

T.S. 6.9.1.8

April 27, 2010

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555Limerick Generating Station, Unit 1 and 2
Facility Operating License Nos. NPF-39 and NPF-85
NRC Docket Nos. 50-352 and 50-353 and 07200065

Subject: 2009 Annual Radioactive Effluent Release Report

Reference: Exelon Limerick Letter to NRC on ISFSI from 8/1/08 to 8/1/09 dated 9/25/09

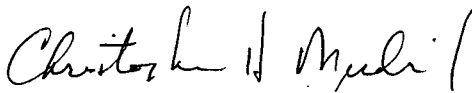
In accordance with Section 6.9.1.8 of Limerick Generating Station (LGS) Technical Specifications and Section 6.2 of the Offsite Dose Calculation Manual, attached is the 2009 Annual Radioactive Effluent Release Report No. 35 for LGS. Also attached is the Process Control Program, revision 7.

In accordance with 10CFR72.44(d)(3) Limerick has reviewed TLD data from the ISFSI modules currently loaded. During the period of August 1, 2009 to December 31, 2009, there were no liquid or gaseous effluent releases from the ISFSI at Limerick.

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,

Christopher H. Mudrick
Vice President-LGS
Exelon Generation Company, LLCAttachment: 1. 2009 Annual Radioactive Effluent Release Report No. 35 for LGS
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bcc: P. Cowan - KSA 3P (w/o Attachments)
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C. Mudrick - GML 5-1 (w/o Attachments)
E. Callan-GML 5-1(w/o Attachments)
S. Johnson-GML 5-1(w/o Attachments)
D. Helker - KSA 3P (w/o Attachments)
D. Merchant - GML 1-1 (w/Attachments)
J. Hunter III - SSB 2-4 (w/Attachments)
A. Columbus - SMB 1-2 (w/Attachments)
D. Wahl - SSB 2-3 (w/Attachments)
L. Birkmire - SSB 2-2 (w/Attachments)
D. Eisenhut - NSRB (w/Attachments)
M. Murphy - PADEP BRP (w/Attachments)
S. Focht - ANI (w/Attachments)



Nuclear



**Annual Radioactive Effluent Release Report
No. 35**

2009

Limerick Generating Station

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT

NO. 35

January 1, 2009 through December 31, 2009

EXELON GENERATION COMPANY, LLC

LIMERICK GENERATING STATION
UNITS NO. 1 AND 2

DOCKET NO. 50-352 (Unit 1)

DOCKET NO. 50-353 (Unit 2)

Submitted to
The United States Nuclear Regulatory Commission
Pursuant to
Facility Operating License:

NPF-39 (Unit 1)

NPF-85 (Unit 2)

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1. Introduction

In accordance with the reporting requirements of Technical Specification 6.9.1.8 applicable during the reporting period, this report summarizes the effluent release data for Limerick Generating Station Units 1 and 2 for the period January 1, 2009 through December 31, 2009. This submittal complies with the format described in Regulatory Guide 1.21, "Measuring, Evaluating and Reporting Radioactivity in Solid Wastes and Releases of Radioactive Materials in Liquid and Gaseous Effluents from Light-Water Cooled Nuclear Power Plants", Revision 1, June, 1974.

Meteorological data was reported in the format specified in Regulatory Guide 1.23, Revision 1, "Meteorological Monitoring Programs For Nuclear Power Plants".

All vendor results were received and included in the report calculations. Therefore the 2009 report is complete.

2. Supplemental Information

A. Regulatory Limits

	Limit	Units	Receptor	ODCM and 10 CFR 50, Appendix I Design Objective Limits
1. Noble Gases:				
a.	≤ 500 ≤ 3000	mrem/Yr mrem/Yr	Total Body Skin	ODCM Control 3.2.2.1.a
b.	≤ 10 ≤ 20	mRad mRad	Air Gamma Air Beta	Quarterly air dose limits ODCM Control 3.2.2.2.a
c.	≤ 20 ≤ 40	mRad mRad	Air Gamma Air Beta	Yearly air dose limits ODCM Control 3.2.2.2.b
d.	≤ 10 ≤ 30	mrem mrem	Total Body (Gamma) Skin (Beta)	10 CFR 50, Appendix I, Section II.B.2(b)
2. Iodines, Tritium, Particulates with Half Life > 8 days:				
a.	≤ 1500	mrem/Yr	Any Organ	ODCM Control 3.2.2.1.b
b.	≤ 15	mrem	Any Organ	Quarterly dose limits ODCM Control 3.2.2.3.a
c.	≤ 30	mrem	Any Organ	Yearly dose limits ODCM Control 3.2.2.3.b
3. Liquid Effluents				
a.	Concentration 10 CFR 20, Appendix B, Table 2 Col. 2			ODCM Control 3.2.1.1
b.	≤ 3 ≤ 10	mrem mrem	Total Body Any Organ	Quarterly dose limits ODCM Control 3.2.1.2.a
c.	≤ 6 ≤ 20	mrem mrem	Total Body Any Organ	Yearly dose limits ODCM Control 3.2.1.2.b
4. 40 CFR 190				
	≤ 25 ≤ 75	mrem mrem	Total Body or Organ Thyroid	Yearly dose limits ODCM Control 3.2.3

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B. Effluent Concentration Limits

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 ODCM Controls 3.2.2.2.a and 3.2.2.2.b.

The Effluent Concentration Limit (ECL) specified in 10 CFR 20, Appendix B, Table 2, Column 2 for identified nuclides, were used to calculate permissible release rates and concentrations for liquid release per the Limerick Offsite Dose Calculation Manual Control 3.2.1.1. The total activity concentration for all dissolved or entrained gases was limited to $< 2\text{E-}04 \mu\text{Ci/ml}$.

C. Average Energy ($\bar{E}$)

The Limerick ODCM limits the instantaneous 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. The average beta and gamma energies ($\bar{E}$) of the radionuclide mixture in releases of fission and activation gases as described in Regulatory Guide 1.21, "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," may be used to calculate doses in lieu of more sophisticated software. The Limerick radioactive effluent program employs the methodologies presented in U.S. 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," Revision 1, October 1977 and NUREG-0133, "Preparation of Radiological Effluent Technical Specifications for Nuclear Power Plants, October 1978. Therefore, average energies are not applicable to Limerick.

D. Measurements and Approximations of Total Radioactivity

1. Fission and Activation Gases

The method used for Gamma Isotopic Analysis is the Canberra Gamma Spectroscopy System with a gas Marinelli beaker. Airborne effluent gaseous activity was continuously monitored and recorded in accordance with ODCM Table 4.2-2. Additional vent grab samples were taken from the North Stack, Unit 1 South Stack and Unit 2 South Stack and analyzed at least monthly to determine the isotopic mixture of noble gas activity released for the month. The data from the noble gas radiation monitor were analyzed to report net noble gas effluent activity. When no activity was found in the grab isotopic analysis, the isotopic mixture was assumed to be that evaluated in the UFSAR (Section 11.5, Table 11.5-4). If activity was found in the grab isotopic analysis, the isotopic mixture for the Noble Gas Monitor was determined from that isotopic mixture.

Each month a monitor background was determined at the time of the noble gas grab sample and used to determine net radiation monitor activity. When no isotopic activity was identified in the grab noble gas sample, the noble gas radiation monitor 15-minute average data for one-hour prior to and one-hour post noble gas grab sampling were used to determine monitor background for the month. The mean plus two standard deviations was used as background for each Noble Gas Monitor. When activity was identified the background determination was made from the last month that no activity was found.

2. Particulates and Iodines

The method used for Gamma Isotopic Analysis is the Canberra Gamma Spectroscopy System with a particulate filter (47 mm) or charcoal cartridge, respectively. Particulate and iodine activity was continuously sampled and analyzed in accordance with ODCM Table 4.2-2. Charcoal and particulate samples are taken from the North Stack, Unit 1

South Stack, Unit 2 South Stack and the Hot Maintenance Shop exhausts and analyzed at least weekly to determine the total activity released from the plant based on the highest vent flow rates recorded for the sampling period.

3. Liquid Effluents

Each batch of liquid effluent was sampled and analyzed for gamma isotopic activity in accordance with ODCM Table 4.2-1 prior to release. The total activity of each released batch was determined by multiplying each nuclide's concentration by the total volume discharged and then summing. The total activity released during a month was then determined by summing the activity content of all batch releases discharged during the month.

4. Tritium in Liquid and Gaseous Effluents

Tritium in Liquid Effluents is analyzed using a Liquid Scintillation Counter.

Air from stack effluents was passed through two bubblers in series and an aliquot of the water from each bubbler was analyzed using a Liquid Scintillation Counter.

5. Composite Samples and Lower Limit of Detection (LLD)

Particulate air samples were composited quarterly and analyzed for gross alpha, Sr-89 and Sr-90. Liquid radwaste samples were composited monthly and quarterly and analyzed for gross alpha (monthly) and Fe-55, Sr-89 and Sr-90 (quarterly). These composites were submitted to an offsite vendor laboratory for analysis.

