0	2	1	0	0	0	3
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	3	14	3	5	0	0	25

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 2
Hours of missing stability measurements in all stability classes: 303

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Extremely Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	17	0	0	0	0	20
NNE	10	14	0	0	0	0	24
NE	10	0	0	0	0	0	10
ENE	12	1	0	0	0	0	13
E	9	6	0	0	0	0	15
ESE	3	2	0	0	0	0	5
SE	1	14	3	0	0	0	18
SSE	0	16	6	0	0	0	22
S	0	4	11	1	0	0	16
SSW	0	3	5	0	0	0	8
SW	0	1	0	0	0	0	1
WSW	0	2	0	0	0	0	2
W	0	0	0	0	0	0	0
WNW	0	5	0	0	0	0	5
NW	0	1	0	0	0	0	1
NNW	1	9	2	1	0	0	13
Variable	0	0	0	0	0	0	0
Total	49	95	27	2	0	0	173

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Moderately Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	21	0	0	0	0	23
NNE	7	5	0	0	0	0	12
NE	1	0	0	0	0	0	1
ENE	2	0	0	0	0	0	2
E	4	0	0	0	0	0	4
ESE	3	0	0	0	0	0	3
SE	2	4	1	0	0	0	7
SSE	0	6	5	0	0	0	11
S	0	17	10	1	0	0	28
SSW	0	3	4	0	0	0	7
SW	0	4	5	0	0	0	9
WSW	0	8	2	0	0	0	10
W	0	5	1	0	0	0	6
WNW	0	7	0	0	0	0	7
NW	0	9	4	0	0	0	13
NNW	2	29	33	3	0	0	67
Variable	0	0	0	0	0	0	0
Total	23	118	65	4	0	0	210

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Slightly Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	9	0	0	0	0	14
NNE	2	2	0	0	0	0	4
NE	3	0	0	0	0	0	3
ENE	1	0	0	0	0	0	1
E	0	1	0	0	0	0	1
ESE	3	1	0	0	0	0	4
SE	0	1	1	0	0	0	2
SSE	0	5	4	0	0	0	9
S	0	11	5	0	0	0	16
SSW	1	5	1	0	0	0	7
SW	1	7	4	0	0	0	12
WSW	0	5	1	0	0	0	6
W	0	7	0	0	0	0	7
WNW	2	4	0	0	0	0	6
NW	0	3	4	0	0	0	7
NNW	1	19	9	0	0	0	29
Variable	0	0	0	0	0	0	0
Total	19	80	29	0	0	0	128

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Neutral - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	9	35	8	0	0	0	52
NNE	11	5	0	0	0	0	16
NE	4	0	0	0	0	0	4
ENE	11	0	0	0	0	0	11
E	7	0	0	0	0	0	7
ESE	9	1	0	0	0	0	10
SE	6	14	1	0	0	0	21
SSE	12	76	22	0	0	0	110
S	18	45	13	0	0	0	76
SSW	7	18	2	0	0	0	27
SW	8	14	7	0	0	0	29
WSW	12	30	8	0	0	0	50
W	8	8	2	0	0	0	18
WNW	10	12	4	0	0	0	26
NW	5	27	8	0	0	0	40
NNW	11	60	19	0	0	0	90
Variable	1	0	0	0	0	0	1
Total	149	345	94	0	0	0	588

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Slightly Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	27	24	3	0	0	0	54
NNE	10	11	3	0	0	0	24
NE	6	0	0	0	0	0	6
ENE	9	0	0	0	0	0	9
E	9	0	0	0	0	0	9
ESE	15	1	0	0	0	0	16
SE	19	6	0	0	0	0	25
SSE	37	40	0	0	0	0	77
S	49	45	3	0	0	0	97
SSW	42	16	0	0	0	0	58
SW	33	20	0	0	0	0	53
WSW	30	25	0	0	0	0	55
W	35	25	1	0	0	0	61
WNW	21	46	2	0	0	0	69
NW	27	47	3	0	0	0	77
NNW	18	35	0	0	0	0	53
Variable	1	0	0	0	0	0	1
Total	388	341	15	0	0	0	744