The ODCM required lower limit of detection for airborne and liquid releases are as follows:

Airborne:	LLD
Gross Alpha	1E-11 uCi/cc
Sr-89, Sr-90	1E-11 uCi/cc
I-131	1E-12 uCi/cc
I-133	1E-10 uCi/cc
Principal Gamma Emitters (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, I-131, Cs-134, Cs-137, Ce-141, Ce-144)	1E-11 uCi/cc
Noble Gas (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, Xe-135m, Xe-138)	1E-04 uCi/cc
H-3	1E-06 uCi/cc
Liquid:	
Principal Gamma Emitters (Mn-54, Fe-59, Co-58, Co-60, Zn-65, Mo-99, Cs-134, Cs-137, Ce-141, Ce-144)	5E-07 uCi/ml
I-131	1E-06 uCi/ml
Entrained Gases (Kr-87, Kr-88, Xe-133, Xe-133m, Xe-135, Xe-135m, Xe-138)	1E-05 uCi/ml
H-3	1E-05 uCi/ml
Gross Alpha	1E-07 uCi/ml
Sr-89, Sr-90	5E-08 uCi/ml
Fe-55	1E-06 uCi/ml

6. Estimated Total Error Present

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

E. Batch Releases

Liquid	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Batch Releases	38	34	39	35	146
Total time period for batch releases (min)	3.26E+03	2.84E+03	3.16E+03	2.84E+03	1.21E+04
Maximum time period for batch release (min)	1.20E+02	1.13E+02	9.60E+01	1.01E+02	1.20E+02
Average time period for batch release (min)	8.57E+01	8.34E+01	8.10E+01	8.10E+01	8.28E+01
Minimum time period for batch release (min)	5.50E+01	1.60E+01	4.00E+01	3.50E+01	1.60E+01
Average stream flow (Schuylkill River) during periods of release of effluents into a flowing stream (gpm)	2.42E+04	2.11E+04	2.19E+04	4.42E+04	2.42E+04

Aux Boiler Waste Oil Incineration	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Batch Releases	0	0	0	0	0
Total time period for batch releases (min)	0	0	0	0	0
Maximum time period for batch release (min)	0	0	0	0	0
Average time period for batch release (min)	0	0	0	0	0
Minimum time period for batch release (min)	0	0	0	0	0

Gaseous	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Batch Releases	0	0	0	0	0
Total time period for batch releases (min)	0	0	0	0	0
Maximum time period for batch release (min)	0	0	0	0	0
Average time period for batch release (min)	0	0	0	0	0
Minimum time period for batch release (min)	0	0	0	0	0

F. Abnormal Releases

1. Liquid	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Number of Releases	0	1	0	0	1
Total Activity Released (Ci)	0	7.47E-04	0	0	7.47E-04
2. Gaseous					
Number of Releases	0	0	0	0	0
Total Activity Released (Ci)	0	0	0	0	0

G. Spills

On February 13, 2009 a leak from the exterior walls of both U1 and U2 condenser bays was discovered via operator rounds (IR880716). The condensation was observed dripping directly to open ground and asphalt. Water samples were collected and analyzed for gamma isotopic and tritium. No gamma emitting nuclides were identified; however, tritium was identified at a concentration of 3.90E-03 uCi/ml.

Sampling of NPDES outfalls verified that no offsite release of tritium occurred. The release to ground occurred for up to six days until catch containments were installed. The total release of tritium to the ground was conservatively estimated at 1.23E-03 Curies. Groundwater sampling, as part of the radiological groundwater protection program (RGPP), has identified tritium in one down gradient well, MW-LM-9, at a maximum concentration of 1750 pCi/L, which is below the environmental lower limit of detection (LLD) of 2000 pCi/L.

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The leaks along the condenser bay joints were sealed with caulk and periodic inspections for future leaking has been added to operator rounds. All data related to this release was added to the Stations 10 CFR 50.75(g) decommissioning file.

On April 3, 2009 the water from the catch containments was released to the station's holding pond. The holding pond releases through the normal liquid effluent release point at outfall 001. The catch containment water contained approximately 747 uCi of tritium.

H. Revisions to the ODCM

There were no changes made to the ODCM in 2009

I. Radioactive Effluent Monitoring Instrumentation Out of Service for More Than 30 Days

Per ODCM Control 3.1.1, "Radioactive Liquid Effluent Monitoring Instrumentation" and Control 3.1.2 "Radioactive Gaseous Effluent Monitoring Instrumentation", instrumentation requires:

With less than the minimum number of radioactive gaseous effluent monitoring instrumentation channels OPERABLE, take the ACTION shown in Table 3.1-1 (liquids) or and Table 3.1-2 (gas). Restore the inoperable instrumentation to OPERABLE status within the time specified in the ACTION or explain in the next Annual Radioactive Effluent Release Report why this inoperability was not corrected within the time specified. The following is a discussion of instrumentation out of service for greater than 30 days:

As reported in the 2008 ARERR, the Liquid Radwaste effluent line flow indicator (FI-063-053) was declared inoperable on June 22, 2008 and remained inoperable through the end of 2008. Release flows were conservatively reduced to ensure that release flows did not exceed the ODCM limit of 255 gallons per minute.

The effluent line flow monitor was not repaired within the 30-day time frame was due to the complex troubleshooting that was required to determine the cause of the suspect flow readings. The flow orifice was eventually replaced, which required an engineering change request to evaluate the replacement. However, this did not eliminate the issue. Troubleshooting is continuing.

The Liquid Radwaste effluent line flow indicator (FI-063-053) remained inoperable until July 1, 2009 after Engineering completed their assessment (IR859104, A1692301). At no time did the discharge flow exceed the pre-release calculation criteria.

J. Independent Spent Fuel Storage Installation (ISFSI)

An Independent Spent Fuel Storage Installation (ISFSI) was placed in service starting July 21, 2008. In 2009 the dose to nearest resident to the ISFSI was non detectable using thermoluminescent dosimeters from the Radiological Environmental Monitoring Program.

K. Compliance to 40 CFR 190 Limits

The radioactive material released during this reporting period and the doses listed in this report were within the limits of the ODCM and 40 CFR 190. A detailed analysis of doses to Members of the Public is presented in Appendix C, Radiological Impact to Man.

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Appendix A Effluent and Waste Disposal Summary

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TABLE A-1 GASEOUS EFFLUENTS - SUMMATION OF ALL RELEASES

PERIOD 2009

Fission And Activation Gasses	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	6.35E+00	5.51E+00	1.31E+01	3.18E+00	2.82E+01	36.6
Average Release Rate for Period	uCi/sec	8.05E-01	6.99E-01	1.67E+00	4.03E-01	8.93E-01	
Dose - Gamma Air Dose	mrads	1.10E-02	7.07E-03	1.94E-02	3.91E-03	4.14E-02	
- Beta Air Dose	mrads	6.41E-03	4.25E-03	1.12E-02	2.36E-03	2.42E-02	
Percent of ODCM Limit - Gamma Air Dose	%	0.11	0.07	0.19	0.04	0.21	
- Beta Air Dose	%	0.03	0.02	0.06	0.01	0.06	

Radioiodines	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	7.85E-05	9.35E-06	< LLD	< LLD	8.78E-05	20.4
Average Release Rate for Period	uCi/sec	9.96E-06	1.19E-06	< LLD	< LLD	2.79E-06	
Percent of ODCM Limit	%	*	*	*	*	*	

Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	2.38E-05	2.50E-05	< LLD	< LLD	4.88E-05	22.6
Average Release Rate for Period	uCi/sec	3.02E-06	3.17E-06	< LLD	< LLD	1.55E-06	
Percent of ODCM Limit	%	*	*	*	*	*	
Gross Alpha Radioactivity	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	

Tritium	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	1.25E+01	5.42E+00	7.50E+00	7.96E+00	3.34E+01	15.7
Average Release Rate for Period	uCi/sec	1.59E+00	6.87E-01	9.51E-01	1.01E+00	1.07E+00	
Percent of ODCM Limit	%	*	*	*	*	*	

Iodine 131 & 133, Particulate & Tritium	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Organ Dose	mrem	2.19E-02	5.74E-03	7.35E-03	7.81E-03	3.68E-02
Percent of ODCM Limit	%	0.15	0.04	0.05	0.05	0.12

* ODCM Limit for combined Iodine, tritium and particulate only, which is shown in Item E.

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TABLE A-1A GASEOUS EFFLUENTS—GROUND-LEVEL RELEASE—BATCH MODE

PERIOD 2009

Fission And Activation Gasses	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Ar-41	Ci	N/A	N/A	N/A	N/A	N/A
Kr-85	Ci	N/A	N/A	N/A	N/A	N/A
Kr-85m	Ci	N/A	N/A	N/A	N/A	N/A
Kr-87	Ci	N/A	N/A	N/A	N/A	N/A
Kr-88	Ci	N/A	N/A	N/A	N/A	N/A
Xe-133	Ci	N/A	N/A	N/A	N/A	N/A
Xe-135	Ci	N/A	N/A	N/A	N/A	N/A
Xe-135m	Ci	N/A	N/A	N/A	N/A	N/A
Xe-138	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A

Radioiodines	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Annual
I-131	Ci	N/A	N/A	N/A	N/A	N/A
I-133	Ci	N/A	N/A	N/A	N/A	N/A
I-135	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A

Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Annual
Cr-51	Ci	N/A	N/A	N/A	N/A	N/A
Mn-54	Ci	N/A	N/A	N/A	N/A	N/A
Co-58	Ci	N/A	N/A	N/A	N/A	N/A
Co-60	Ci	N/A	N/A	N/A	N/A	N/A
Zn-65	Ci	N/A	N/A	N/A	N/A	N/A
Sr-89	Ci	N/A	N/A	N/A	N/A	N/A
Sr-90	Ci	N/A	N/A	N/A	N/A	N/A
Mo-99	Ci	N/A	N/A	N/A	N/A	N/A
Ag-110m	Ci	N/A	N/A	N/A	N/A	N/A
Cs-134	Ci	N/A	N/A	N/A	N/A	N/A
Cs-137	Ci	N/A	N/A	N/A	N/A	N/A
Ba-140	Ci	N/A	N/A	N/A	N/A	N/A
La-140	Ci	N/A	N/A	N/A	N/A	N/A
Ce-141	Ci	N/A	N/A	N/A	N/A	N/A
Ce-144	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A

H-3	Ci	N/A	N/A	N/A	N/A	N/A
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Gross Alpha	Ci	N/A	N/A	N/A	N/A	N/A
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TABLE A-1B GASEOUS EFFLUENTS – GROUND LEVEL RELEASE - CONTINUOUS MODE PERIOD 2009

Fission And Activation Gasses	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Kr-85m	Ci	1.20E-01	9.87E-02	2.31E-01	5.66E-02	5.07E-01
Kr-85	Ci	3.57E-01	1.23E-01	4.14E-01	5.83E-02	9.53E-01
Kr-87	Ci	1.92E-01	1.23E-01	3.14E-01	6.82E-02	6.97E-01
Kr-88	Ci	3.19E-01	1.67E-01	4.61E-01	8.90E-02	1.04E+00
Ar-41	Ci	1.06E-01	2.77E-01	9.40E-01	1.72E-01	1.49E+00
Xe-131m	Ci	8.95E-03	3.08E-03	1.04E-02	1.46E-03	2.39E-02
Xe-133	Ci	5.86E-01	1.45E+00	2.67E+00	8.97E-01	5.61E+00
Xe-135m	Ci	1.22E+00	1.30E+00	2.83E+00	7.68E-01	6.13E+00
Xe-135	Ci	1.59E+00	1.20E+00	2.89E+00	6.80E-01	6.36E+00
Xe-138	Ci	1.84E+00	7.69E-01	2.36E+00	3.87E-01	5.35E+00
Total	Ci	6.35E+00	5.51E+00	1.31E+01	3.18E+00	2.82E+01

Radioiodines	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
I-131	Ci	7.85E-05	9.35E-06	< LLD	< LLD	8.78E-05
I-133	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
I-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	7.85E-05	9.35E-06	< LLD	< LLD	8.78E-05

Particulates	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Annual
Cr-51	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mn-54	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-58	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-60	Ci	2.38E-05	< LLD	< LLD	< LLD	2.38E-05
Zn-65	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ag-110m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sb-125	Ci	< LLD	2.50E-05	< LLD	< LLD	2.50E-05
Cs-134	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Cs-137	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Ce-144	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	2.38E-05	2.50E-05	< LLD	< LLD	4.88E-05

H-3	Ci	1.25E+01	5.42E+00	7.50E+00	7.96E+00	3.34E+01
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Gross Alpha	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE A-2 LIQUID EFFLUENTS – SUMMATION OF ALL RELEASES

PERIOD 2009

Fission and Activation Products Excluding Tritium, Gases & Alpha)	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	6.63E-04	2.35E-03	3.89E-04	6.26E-04	4.03E-03	21.1
Average Concentration	uCi/ml	8.20E-09	3.81E-08	5.44E-09	4.92E-09	1.18E-08	
Dose - Whole Body	mrem	2.44E-01	1.17E-01	1.90E-01	2.23E-01	7.75E-01	
- Organ	mrem	2.44E-01	1.17E-01	1.90E-01	2.23E-01	7.75E-01	
% of ODCM Limit - Whole Body Dose*	%	8.15	3.91	6.32	7.44	12.91	
- Organ Dose*	%	2.44	1.17	1.90	2.23	3.87	

Tritium	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	7.33E+00	4.58E+00	5.40E+00	5.12E+00	2.24E+01	6.4
Average Concentration	uCi/ml	9.06E-05	7.41E-05	7.57E-05	4.02E-05	6.57E-05	
% of ODCM Limit - ECL	%	0.91%	0.74%	0.76%	0.40%	0.66%	

Dissolved and Entrained Gases	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	< LLD	< LLD	< LLD	3.63E-05	3.63E-05	21.1
Average Concentration	uCi/ml	N/A	N/A	N/A	2.85E-10	1.06E-10	
% of ODCM Limit - ECL	%	N/A	N/A	N/A	0.00%	0.00%	

Gross Alpha	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total Release	Ci	< LLD	< LLD	< LLD	< LLD	< LLD	23.0
Average Concentration	uCi/ml	N/A	N/A	N/A	N/A	N/A	

Volume of Waste Released	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total	Liters	2.20E+06	1.88E+06	2.18E+06	1.89E+06	8.14E+06	5.0

Volume of Dilution Water used during period	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total	Uncertainty (%)
Total	Liters	7.87E+07	5.99E+07	6.92E+07	1.25E+08	3.33E+08	3.6
Average Concentration	uCi/ml	N/A	N/A	N/A	N/A	N/A	

* Percent of limit includes gases and tritium.

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE A-2A LIQUID EFFLUENTS - BATCH MODE

PERIOD 2009

Fission and Activation Products	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Cr-51	Ci	6.24E-05	3.15E-04	< LLD	< LLD	3.78E-04
Mn-54	Ci	1.29E-04	3.02E-04	4.61E-05	2.30E-05	5.00E-04
Mn-56	Ci	< LLD	1.08E-06	< LLD	< LLD	1.08E-06
Co-58	Ci	3.00E-06	2.72E-05	< LLD	2.36E-05	5.38E-05
Fe-55	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Fe-59	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Co-60	Ci	4.28E-04	1.47E-03	2.65E-04	2.57E-04	2.42E-03
Zn-65	Ci	2.18E-05	1.83E-04	1.15E-05	2.71E-04	4.88E-04
Sr-89	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Sr-90	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Y-92	Ci	< LLD	1.27E-05	< LLD	< LLD	1.27E-05
Zr-95	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Nb-95	Ci	1.06E-06	1.04E-06	< LLD	< LLD	2.10E-06
Nb-97	Ci	< LLD	< LLD	< LLD	7.94E-07	7.94E-07
Mo-99	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
TC-99m	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
AG-110m	Ci	< LLD	8.64E-06	< LLD	< LLD	8.64E-06
Sb-124	Ci	< LLD	1.38E-05	8.09E-06	1.59E-06	2.35E-05
Sb-125	Ci	6.50E-06	7.24E-06	5.11E-05	4.42E-05	1.09E-04
I-131	Ci	< LLD	1.80E-06	< LLD	4.51E-07	2.25E-06
Cs-134	Ci	< LLD	2.26E-06	< LLD	< LLD	2.26E-06
Cs-137	Ci	1.13E-05	4.53E-06	6.69E-06	2.36E-06	2.49E-05
Ba-140	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
La-140	Ci	< LLD	< LLD	< LLD	1.54E-06	1.54E-06
Ce-141	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	6.63E-04	2.35E-03	3.89E-04	6.26E-04	4.03E-03

Dissolved and Entrained Gases	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Xe-131m	Ci	< LLD	< LLD	< LLD	3.02E-05	3.02E-05
Xe-133	Ci	< LLD	< LLD	< LLD	6.09E-06	6.09E-06
Xe-135	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
Total	Ci	< LLD	< LLD	< LLD	3.63E-05	3.63E-05

H-3	Ci	7.33E+00	4.58E+00	5.40E+00	5.12E+00	2.24E+01
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Gross Alpha	Ci	< LLD	< LLD	< LLD	< LLD	< LLD
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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

TABLE A-2B LIQUID EFFLUENTS - CONTINUOUS MODE

PERIOD 2009

Fission and Activation Products	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Cr-51	Ci	N/A	N/A	N/A	N/A	N/A
Mn-54	Ci	N/A	N/A	N/A	N/A	N/A
Fe-55	Ci	N/A	N/A	N/A	N/A	N/A
Co-58	Ci	N/A	N/A	N/A	N/A	N/A
Fe-59	Ci	N/A	N/A	N/A	N/A	N/A
Co-60	Ci	N/A	N/A	N/A	N/A	N/A
Zn-65	Ci	N/A	N/A	N/A	N/A	N/A
Sr-89	Ci	N/A	N/A	N/A	N/A	N/A
Sr-90	Ci	N/A	N/A	N/A	N/A	N/A
Zr-95	Ci	N/A	N/A	N/A	N/A	N/A
Nb-95	Ci	N/A	N/A	N/A	N/A	N/A
Mo-99	Ci	N/A	N/A	N/A	N/A	N/A
Tc-99m	Ci	N/A	N/A	N/A	N/A	N/A
Ag-110m	Ci	N/A	N/A	N/A	N/A	N/A
I-131	Ci	N/A	N/A	N/A	N/A	N/A
Cs-134	Ci	N/A	N/A	N/A	N/A	N/A
Cs-137	Ci	N/A	N/A	N/A	N/A	N/A
Ba-140	Ci	N/A	N/A	N/A	N/A	N/A
La-140	Ci	N/A	N/A	N/A	N/A	N/A
Ce-141	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A