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Moderately Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	0	0	0	0	2
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	0	0	0	0	0	1
ESE	3	0	0	0	0	0	3
SE	1	0	0	0	0	0	1
SSE	3	0	0	0	0	0	3
S	11	1	0	0	0	0	12
SSW	10	2	0	0	0	0	12
SW	19	5	0	0	0	0	24
WSW	28	18	0	0	0	0	46
W	42	28	0	0	0	0	70
WNW	20	15	0	0	0	0	35
NW	4	6	0	0	0	0	10
NNW	2	2	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	145	78	0	0	0	0	223

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Extremely Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	1	0	0	0	0	1
SW	10	16	0	0	0	0	26
WSW	28	45	0	0	0	0	73
W	12	14	0	0	0	0	26
WNW	2	5	0	0	0	0	7
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	52	81	0	0	0	0	133

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 4

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Extremely Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	1	0	0	0	1
NE	0	3	0	0	0	0	3
ENE	0	0	2	0	0	0	2
E	0	7	3	0	0	0	10
ESE	0	0	5	0	0	0	5
SE	0	0	2	0	0	0	2
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	10	13	0	0	0	23

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 3
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Moderately Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	0	2	0	0	0	2
NE	0	2	0	0	0	0	2
ENE	0	3	0	0	0	0	3
E	0	2	0	0	0	0	2
ESE	0	0	0	0	0	0	0
SE	0	1	2	0	0	0	3
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	1	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	9	4	1	0	0	14

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 5
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Slightly Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	2	0	0	0	4
NNE	0	3	1	0	0	0	4
NE	0	0	1	0	0	0	1
ENE	1	2	0	0	0	0	3
E	0	2	0	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	0	4	6	0	0	0	10
SSE	0	0	4	1	0	0	5
S	0	0	5	2	1	0	8
SSW	0	4	2	2	0	0	8
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	2	0	0	0	0	2
NW	0	1	1	0	2	0	4
NNW	0	4	1	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	1	25	23	5	3	0	57

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 4
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Neutral - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	20	34	17	1	0	72
NNE	3	4	11	4	1	0	23
NE	2	11	4	0	0	0	17
ENE	2	5	2	0	0	0	9
E	2	4	4	0	0	0	10
ESE	2	7	5	5	0	0	19
SE	3	12	27	8	0	0	50
SSE	0	6	44	16	0	0	66
S	0	24	73	40	3	0	140
SSW	3	17	28	2	0	0	50
SW	3	31	23	7	0	0	64
WSW	2	15	25	8	1	0	51
W	4	16	12	3	0	0	35
WNW	2	12	12	4	0	0	30
NW	2	18	27	24	5	0	76
NNW	2	38	49	27	2	0	118
Variable	0	0	0	0	0	0	0
Total	32	240	380	165	13	0	830

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 78
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Slightly Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	7	20	8	0	0	36
NNE	1	6	17	10	5	0	39
NE	1	8	7	2	0	0	18
ENE	1	8	4	0	0	0	13
E	2	5	0	0	0	0	7
ESE	4	13	0	0	0	0	17
SE	1	15	10	4	0	0	30
SSE	6	11	32	6	0	0	55
S	3	8	68	35	0	0	114
SSW	2	13	42	14	1	0	72
SW	1	29	34	11	0	0	75
WSW	3	16	19	5	0	0	43
W	2	13	17	7	0	0	39
WNW	1	3	8	4	0	0	16
NW	3	8	19	30	5	0	65
NNW	2	7	19	10	0	0	38
Variable	1	0	0	0	0	0	1
Total	35	170	316	146	11	0	678