Dissolved and Entrained Gases	Units	Qtr 1	Qtr 2	Qtr 3	Qtr 4	Total
Xe-131m	Ci	N/A	N/A	N/A	N/A	N/A
Xe-133	Ci	N/A	N/A	N/A	N/A	N/A
Xe-135	Ci	N/A	N/A	N/A	N/A	N/A
Total	Ci	N/A	N/A	N/A	N/A	N/A

H-3	Ci	N/A	N/A	N/A	N/A	N/A
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Gross Alpha	Ci	N/A	N/A	N/A	N/A	N/A
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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

Appendix B

Solid Waste and Irradiated Fuel Shipments

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

A. Solid waste shipped offsite for burial or disposal (not irradiated fuel) 01/01/2009 – 12/31/2009

1. Type of waste

Type of waste	Unit	12 Month Period	Estimated Error %
a. Spent resin, filters sludges, evaporator bottoms, etc	m ³	114.21	25%
	Ci	7.56E+02	
b. Dry compressible waste, contaminated equipment, etc.	m ³	87.39	25%
	Ci	4.74E+00	
c. Irradiated components, control rods, etc.	m ³	None	N/A
	Ci	None	
d. Other (Describe)	m ³	None	N/A
	Ci	None	

2. Estimate of Major Nuclide Composition (By Waste Type)

A. Category A – Spent Resin, Filters, Sludges, Evaporator Bottoms, etc.

Isotope	Waste Class A Curies *	Percent Abundance
C-14	2.77E-01	0.04%
Mn-54	4.05E+01	5.36%
Fe-55	4.99E+02	66.01%
Co-60	1.62E+02	21.42%
Ni-59	4.24E-02	0.01%
Ni-63	7.99E+00	1.06%
Zn-65	3.47E+01	4.59%
Sr-90	1.54E-01	0.02%
Cs-137	5.93E+00	0.78%
Ce-144	2.14E+00	0.28%
Pu-241	1.54E+00	0.20%
H-3	5.83E-01	0.08%
Cr-51	1.11E+00	0.15%
Totals	7.56E+02	100.00%

* Activity is estimated

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

B. Category B – Dry Compressible Waste, Contaminated Equipment, etc.

Isotope	Waste Class A Curies *	Percent Abundance
Mn-54	2.35E-01	4.96%
Fe-55	3.39E+00	71.61%
Co-60	9.20E-01	19.43%
Ni-63	4.79E-02	1.01%
Zn-65	7.60E-02	1.61%
Cs-137	1.40E-02	0.30%
Ce-144	5.10E-02	1.08%
TOTALS	4.74E+00	100.00%

* Activity is estimated

3. Solid Waste (Disposition)

Number of Shipments	Mode of Transportation	Destination
3	Truck	Studsvik (THOR) to Energy Solutions / Clive
41	Truck	Duratek to Energy Solutions / Clive
15	Truck	Limerick Gen. Sta. to Energy Solutions / Clive

4. Waste (Processing)

Number of Shipments	Mode of Transportation	Destination
37	Truck	Limerick to Duratek

5. Waste (Solidification)

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

Category A - 13 shipments Type A LSA
 Category A - 6 shipments > Type A LSA
 Category B - 33 shipments Type A LSA
 Category C - No shipments made
 Category D - No shipments made

B. Irradiated Fuel Shipments (disposition)

Number of Shipments	Mode of Transportation	Destination
0	N/A	N/A

C. Changes to the Process Control Program

Revision 7 of RW-AA-100, Process Control Program for Radioactive Wastes was active on 01/23/2009. The changes were administrative in nature. The revision corrected formatting issues and standardized the use of shall, should, may and will in accordance with AD-AA-101-1002. The record retention requirements were moved to section 5 and corrected references. A complete legible copy of this document is attached.

Appendix C Radiological Impact to Man

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Per ODCM Control 6.2, the Annual Radioactive Effluent Release Report shall include an assessment of the radiation doses to the hypothetically highest exposed MEMBER OF THE PUBLIC from reactor releases and other nearby uranium fuel cycle sources. For purposes of this calculation the following assumptions were made:

Gaseous

- Five year annual average meteorology and actual gaseous effluent releases were used.
- Gamma air dose, Beta air dose, Total Body and Skin doses were attributed to noble gas releases.
- Critical organ and age group dose attributed to iodine, particulate and tritium releases.
- The Receptor with the highest dose was the nearest residence in the ESE sector at 1004 meters ($x/Q = 2.27E-06 \text{ s/m}^3$, $D/Q = 1.88E-08 \text{ 1/m}^2$).
- 100 percent occupancy factor was assumed.
- For 40 CFR 190 compliance, the highest doses from the critical organ and critical age group for each release pathway was summed.
- Thermoluminescence Dosimetry (TLD) measurements (minus background levels) obtained from the Radiological Environmental Monitoring Program for the nearest residence to the Independent Spent Fuel Storage Installation (ISFSI) was used to determine direct radiation exposure.

A summary of gaseous and liquid radiation doses to members of the public at these locations was as follows:

Maximum Individual	Applicable Dose	Estimated Dose	Age Group	Location		% of Applicable Limit	Limit	Unit
				Distance (meters)	Direction (toward)			
Noble Gas								
Nearest Residence	Gamma Air Dose	2.17E-03	All	1004	ESE	0.011	20	mRad
Nearest Residence	Beta Air Dose	1.27E-03	All	1004	ESE	0.003	40	mRad
Nearest Residence	Total Body	2.06E-03	All	1004	ESE	0.021	10	mrem
Nearest Residence	Skin	3.42E-03	All	1004	ESE	0.011	30	mrem
Iodine, Particulate & Tritium								
Nearest Residence	Thyroid	6.06E-04	Teen	1004	ESE	0.002	30	mrem
Liquid	Total Body	7.75E-01	Child	Aqua PA		12.92	6	mrem
Liquid	Liver	7.75E-01	Child	Aqua PA		3.88	20	mrem

40 CFR 190 Compliance							
Pathway	Gaseous Effluents	Liquid Effluents	Direct Radiation	Total	% of Applicable Limit	Limit	Unit
Total Body Dose	2.06E-03	7.75E-01	0	7.77E-01	3.11	25	mrem
Organ Dose	6.06E-04	7.75E-01	0	7.76E-01	3.10	25	mrem

Doses calculated were well below all ODCM and 40 CFR Part 190 limits of 25 mrem to a real individual.

The ODCM does not require population doses to be calculated.

ODCM Control 6.2 also requires that the Annual Effluent Release Report shall include an assessment of the radiation doses from radioactive liquid and gaseous effluents to members of the public due to activities inside the Site Boundary during the report period. MEMBER OF THE PUBLIC shall include all persons not occupationally associated with the plant. This category does not include employees of the utility or contractors. Also excluded from this category are persons who enter the site to service equipment or to make deliveries. This category does include persons who use portions of the site for recreational,

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

occupational education, or other purposes not associated with the plant. A MEMBER OF THE PUBLIC may receive up to 100 mrem in a year (10CFR20.1301). Areas within the site boundary, where radiation dose of this type could occur include the Limerick Information Center on Longview Road near the rear exit of the plant, Frick's Lock on the south shore of the Schuylkill River and the railroad tracks that runs along the north shore of the River. The dose to State Police and National Guard personnel around the location of the Security Checkpoint was also included in this report. The radiation doses to Members of the Public have been estimated using methodology stated in the ODCM. The maximum gaseous dose to members of the public at these locations is based on the following assumptions:

- Five year annual average meteorology and actual effluent releases for the the sectors encompassing the Railroad Tracks (W), Information Center, Frick's Lock and the Security Checkpoint were used.
- Dose is from ground plane and inhalation only. No ingestion dose.
- Adult age group was used for the State Police and National Guard Dose.
- The maximum expected occupancy factor is 25% of a working year at all locations.

A summary of gaseous radiation doses to members of the public at these locations is as follows:

Location	Sector	Approx. Distance (meters)	x/Q s/m ³	D/Q 1/m ²	Total Body Dose mrem ⁽¹⁾	Iodine/Part/ H3 Organ Dose, mrem ⁽¹⁾
R.R. Tracks	W	225	2.53E-06	2.09E-08	2.38E-03	6.53E-04
Info. Center	ESE	884	6.55E-07	7.78E-09	6.55E-04	1.93E-04
Frick's Lock	WSW	450	5.27E-07	4.30E-09	4.99E-04	1.36E-04
National Guard / Security Check Point	NNE	682	2.37E-07	2.42E-09	3.57E-04	1.01E-04

Doses calculated were a small fraction of the 10 CFR 20.1301 limits.

Notes:

(1) The limit for sum of the Total Body Dose and Organ Dose = 100 mrem (ref. 10 CFR 20.1301)

Appendix D Meteorological Data

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SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
LICENSEE: EXELON GENERATION COMPANY, LLC

FORM 1
10/1/2018

10/1/2018
10/1/2018

1. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

2. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

3. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

4. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

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10/1/2018
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10/1/2018
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10/1/2018
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10/1/2018
10/1/2018

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10/1/2018
10/1/2018

12. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

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10/1/2018
10/1/2018

14. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

15. The following information is provided for the purpose of the public hearing on the proposed license renewal for the Limerick Generating Station, Units 1 and 2, located in Berks County, Pennsylvania.

10/1/2018
10/1/2018

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SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2009

Period of Record: January - March 2009
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	2	0	0	0	3
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	2	0	0	0	0	2
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	1	0	0	0	1
S	0	8	1	0	0	0	9
SSW	0	10	7	0	0	0	17
SW	0	8	1	0	0	0	9
WSW	0	4	3	0	0	0	7
W	1	7	1	1	0	0	10
WNW	0	7	13	7	0	0	27
NW	1	2	11	1	0	0	15
NNW	0	0	2	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	2	49	42	9	0	0	102

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: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March, 2009
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	2	0	0	0	3
NNE	0	2	0	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	1	0	0	0	0	1
E	0	0	0	0	0	0	0
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	0	1	0	1	0	0	2
SSW	0	13	2	0	0	0	15
SW	1	2	0	0	0	0	3
WSW	0	1	1	0	0	0	2
W	1	3	1	0	0	0	5
WNW	1	10	7	1	0	0	19
NW	1	7	23	12	3	0	46
NNW	1	3	6	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	5	46	42	14	3	0	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: 34

SITE: LIMERICK GENERATING STATION—UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-12: Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2009

Limerick Tower 1

Period of Record: January - March 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	9	6	0	0	0	15
NNE	2	1	0	0	0	0	3
NE	0	1	0	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	2	1	0	0	0	3
ESE	0	1	0	0	0	0	1
SE	0	2	0	0	0	0	2
SSE	0	3	0	0	0	0	3
S	2	6	1	1	0	0	10
SSW	1	7	1	0	0	0	9
SW	1	4	0	0	0	0	5
WSW	0	4	0	0	0	0	4
W	0	4	3	2	2	0	11
WNW	2	3	4	7	1	0	17
NW	1	8	17	20	0	0	46
NNW	0	3	7	4	0	0	14
Variable	0	0	0	0	0	0	0
Total	9	58	40	34	3	0	144

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: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March 2009
 Stability Class - Neutral
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	10	23	20	10	0	0	54
NNE	18	14	0	0	0	0	32
NE	16	28	0	0	0	0	44
ENE	10	31	5	0	0	0	46
E	11	23	19	0	0	0	53
ESE	9	5	4	0	0	0	18
SE	6	12	10	0	0	0	19
SSE	6	30	4	0	0	0	40
S	10	28	7	18	0	0	46
SSW	7	29	8	0	0	0	44
SW	9	9	0	0	0	0	18
WSW	10	6	0	0	0	0	16
W	14	12	16	9	1	0	52
WNW	13	44	80	31	4	0	172
NW	14	61	121	73	5	0	274
NNW	7	25	44	11	0	0	87
Variable	0	0	0	0	0	0	0
Total	170	380	329	126	10	0	1015

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: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March, 2009

Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	7	3	1	0	0	0	11
NNE	8	0	0	0	0	0	8
NE	10	1	0	0	0	0	11
ENE	8	8	0	0	0	0	16
E	10	6	1	0	0	0	17
ESE	2	7	1	0	0	0	10
SE	3	15	3	0	0	0	21
SSE	4	10	5	0	0	0	19
S	15	24	1	0	0	0	40
SSW	21	23	3	0	0	0	47
SW	27	5	3	0	0	0	35
WSW	28	7	7	0	0	0	42
W	34	27	6	0	0	0	67
WNW	26	37	9	2	0	0	74
NW	31	25	9	1	0	0	66
NNW	4	19	2	0	0	0	25
Variable	2	1	0	0	0	0	3
Total	240	218	51	3	0	0	512

Hours of calm in this stability class: 5
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 34

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2009

Limerick Tower 1

Period of Record: January – March 2009

Stability Class – Moderately Stable – 171Ft-26Ft Delta-T (F)

Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	6	2	0	0	0	0	8
NNE	3	0	0	0	0	0	3
NE	7	0	0	0	0	0	7
ENE	10	0	0	0	0	0	10
E	6	1	0	0	0	0	7
ESE	7	0	0	0	0	0	7
SE	4	1	0	0	0	0	5
SSE	0	2	0	0	0	0	2
S	2	5	0	0	0	0	7
SSW	7	0	0	0	0	0	7
SW	5	1	0	0	0	0	6
WSW	5	0	0	0	0	0	5
W	11	2	0	0	0	0	13
WNW	14	5	0	0	0	0	19
NW	8	1	0	0	0	0	9
NNW	4	0	0	0	0	0	4
Variable	8	0	0	0	0	0	8
Total	107	20	0	0	0	0	127

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: 34

SITE: LIMERICK GENERATING STATION—UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-1a: Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2009

Limerick Tower 1

Period of Record: January - March 2009
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 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	7	0	0	0	0	0	7
NE	9	0	0	0	0	0	9
ENE	5	0	0	0	0	0	5
E	4	0	0	0	0	0	4
ESE	2	0	0	0	0	0	2
SE	1	0	0	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	1	0	0	0	0	0	1
WSW	3	1	0	0	0	0	4
W	14	0	0	0	0	0	14
WNW	16	0	0	0	0	0	16
NW	9	0	0	0	0	0	9
NNW	5	0	0	0	0	0	5
Variable	5	0	0	0	0	0	5
Total	89	1	0	0	0	0	90

Hours of calm in this stability class: 17
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D.-2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March 2009
 Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	0	3	0	0	0	4
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	1	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	1	7	1	0	0	9
SSW	0	5	7	6	0	0	18
SW	0	4	6	1	0	0	11
WSW	0	1	4	4	0	0	9
W	0	4	4	0	1	1	10
WNW	0	5	8	11	1	6	31
NW	0	0	1	4	0	0	5
NNW	0	0	3	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	1	21	44	27	2	7	102

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: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March 2009

Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	4	2	0	0	7
NNE	0	2	1	0	0	0	3
NE	0	0	0	0	0	0	0
ENE	0	0	1	0	0	0	1
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	1	0	0	0	1
SSE	0	0	0	0	0	0	0
S	0	1	1	0	0	0	2
SSW	0	8	7	1	2	0	18
SW	0	2	0	0	0	0	2
WSW	0	0	0	1	0	0	1
W	1	5	3	1	0	0	10
WNW	0	5	10	13	3	2	33
NW	0	1	6	12	4	1	24
NNW	0	3	2	3	0	0	8
Variable	0	0	0	0	0	0	0
Total	1	28	36	33	9	3	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: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	3	12	1	0	0	17
NNE	0	3	1	0	0	0	4
NE	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	1	1	0	0	0	2
ESE	0	1	1	0	0	0	2
SE	0	2	0	0	0	0	2
SSE	0	1	0	0	0	0	1
S	0	6	5	0	1	0	12
SSW	0	4	5	1	0	0	10
SW	0	1	4	0	0	0	5
WSW	1	0	2	2	0	0	5
W	0	3	2	1	4	5	15
WNW	2	0	7	15	3	4	31
NW	0	2	4	10	7	0	23
NNW	1	2	2	6	3	0	14
Variable	0	0	0	0	0	0	0
Total	5	29	47	36	18	9	144

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: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-20 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March 2009
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	>24	
N	6	18	24	20	2	0	70
NNE	6	12	11	2	0	0	31
NE	13	21	12	0	0	0	46
ENE	9	21	18	0	0	0	48
E	7	12	26	8	0	0	53
ESE	6	7	7	3	0	0	23
SE	5	6	5	1	0	0	17
SSE	4	7	22	4	0	0	37
S	3	14	32	5	1	0	55
SSW	6	14	19	5	4	0	48
SW	0	12	5	0	0	0	17
WSW	2	6	4	2	0	1	15
W	5	15	10	16	15	9	70
WNW	5	17	55	92	50	16	235
NW	5	19	40	61	30	5	160
NNW	4	10	45	23	9	0	91
Variable	0	0	0	0	0	0	0
Total	86	211	335	242	111	31	1016

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: 34

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2009

Limerick Tower 1

Period of Record: January – March 2009

Stability Class – Slightly Stable – 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	3	6	1	0	0	11
NNE	4	3	1	0	0	0	8
NE	4	4	1	0	0	0	9
ENE	4	6	5	0	0	0	15
E	6	2	5	0	0	0	13
ESE	3	5	2	0	0	0	10
SE	4	2	4	2	0	0	12
SSE	3	6	20	4	0	0	33
S	2	8	26	8	0	0	44
SSW	1	20	24	6	1	0	52
SW	1	16	14	4	1	0	36
WSW	0	17	4	6	3	1	31
W	5	21	20	6	3	0	55
WNW	4	32	52	10	4	1	103
NW	5	15	26	4	0	0	50
NNW	1	10	22	1	0	0	34
Variable	0	0	0	0	0	0	0
Total	48	170	232	52	12	2	516