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 66
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Moderately Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	1	8	0	0	0	10
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	1	1	0	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	1	5	0	0	0	0	6
SSE	0	5	0	0	0	0	5
S	3	11	3	1	0	0	18
SSW	2	5	1	0	0	0	8
SW	2	5	6	2	0	0	15
WSW	2	2	6	7	0	0	17
W	1	5	14	14	0	0	34
WNW	2	2	10	9	0	0	23
NW	0	1	14	12	0	0	27
NNW	1	2	6	1	0	0	10
Variable	2	0	0	0	0	0	2
Total	18	46	68	46	0	0	178

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 63
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: July - September 2013
Stability Class - Extremely Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	1	0	0	0	1
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	1	0	0	0	0	0	1
SW	0	0	0	0	0	0	0
WSW	0	0	4	1	0	0	5
W	0	0	1	2	0	0	3
WNW	0	0	0	1	0	0	1
NW	0	0	1	0	0	0	1
NNW	0	0	6	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	1	0	13	4	0	0	18

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 30
Hours of missing stability measurements in all stability classes: 161

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Extremely Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	0	0	0	0	0	3
NNE	1	5	0	0	0	0	6
NE	5	2	0	0	0	0	7
ENE	10	1	0	0	0	0	11
E	10	2	0	0	0	0	12
ESE	3	5	0	0	0	0	8
SE	0	2	0	0	0	0	2
SSE	0	1	4	0	0	0	5
S	0	0	5	0	0	0	5
SSW	0	0	0	5	0	0	5
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	1	0	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	32	20	9	5	0	0	66

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Moderately Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	3	0	0	0	5
NNE	4	4	0	0	0	0	8
NE	9	0	0	0	0	0	9
ENE	9	0	0	0	0	0	9
E	5	0	0	0	0	0	5
ESE	3	2	0	0	0	0	5
SE	1	3	0	0	0	0	4
SSE	0	0	2	0	0	0	2
S	0	1	3	0	0	0	4
SSW	0	0	1	1	0	0	2
SW	0	2	5	0	0	0	7
WSW	0	0	5	0	0	0	5
W	0	0	1	3	0	0	4
WNW	0	3	10	1	0	0	14
NW	0	2	10	4	0	0	16
NNW	1	5	4	3	0	0	13
Variable	0	0	0	0	0	0	0
Total	32	24	44	12	0	0	112

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Slightly Unstable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	1	1	0	0	0	4
NNE	1	3	0	0	0	0	4
NE	5	0	0	0	0	0	5
ENE	5	0	0	0	0	0	5
E	3	1	0	0	0	0	4
ESE	0	1	0	0	0	0	1
SE	1	2	0	0	0	0	3
SSE	0	2	0	0	0	0	2
S	0	1	4	0	0	0	5
SSW	0	1	1	0	0	0	2
SW	0	1	4	0	0	0	5
WSW	0	3	0	0	0	0	3
W	0	1	2	3	0	0	6
WNW	0	1	8	0	0	0	9
NW	0	0	10	5	1	0	16
NNW	0	3	4	7	0	0	14
Variable	0	0	0	0	0	0	0
Total	17	21	34	15	1	0	88

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Neutral - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	25	48	11	0	0	0	84
NNE	26	25	1	0	0	0	52
NE	21	1	0	0	0	0	22
ENE	20	5	0	0	0	0	25
E	28	6	0	0	0	0	34
ESE	14	7	0	0	0	0	21
SE	7	25	3	0	0	0	35
SSE	13	40	25	2	0	0	80
S	7	33	24	9	0	0	73
SSW	1	7	3	0	0	0	11
SW	4	9	6	0	0	0	19
WSW	7	14	9	2	0	0	32
W	3	14	41	5	0	0	63
WNW	4	28	56	11	0	0	99
NW	6	29	72	30	0	0	137
NNW	1	38	51	11	0	0	101
Variable	0	0	0	0	0	0	0
Total	187	329	302	70	0	0	888