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: 34

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 2 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January – March, 2009

Limerick Tower 1

Period of Record: January – March 2009
 Stability Class – Moderately Stable – 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	2	4	0	0	0	6
NNE	1	2	0	0	0	0	3
NE	0	1	0	0	0	0	1
ENE	1	0	0	0	0	0	1
E	1	5	0	0	0	0	6
ESE	3	2	0	0	0	0	5
SE	0	6	0	0	0	0	6
SSE	2	6	1	1	0	0	10
S	3	6	1	0	0	0	10
SSW	2	6	2	0	0	0	10
SW	2	5	4	0	0	0	11
WSW	2	7	3	0	0	0	12
W	1	5	2	2	0	0	10
WNW	1	6	12	1	0	0	20
NW	5	7	2	0	0	0	14
NNW	0	5	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	24	71	31	4	0	0	130

Hours of calm in this stability class: 10
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 34

SITE: LIMERICK GENERATING STATION -- UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 2. Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - March, 2009

Limerick Tower 1

Period of Record: January - March 2009

Stability Class -- Extremely Stable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

		Wind Speed (in mph)						Total
Wind Direction		1-3	4-7	8-12	13-18	19-24	>24	
N		2	1	0	0	0	0	3
NNE		1	0	0	0	0	0	1
NE		2	0	0	0	0	0	2
ENE		6	3	0	0	0	0	9
E		4	0	0	0	0	0	4
ESE		3	3	0	0	0	0	6
SE		2	1	0	0	0	0	3
SSE		4	3	0	0	0	0	7
S		2	3	0	0	0	0	5
SSW		2	7	0	0	0	0	9
SW		1	7	4	1	0	0	13
WSW		2	6	5	0	0	0	13
W		1	2	1	0	0	0	4
WNW		1	11	0	0	0	0	12
NW		5	2	0	0	0	0	7
NNW		3	3	0	0	0	0	6
Variable		2	0	0	0	0	0	2
Total		43	52	10	1	0	0	106

Hours of calm in this stability class: 01

Hours of missing wind measurements in this stability class: 0

Hours of missing stability measurements in all stability classes: 34

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 30 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	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	0	0	0	0	0	0
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	3	2	0	0	0	5
SSW	0	11	2	0	0	0	13
SW	0	8	0	0	0	0	8
WSW	0	5	5	0	0	0	10
W	0	9	6	0	0	0	15
WNW	0	4	3	0	1	0	8
NW	0	1	0	0	0	0	1
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	42	19	0	1	0	62

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 10
 Hours of missing stability measurements in all stability classes: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 30 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	1	0	0	0	0	1
NE	0	1	0	0	0	0	1
ENE	0	1	2	0	0	0	3
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	1	0	0	0	0	1
S	0	3	1	0	0	0	4
SSW	0	6	0	0	0	0	6
SW	1	3	0	0	0	0	4
WSW	0	4	4	0	0	0	8
W	2	4	2	1	0	0	9
WNW	0	5	9	2	1	0	17
NW	0	1	2	4	0	0	7
NNW	0	2	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	3	32	21	7	1	0	64

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: 144

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-3: Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	1	4	3	0	0	0	8
NNE	0	3	0	0	0	0	3
NE	1	2	0	0	0	0	3
ENE	0	0	1	0	0	0	1
E	0	2	5	0	0	0	7
ESE	0	1	1	0	0	0	2
SE	0	1	0	0	0	0	1
SSE	0	4	0	0	0	0	4
S	0	6	3	0	0	0	9
SSW	1	13	0	0	0	0	14
SW	2	8	1	0	0	0	11
WSW	3	6	4	0	0	0	13
W	3	6	4	0	0	0	13
WNW	1	3	10	1	2	0	17
NW	0	7	7	3	0	0	17
NNW	0	0	2	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	12	66	41	4	2	0	125

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: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D.- 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower: 1

Period of Record: April - June 2009

Stability Class - Neutral - 171Ft-26Ft Delta-T (F)

Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	>24	
N	3	13	7	1	0	0	24
NNE	6	16	1	0	0	0	23
NE	14	20	3	0	0	0	37
ENE	13	24	8	0	0	0	45
E	11	48	30	4	0	0	93
ESE	2	12	12	3	0	0	29
SE	4	9	0	0	0	0	13
SSE	6	12	0	0	0	0	18
S	9	18	6	2	0	0	35
SSW	6	22	2	0	0	0	30
SW	10	11	2	0	0	0	23
WSW	12	15	2	0	0	0	29
W	14	13	12	7	0	0	46
WNW	10	22	26	8	1	0	67
NW	3	31	36	8	0	0	78
NNW	8	18	29	5	0	0	60
Variable	0	0	0	0	0	0	0
Total	131	304	176	38	1	0	650

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: 144

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-3a Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	20	16	4	0	0	0	40
NNE	12	12	0	0	0	0	24
NE	26	29	1	0	0	0	56
ENE	24	33	6	0	0	0	63
E	26	36	24	6	0	0	92
ESE	7	19	7	0	0	0	33
SE	6	18	1	0	0	0	25
SSE	12	23	5	0	0	0	40
S	11	29	9	0	0	0	49
SSW	12	17	0	0	0	0	29
SW	23	12	3	0	0	0	38
WSW	23	11	2	0	0	0	36
W	27	17	11	3	0	0	58
WNW	26	25	17	6	0	0	74
NW	20	23	15	1	0	0	59
NNW	9	25	9	3	0	0	46
Variable	4	0	0	0	0	0	4
Total	288	345	114	19	0	0	766

Hours of calm in this stability class: 8
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 144

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 3 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April – June, 2009

Limerick Tower 1

Period of Record: April – June 2009

Stability Class – Moderately Stable – 171Ft-26Ft Delta-T (F)

Winds Measured at: 30 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	3	1	0	0	0	0	4
NE	2	2	0	0	0	0	4
ENE	8	0	0	0	0	0	8
E	3	1	0	0	0	0	4
ESE	3	2	0	0	0	0	5
SE	5	0	0	0	0	0	5
SSE	8	3	0	0	0	0	11
S	8	4	0	0	0	0	12
SSW	11	8	0	0	0	0	19
SW	12	1	0	0	0	0	13
WSW	15	0	0	0	0	0	15
W	26	3	0	0	0	0	29
WNW	29	4	0	0	0	0	33
NW	17	4	0	0	0	0	21
NNW	8	0	0	0	0	0	8
Variable	5	0	0	0	0	0	5
Total	167	33	0	0	0	0	200

Hours of calm in this stability class: 12
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-3-30 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	0	0	0	0	0	5
NNE	3	0	0	0	0	0	3
NE	7	0	0	0	0	0	7
ENE	4	0	0	0	0	0	4
E	2	0	0	0	0	0	2
ESE	2	0	0	0	0	0	2
SE	4	0	0	0	0	0	4
SSE	2	0	0	0	0	0	2
S	3	0	0	0	0	0	3
SSW	2	0	0	0	0	0	2
SW	6	0	0	0	0	0	6
WSW	6	0	0	0	0	0	6
W	13	0	0	0	0	0	13
WNW	22	4	0	0	0	0	26
NW	31	1	0	0	0	0	32
NNW	14	0	0	0	0	0	14
Variable	10	0	0	0	0	0	10
Total	136	5	0	0	0	0	141

Hours of calm in this stability class: 112
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 144

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Speed (in mph)							
Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	1	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	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	1	0	0	0	1
SSW	0	2	11	2	0	0	15
SW	0	0	6	3	0	0	9
WSW	0	2	4	9	0	0	15
W	0	2	6	4	1	0	13
WNW	0	1	2	1	1	1	6
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	0	8	31	20	2	1	62

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: 144

SITE: LIMERICK GENERATING STATION—UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower #1

Period of Record: April - June 2009

Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	0	1	0	0	2
NNE	0	1	1	0	0	0	2
NE	0	0	0	0	0	0	0
ENE	0	0	2	0	0	0	2
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	2	0	0	0	2
SSW	0	3	4	0	0	0	7
SW	0	2	3	0	0	0	5
WSW	1	2	2	4	0	0	9
W	0	5	2	6	1	2	16
WNW	0	1	7	2	3	1	14
NW	0	0	0	0	3	0	3
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	1	17	23	13	7	3	64

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: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-4: Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	2	3	0	0	6
NNE	0	6	0	0	0	0	6
NE	0	0	1	0	0	0	1
ENE	1	0	1	0	0	0	2
E	0	0	7	0	0	0	7
ESE	0	0	0	1	0	0	1
SE	0	1	0	0	0	0	1
SSE	0	1	2	0	0	0	3
S	0	3	2	2	0	0	7
SSW	0	3	9	1	0	0	13
SW	0	7	7	1	0	0	15
WSW	0	4	4	5	0	0	13
W	0	3	3	6	2	0	14
WNW	2	4	7	6	2	2	23
NW	0	1	8	0	2	0	11
NNW	1	0	1	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	4	34	54	25	6	2	125

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: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-40: Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Neutral - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	6	14	9	1	0	32
NNE	5	13	4	1	0	0	23
NE	6	21	11	0	0	0	38
ENE	5	16	7	2	0	0	30
E	8	30	31	17	0	0	86
ESE	1	12	19	13	3	0	48
SE	2	5	7	0	0	0	14
SSE	4	9	7	0	0	0	20
S	2	8	10	4	2	0	26
SSW	4	10	17	10	0	0	41
SW	3	7	7	7	0	0	24
WSW	7	9	9	5	2	0	32
W	5	11	13	13	6	6	54
WNW	5	17	23	14	16	4	79
NW	3	4	25	13	5	0	50
NNW	0	12	22	19	0	0	53
Variable	0	0	0	0	0	0	0
Total	62	190	226	127	35	10	650

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: 144

SITE: LIMERICK GENERATING STATION--UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-4 - Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1							
Period of Record: April - June 2009							
Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)							
Winds Measured at 175 Feet							
Wind Speed (in mph)							
Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	8	6	25	3	0	0	42
NNE	8	11	9	0	0	0	28
NE	12	20	14	0	0	0	46
ENE	12	38	17	1	0	0	68
E	8	25	34	11	4	0	82
ESE	5	20	21	14	0	0	60
SE	3	6	14	3	0	0	26
SSE	4	8	23	2	0	0	37
S	4	15	25	9	0	0	53
SSW	2	12	15	9	0	0	38
SW	3	17	23	4	0	0	47
WSW	3	13	9	2	3	0	30
W	8	13	21	10	4	3	59
WNW	2	21	24	19	9	1	76
NW	4	9	16	4	0	0	33
NNW	3	14	19	10	3	0	49
Variable	0	0	0	0	0	0	0
Total	89	248	309	101	23	4	774

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: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	4	2	0	0	0	0	6
NNE	2	0	0	1	0	0	3
NE	2	3	2	0	0	0	7
ENE	3	2	0	0	0	0	5
E	0	2	0	0	0	0	2
ESE	3	2	0	1	0	0	6
SE	5	0	0	0	0	0	5
SSE	3	3	0	0	0	0	6
S	1	7	1	0	0	0	9
SSW	1	10	10	4	0	0	25
SW	3	16	12	1	0	0	32
WSW	1	10	4	1	0	0	16
W	1	14	4	0	0	0	19
WNW	3	19	12	0	0	0	34
NW	3	12	10	0	0	0	25
NNW	3	6	2	0	0	0	11
Variable	1	0	0	0	0	0	1
Total	39	108	57	8	0	0	212

Hours of calm in this stability class: 10
 Hours of missing wind measurements in this stability class: 0
 Hours of missing stability measurements in all stability classes: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
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Table D - 4 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, April - June, 2009

Limerick Tower 1

Period of Record: April - June 2009

Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 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	2	1	0	0	0	0	3
NE	1	2	0	0	0	0	3
ENE	0	3	0	0	0	0	3
E	5	1	2	0	0	0	8
ESE	1	1	0	0	0	0	2
SE	1	2	0	0	0	0	3
SSE	0	0	0	0	0	0	0
S	1	4	0	0	0	0	5
SSW	3	11	0	0	0	0	14
SW	2	6	4	0	0	0	12
WSW	5	6	0	0	0	0	11
W	4	14	1	0	0	0	19
WNW	4	22	12	2	0	0	40
NW	5	12	6	0	0	0	23
NNW	1	2	0	0	0	0	3
Variable	1	0	0	0	0	0	1
Total	36	90	25	2	0	0	153

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: 144

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction Total	Wind Speed (in mph)						
	1-3	4-7	8-12	13-18	19-24	> 24	
N	10	10	3	0	0	0	14
NNE	0	17	2	0	0	0	19
NE	1	23	1	0	0	0	25
ENE	2	14	3	0	0	0	19
E	3	3	0	0	0	0	6
ESE	3	2	2	0	0	0	7
SE	2	2	0	0	0	0	4
SSE	0	2	0	0	0	0	2
S	3	9	2	0	0	0	14
SSW	7	18	1	0	0	0	26
SW	6	19	1	0	0	0	26
WSW	8	15	2	0	0	0	25
W	7	37	2	0	0	0	46
WNW	3	25	5	0	0	0	33
NW	1	18	9	0	0	0	28
NNW	1	5	0	0	0	0	6
Variable	1	0	0	0	0	0	1
Total	49	219	33	0	0	0	301

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 9
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D -- 5. Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Moderately Unstable - 171Ft-25Ft Delta-T (F)

Winds Measured at 30 Feet

Wind Direction Total	Wind Speed (in mph)						
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	2	0	0	0	0	4
NNE	0	2	0	0	0	0	2
NE	1	7	4	0	0	0	12
ENE	0	4	0	0	0	0	4
E	0	2	0	0	0	0	2
ESE	0	1	0	0	0	0	1
SE	1	1	0	0	0	0	2
SSE	0	1	0	0	0	0	1
S	1	1	1	1	0	0	4
SSW	0	0	1	0	0	0	1
SW	2	2	0	0	0	0	4
WSW	5	0	1	0	0	0	6
W	6	2	1	0	0	0	9
WNW	1	14	5	0	0	0	20
NW	2	14	9	0	0	0	25
NNW	3	2	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	24	55	22	1	0	0	102

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: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-5-1 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction Total	Wind Speed (in mph)					
	1-3	4-7	8-12	13-18	19-24	> 24
N	2	3	0	0	0	5
NNE	1	7	0	0	0	8
NE	1	6	0	0	0	7
ENE	0	7	0	0	0	7
E	1	1	2	0	0	4
ESE	1	0	0	0	0	1
SE	2	0	0	0	0	2
SSE	4	1	0	0	0	5
S	1	2	0	0	0	3
SSW	0	5	1	0	0	6
SW	3	5	0	0	0	8
WSW	4	8	0	0	0	12
W	7	3	0	0	0	10
WNW	3	7	1	0	0	11
NW	2	14	17	0	0	33
NNW	1	0	1	0	0	2
Variable	0	0	0	0	0	0
Total	33	69	22	0	0	124

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 6
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-- 5. Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Neutral
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	13	18	2	0	0	0	33
NNE	12	19	12	2	0	0	45
NE	10	17	1	0	0	0	28
ENE	7	36	3	0	0	0	46
E	8	24	4	0	0	0	36
ESE	2	7	0	0	0	0	9
SE	2	0	0	0	0	0	2
SSE	7	2	0	0	0	0	9
S	7	5	3	0	0	0	15
SSW	4	13	1	0	0	0	18
SW	13	7	0	0	0	0	20
WSW	16	7	0	0	0	0	23
W	11	12	3	0	0	0	26
WNW	12	19	5	0	0	0	36
NW	18	35	18	1	0	0	72
NNW	18	6	0	0	0	0	24
Variable	0	0	0	0	0	0	0
Total	160	227	52	3	0	0	442

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 11
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009
 Stability Class - Slightly Stable: 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	>24	
N	21	6	0	0	0	0	27
NNE	26	19	1	0	0	0	46
NE	33	10	2	0	0	0	45
ENE	24	14	2	0	0	0	40
E	15	16	4	0	0	0	35
ESE	7	5	0	0	0	0	12
SE	7	3	0	0	0	0	10
SSE	9	19	0	0	0	0	28
S	9	29	0	0	0	0	38
SSW	17	13	0	0	0	0	30
SW	18	2	0	0	0	0	20
WSW	30	6	1	0	0	0	37
W	46	24	1	0	0	0	71
WNW	60	37	0	0	0	0	97
NW	34	18	5	0	0	0	57
NNW	34	8	1	0	0	0	43
Variable	2	0	0	0	0	0	2
Total	392	229	17	0	0	0	638

Hours of calm in this stability class: 9
 Hours of missing wind measurements in this stability class: 133
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 5 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009
 Stability Class - Moderately Stable
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	8	1	0	0	0	0	9
NNE	6	1	0	0	0	0	7
NE	6	0	0	0	0	0	6
ENE	7	1	0	0	0	0	8
E	3	0	0	0	0	0	3
ESE	4	1	0	0	0	0	5
SE	3	0	0	0	0	0	3
SSE	3	0	0	0	0	0	3
S	4	4	0	0	0	0	8
SSW	9	2	0	0	0	0	11
SW	14	0	0	0	0	0	14
WSW	20	0	0	0	0	0	20
W	44	2	0	0	0	0	46
WNW	63	3	0	0	0	0	66
NW	43	3	0	0	0	0	46
NNW	20	1	0	0	0	0	21
Variable	5	0	0	0	0	0	5
Total	262	19	0	0	0	0	281