Hours of calm in this stability class: 3
Hours of missing wind measurements in this stability class: 19
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Slightly Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	23	7	0	0	0	0	30
NNE	22	32	0	0	0	0	54
NE	15	2	0	0	0	0	17
ENE	22	2	0	0	0	0	24
E	18	4	0	0	0	0	22
ESE	28	4	0	0	0	0	32
SE	31	22	0	0	0	0	53
SSE	22	30	4	0	0	0	56
S	19	19	5	0	0	0	43
SSW	10	5	1	0	0	0	16
SW	11	18	1	0	0	0	30
WSW	7	74	7	0	0	0	88
W	9	63	11	0	0	0	83
WNW	13	30	8	0	0	0	51
NW	17	16	2	0	0	0	35
NNW	17	10	0	0	0	0	27
Variable	0	0	0	0	0	0	0
Total	284	338	39	0	0	0	661

Hours of calm in this stability class: 4
Hours of missing wind measurements in this stability class: 12
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Moderately Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	0	0	0	0	0	4
NNE	5	0	0	0	0	0	5
NE	6	0	0	0	0	0	6
ENE	7	0	0	0	0	0	7
E	12	0	0	0	0	0	12
ESE	16	1	0	0	0	0	17
SE	10	2	0	0	0	0	12
SSE	4	1	0	0	0	0	5
S	6	0	0	0	0	0	6
SSW	9	1	0	0	0	0	10
SW	16	7	0	0	0	0	23
WSW	30	31	5	0	0	0	66
W	27	9	0	0	0	0	36
WNW	11	4	0	0	0	0	15
NW	8	2	0	0	0	0	10
NNW	9	0	0	0	0	0	9
Variable	1	0	0	0	0	0	1
Total	181	58	5	0	0	0	244

Hours of calm in this stability class: 3
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Extremely Stable - 150Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	0	0	0	0	0	3
NNE	1	0	0	0	0	0	1
NE	3	0	0	0	0	0	3
ENE	8	0	0	0	0	0	8
E	13	0	0	0	0	0	13
ESE	13	2	0	0	0	0	15
SE	2	0	0	0	0	0	2
SSE	2	0	0	0	0	0	2
S	3	0	0	0	0	0	3
SSW	4	0	0	0	0	0	4
SW	6	2	0	0	0	0	8
WSW	23	2	0	0	0	0	25
W	7	0	0	0	0	0	7
WNW	5	0	0	0	0	0	5
NW	0	0	0	0	0	0	0
NNW	4	0	0	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	97	6	0	0	0	0	103

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
 Stability Class - Extremely Unstable - 316Ft-33Ft Delta-T (F)
 Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	1	0	0	0	1
ENE	0	1	1	0	0	0	2
E	0	0	0	0	0	0	0
ESE	0	1	1	0	0	0	2
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	0	0	0	0	0
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	2	4	0	0	0	6

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
 Stability Class - Moderately Unstable - 316Ft-33Ft Delta-T (F)
 Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	1	0	0	0	0	1
NE	0	1	1	0	0	0	2
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	1	0	0	0	1
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	0	1	0	0	0	1
SSW	0	0	0	0	0	0	0
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	3	4	0	0	0	7

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Slightly Unstable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	0	0	0	0
NNE	0	0	2	0	0	0	2
NE	0	0	0	2	0	0	2
ENE	0	2	1	0	0	0	3
E	0	2	0	1	0	0	3
ESE	0	4	0	0	0	0	4
SE	0	0	1	0	0	0	1
SSE	0	0	0	1	0	0	1
S	0	0	0	2	0	0	2
SSW	0	0	0	1	3	0	4
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	0	0	1	0	1
WNW	0	0	0	1	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	8	4	8	4	0	24

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Neutral - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	12	18	32	2	0	69
NNE	5	17	17	24	0	0	63
NE	10	17	13	7	0	0	47
ENE	11	20	16	1	0	0	48
E	7	14	4	5	0	0	30
ESE	2	22	19	1	0	0	44
SE	3	32	22	2	0	0	59
SSE	1	12	24	19	3	0	59
S	0	11	19	21	20	3	74
SSW	0	5	13	10	3	0	31
SW	1	5	16	11	2	0	35
WSW	1	7	12	15	5	2	42
W	1	5	13	38	23	3	83
WNW	0	6	22	67	47	8	150
NW	1	4	13	69	44	11	142
NNW	1	15	22	47	9	1	95
Variable	1	0	0	0	0	0	1
Total	50	204	263	369	158	28	1072

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Slightly Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	6	8	2	0	0	19
NNE	3	7	7	4	1	0	22
NE	3	10	7	22	2	0	44
ENE	9	12	7	2	0	0	30
E	2	21	12	4	0	0	39
ESE	0	17	6	0	2	0	25
SE	8	36	24	1	0	0	69
SSE	3	15	15	16	0	0	49
S	2	25	45	23	11	0	106
SSW	2	9	14	10	1	0	36
SW	6	14	14	20	2	0	56
WSW	4	9	17	38	5	0	73
W	2	6	16	71	10	0	105
WNW	1	2	14	25	8	0	50
NW	1	6	14	24	4	0	49
NNW	0	4	12	6	0	0	22
Variable	0	0	0	0	0	0	0
Total	49	199	232	268	46	0	794

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 2
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Moderately Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	0	0	1	0	0	1
NNE	4	2	0	0	0	0	6
NE	3	2	3	0	0	0	8
ENE	2	4	0	0	0	0	6
E	0	3	0	0	0	0	3
ESE	1	4	2	0	0	0	7
SE	1	4	4	0	0	0	9
SSE	2	1	3	0	0	0	6
S	2	13	10	0	0	0	25
SSW	2	10	10	3	0	0	25
SW	4	21	11	1	2	0	39
WSW	3	7	11	7	2	0	30
W	1	2	8	9	0	0	20
WNW	0	4	6	1	1	0	12
NW	1	3	5	0	0	0	9
NNW	2	0	1	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	28	80	74	22	5	0	209

Hours of calm in this stability class: 0
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Nuclear Station

Period of Record: October - December 2013
Stability Class - Extremely Stable - 316Ft-33Ft Delta-T (F)
Winds Measured at 320 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	0	0	0	1
NNE	0	2	0	0	0	0	2
NE	2	1	0	0	0	0	3
ENE	0	0	0	0	0	0	0
E	4	0	1	0	0	0	5
ESE	0	1	0	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	1	0	0	0	0	1
S	2	4	3	0	0	0	9
SSW	0	5	18	1	0	0	24
SW	2	5	13	1	0	0	21
WSW	1	1	0	0	0	0	2
W	2	3	1	9	0	0	15
WNW	0	0	2	0	0	0	2
NW	0	0	1	0	0	0	1
NNW	0	1	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	13	25	40	11	0	0	89

Hours of calm in this stability class: 1
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 3

Peach Bottom Atomic Power Station
Unit 2 and 3

Licensee: Exelon Generation Company, LLC
PSEG Nuclear, LLC

Appendix A: ERRATA Data Section

Correction to Previously-Reported Ground-Level Noble Gas Doses

In 2009, a revision to the PBAPS ODCM was approved and implemented which included a technical change to the ground-level historical maximum Dispersion Factor (X/Q, or "chi-over-Q") which, when factored with the noble gas release rate, calculates the maximum dose rate at or beyond the site boundary. Because of the chaotic nature of meteorological conditions such as wind direction, speed and turbulence, the X/Q becomes a useful measurement of the radiological impact of radioactive materials when dispersed in the atmosphere when averaged over a long-time period (which at Peach Bottom is defined as a 10-year period). Thus, the X/Q becomes a parameter to describe the location of prevailing winds, the speed of those winds that carry radioactive materials and the rate of divergence at locations of interest. This value is not corrected for radioactive decay (that is, there is no credit taken for natural radioactive decay by the noble gases and is, therefore, a conservative projection of dose) at each location, by Peach Bottom convention. The Elevated Release X/Q was not changed.

The ODCM was revised with a number that could not be independently verified. Therefore, in 2012, the latest 10-year average data were used to develop a new historical X/Q rather than return to the previous value. These data for comparison are provided in Table 13.

Table 13. Ground-Level Dispersion Factor Change

	Previous Historical Average X/Q (s/ m ³)	New Historical Average X/Q (s/ m ³)	Approximate Change
X/Q (ground-level, noble gas)	9.19E-07	1.12E-06	+21.87%

Using the updated value, PBAPS then recalculated all doses that were affected by this change. Since all projected doses are a direct, linear relationship to the X/Q, this 21.87% increase was observed with each value recalculated using the new historical X/Q value.

Although the dose for each category was revised upward, it remains well-below the limits in the ODCM. Limits can be found on Table 1, on page 8.

2008	Total Body (mrem)	Skin Dose (mrem)	Gamma Air Dose (mrad)	Beta Air Dose (mrad)
Elevated Release (Meteorology Not Changed)	1.45E-03	3.52E-03	1.51E-03	2.74E-03
Ground-Level Release, Previous Meteorology	7.28E-02	9.46E-02	7.53E-02	5.10E-02
Ground-Level Release, Updated Meteorology	8.88E-02	1.15E-01	9.17E-02	6.22E-02
Total, Previous Meteorology	7.43E-02	9.81E-02	7.68E-02	5.37E-02
Total, Updated Meteorology	9.03E-02	1.19E-01	9.32E-02	6.49E-02

2009	Total Body (mrem)	Skin Dose (mrem)	Gamma Air Dose (mrad)	Beta Air Dose (mrad)
Elevated Release (Meteorology Not Changed)	1.40E-03	3.14E-03	1.46E-03	2.37E-03
Ground-Level Release, Previous Meteorology	2.66E-01	3.45E-01	2.75E-01	1.86E-01
Ground-Level Release, Updated Meteorology	3.24E-01	4.21E-01	3.35E-01	2.27E-01
Total, Previous Meteorology	2.67E-01	3.48E-01	2.76E-01	1.88E-01
Total, Updated Meteorology	3.25E-01	4.24E-01	3.36E-01	2.29E-01

2010	Total Body (mrem)	Skin Dose (mrem)	Gamma Air Dose (mrad)	Beta Air Dose (mrad)
Elevated Release (Meteorology Not Changed)	7.81E-04	2.23E-03	8.14E-04	1.97E-03
Ground-Level Release, Previous Meteorology	2.75E-01	3.57E-01	2.84E-01	1.93E-01
Ground-Level Release, Updated Meteorology	3.35E-01	4.35E-01	3.46E-01	2.35E-01
Total, Previous Meteorology	2.76E-01	3.59E-01	2.85E-01	1.95E-01
Total, Updated Meteorology	3.36E-01	4.37E-01	3.47E-01	2.37E-01

2011	Total Body (mrem)	Skin Dose (mrem)	Gamma Air Dose (mrad)	Beta Air Dose (mrad)
Elevated Release (Meteorology Not Changed)	1.04E-03	2.58E-03	1.08E-03	2.27E-03
Ground-Level Release, Previous Meteorology	2.10E-01	2.74E-01	2.17E-01	1.47E-01
Ground-Level Release, Updated Meteorology	2.56E-01	3.33E-01	2.65E-01	1.79E-01
Total, Previous Meteorology	2.11E-01	2.77E-01	2.18E-01	1.49E-01
Total, Updated Meteorology	2.57E-01	3.36E-01	2.66E-01	1.81E-01

Correction to Previously-Reported Gaseous Particulate and Iodine Activity Released in Reporting Periods 2007 and 2008

The following are the corrected sections of the 2007 and 2008 Annual Radioactive Effluent Release Report Sections for the "Gaseous Effluents – Summation of All Releases" which is the algebraic sum of the Elevated Releases and the Ground-Level Releases reported for each quarter. These errors were discovered and submitted to the licensee's Corrective Action Program (CAP) for disposition.

Previously, the reports for 2007 and 2008 reported "Particulate" activity (fission and activation products that are not gases) which included "Iodine" activity (for Peach Bottom, this is defined as the radioactive iodines I-131, I-133 and I-135). Additionally, it was discovered that the radioactive iodine activity only reported I-131 (contrary to the table, all three radioactive iodines must be included). The following is a correction to those sections of their respective reports.

Gaseous Effluents - Summation of All Releases

Corrected Period: January 1, 2007 through December 31, 2007

Unit: Peach Bottom

	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
B. Iodines						
1. Total I-131	Ci	8.00E-03	9.68E-03	1.39E-02	3.79E-03	1.76E+01
2. Average release For the Period	µCi/ s	1.03E-03	1.23E-03	1.75E-03	4.77E-04	
3. Percent of ODCM limit	%	*	*	*	*	

C. Particulate

1. Particulates with T1/2 > 8 days	Ci	1.69E-03	1.61E-03	1.18E-03	1.05E-03	1.94E+01
2. Average release For the Period	µCi/ s	2.18E-04	2.04E-04	1.48E-04	1.32E-04	
3. Percent of ODCM limit	%	*	*	*	*	

Gaseous Effluents - Summation of All Releases

Corrected Period: January 1, 2008 through December 31, 2008

Unit: Peach Bottom

	Units	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Est. Total Error %
B. Iodines						
1. Total I-131	Ci	4.95E-03	9.03E-03	1.11E-02	3.69E-03	1.76E+01
2. Average release For the Period	µCi/ s	6.30E-04	1.15E-03	1.39E-03	4.64E-04	
3. Percent of ODCM limit	%	*	*	*	*	

C. Particulate

1. Particulates with T1/2 > 8 days	Ci	1.87E-03	1.45E-03	6.22E-04	4.37E-04	1.94E+01
2. Average release For the Period	µCi/ s	2.37E-04	1.84E-04	7.83E-05	5.50E-05	
3. Percent of ODCM limit	%	*	*	*	*	

Correction to Previously-Reported Transfer and Processed Release of Water from Peach Bottom Decommissioned Unit 1 (SAFSTOR)

In 2013, the NRC conducted an inspection of the PBAPS Unit 1 which is the defueled and decommissioned facility in SAFSTOR status. This inspection included a record review of the water accounting that collects within Unit 1 because of condensation or small amounts of rain-water intrusion. When the Licensee encounters water within Unit 1 during its routine inspections, water is sampled, analyzed and contained in drums for transfer to the Unit 2 and 3 Liquid Radioactive Waste System for release.

However, the Inspector noted that the way Peach Bottom stated the accounting was not fully describing the transfer and release of the water because not all water transferred in a calendar year is released within that same calendar year. Peach Bottom did not have sufficient clarifying documentation to account explicitly in the report (both the Unit 1 Annual Decommissioning Report and the Annual Radioactive Effluent Release Report) to provide the level of detail to the satisfaction of the regulator. Peach Bottom Chemistry Department agreed with the Inspector and entered the issue into the Corrective Action Program for disposition.

The corrected data are provided in Table 14.

Table 14. Corrected Unit 1 Waste Transfer Data

	Transferred in Calendar Year (gallons)	Remaining from Last Year (gallons)	Released (gallons)	Remaining (gallons)	Total Tritium Activity Released (all water) (uCi)
2011	3.60E+03	0.00E+00	2.79E+03	8.09E+02	4.07E+03
2012	2.13E+02	8.09E+02	9.42E+02	8.00E+01	3.16E+03
2013	1.66E+02	8.00E+01	1.73E+02	7.30E+01	2.10E+03