Hours of calm in this stability class: 14
 Hours of missing wind measurements in this stability class: 25
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-5: Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	16	0	0	0	0	0	16
NNE	4	0	0	0	0	0	4
NE	4	0	0	0	0	0	4
ENE	5	0	0	0	0	0	5
E	1	0	0	0	0	0	1
ESE	2	0	0	0	0	0	2
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	1	0	0	0	0	0	1
SSW	4	0	0	0	0	0	4
SW	8	0	0	0	0	0	8
WSW	4	0	0	0	0	0	4
W	16	1	0	0	0	0	17
WNW	33	1	0	0	0	0	34
NW	29	0	0	0	0	0	29
NNW	34	0	0	0	0	0	34
Variable	4	0	0	0	0	0	4
Total	166	2	0	0	0	0	168

Hours of calm in this stability class: 24
 Hours of missing wind measurements in this stability class: 3
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 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	0	10	12	0	0	0	22
NE	1	19	7	0	0	0	27
ENE	1	9	7	0	0	0	17
E	0	3	6	0	0	0	9
ESE	0	1	1	0	0	0	2
SE	2	1	0	3	0	0	6
SSE	2	3	1	0	0	0	6
S	3	3	2	1	2	0	11
SSW	1	6	16	1	0	0	24
SW	3	8	8	1	0	0	20
WSW	0	11	9	2	3	0	25
W	2	15	29	12	0	0	58
WNW	3	10	12	1	0	0	26
NW	1	4	12	0	0	0	17
NNW	1	1	2	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	20	109	129	21	5	0	284

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 26
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION -- UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-6: Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction Total	Wind Speed (in mph)					
	1-3	4-7	8-12	13-18	19-24	> 24
N	0	1	0	0	0	1
NNE	0	3	0	0	0	3
NE	0	4	3	0	0	7
ENE	0	6	3	0	0	9
E	1	1	1	0	0	3
ESE	0	0	0	0	0	0
SE	0	1	1	0	0	2
SSE	0	0	0	0	0	0
S	0	3	0	2	0	5
SSW	0	0	1	1	1	3
SW	0	0	3	0	0	3
WSW	0	3	1	0	1	5
W	1	4	5	4	1	15
WNW	4	7	8	2	0	21
NW	2	7	12	0	0	21
NNW	1	2	2	0	0	5
Variable	0	0	0	0	0	0
Total	9	42	40	9	3	103

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: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower, 1

Period of Record: July - September 2009
 Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction Total	Wind Speed (in mph)						
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	0	0	0	0	3
NNE	1	5	1	0	0	0	7
NE	0	5	5	0	0	0	10
ENE	0	5	0	0	0	0	5
E	1	3	2	0	0	0	6
ESE	1	0	0	1	0	0	2
SE	3	0	0	0	0	0	3
SSE	0	2	0	0	0	0	2
S	0	4	0	0	0	0	4
SSW	2	3	4	2	0	0	11
SW	0	1	5	0	0	0	6
WSW	2	5	6	0	0	0	13
W	3	3	4	1	0	0	11
WNW	2	3	9	4	0	0	18
NW	0	6	14	2	0	0	22
NNW	0	1	1	1	0	0	3
Variable	0	0	0	0	0	0	0
Total	15	49	51	11	0	0	126

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: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September, 2009

Stability Class - Neutral - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction Total	Wind Speed (in mph)						
	1-3	4-7	8-12	13-18	19-24	>24	
N	8	9	6	0	0	0	23
NNE	5	12	14	9	0	0	40
NE	7	18	6	5	2	0	38
ENE	7	26	17	0	0	0	50
E	5	11	21	1	0	0	38
ESE	1	5	9	3	0	0	18
SE	4	1	4	0	0	0	9
SSE	0	4	1	0	0	0	5
S	1	6	5	0	0	0	12
SSW	6	5	10	6	1	0	28
SW	2	15	2	0	0	0	19
WSW	5	5	7	2	1	0	20
W	11	9	7	6	1	0	34
WNW	6	13	16	10	0	0	45
NW	3	11	20	7	0	0	41
NNW	8	11	1	0	0	0	20
Variable	0	0	0	0	0	0	0
Total	79	161	146	49	5	0	440

Hours of calm in this stability class: 10
 Hours of missing wind measurements in this stability class: 13
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

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Table D - 6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction Total	Wind Speed (in mph)						
	1-3	4-7	8-12	13-18	19-24	> 24	
N	14	17	9	15	0	0	41
NNE	10	18	9	4	0	0	41
NE	12	18	15	2	0	0	47
ENE	8	18	9	0	0	0	35
E	6	13	17	4	0	0	40
ESE	5	3	8	2	0	0	18
SE	8	5	6	0	0	0	19
SSE	4	14	6	0	0	0	24
S	1	18	40	3	0	0	62
SSW	2	11	19	2	0	0	34
SW	0	15	10	0	0	0	25
WSW	3	12	14	0	0	0	29
W	6	11	36	6	0	0	59
WNW	5	46	45	4	0	0	100
NW	8	30	22	0	0	0	60
NNW	5	16	4	0	0	0	25
Variable	0	0	0	0	0	0	0
Total	97	265	269	28	0	0	659

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 20
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-6, Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction Total	Wind Speed (in mph)						
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	5	3	0	0	0	10
NNE	0	2	0	0	0	0	2
NE	2	3	0	0	0	0	5
ENE	5	4	0	0	0	0	9
E	0	2	1	0	0	0	3
ESE	2	1	0	0	0	0	3
SE	3	1	0	0	0	0	4
SSE	2	2	2	0	0	0	6
S	1	3	5	0	0	0	9
SSW	4	2	4	1	0	0	11
SW	4	13	3	0	0	0	20
WSW	2	15	4	1	0	0	22
W	4	21	3	0	0	0	28
WNW	7	52	30	0	0	0	89
NW	11	29	3	0	0	0	43
NNW	10	13	4	0	0	0	27
Variable	0	0	0	0	0	0	0
Total	59	168	62	2	0	0	291

Hours of calm in this stability class: 1
 Hours of missing wind measurements in this stability class: 28
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D.-6 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, July - September, 2009

Limerick Tower 1

Period of Record: July - September 2009

Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	3	3	1	0	0	0	7
NNE	0	2	0	0	0	0	2
NE	2	3	1	0	0	0	6
ENE	1	3	0	0	0	0	4
E	4	0	0	0	0	0	4
ESE	3	0	2	0	0	0	5
SE	2	1	0	0	0	0	3
SSE	0	0	0	0	0	0	0
S	0	3	0	0	0	0	3
SSW	2	4	2	0	0	0	8
SW	3	4	2	0	0	0	9
WSW	3	8	1	0	0	0	12
W	6	14	1	0	0	0	21
WNW	10	24	11	0	0	0	45
NW	6	24	7	0	0	0	37
NNW	1	9	1	0	0	0	11
Variable	0	0	0	0	0	0	0
Total	46	102	29	0	0	0	177

Hours of calm in this stability class: 0
 Hours of missing wind measurements in this stability class: 18
 Hours of missing stability measurements in all stability classes: 14

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-7.0 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 30 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	2	2	0	0	0	0	4
NE	1	1	0	0	0	0	2
ENE	3	2	1	0	0	0	6
E	2	4	1	1	0	0	8
ESE	0	0	2	0	0	0	2
SE	2	1	0	0	0	0	3
SSE	1	1	0	0	0	0	2
S	0	6	0	0	0	0	6
SSW	1	8	1	0	0	0	10
SW	1	1	0	0	0	0	2
WSW	5	4	0	0	0	0	9
W	6	9	3	2	0	0	20
WNW	3	15	10	2	0	0	30
NW	2	4	10	3	0	0	19
NNW	1	1	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	31	59	28	8	0	0	126

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: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-7 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower #1								
Period of Record: October - December 2009								
Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)								
Winds Measured at 30 Feet								
Wind Speed (in mph)								
Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total	
N	0	0	1	1	0	0	2	
NNE	0	1	0	0	0	0	1	
NE	0	2	0	0	0	0	2	
ENE	1	0	0	0	0	0	1	
E	0	1	1	1	0	0	3	
ESE	0	0	0	0	0	0	0	
SE	0	0	0	0	0	0	0	
SSE	0	1	0	0	0	0	1	
S	0	3	0	0	0	0	3	
SSW	1	3	0	0	0	0	4	
SW	0	0	0	0	0	0	0	
WSW	0	0	0	0	0	0	0	
W	0	3	3	4	0	0	10	
WNW	0	6	11	7	0	0	24	
NW	2	3	5	2	3	0	15	
NNW	1	1	2	0	0	0	4	
Variable	0	0	0	0	0	0	0	
Total	5	24	23	15	3	0	70	

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: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-7: Wind Speed by Direction Measured at 30-Foot for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	2	3	10	1	0	0	7
NNE	1	1	0	0	0	0	2
NE	4	2	0	0	0	0	6
ENE	1	5	5	0	0	0	11
E	2	3	1	0	0	0	6
ESE	1	2	0	0	0	0	3
SE	0	0	0	0	0	0	0
SSE	1	0	0	0	0	0	1
S	1	2	2	0	0	0	5
SSW	0	2	0	0	0	0	2
SW	1	0	0	0	0	0	1
WSW	1	1	1	0	0	0	3
W	3	10	4	0	0	0	17
WNW	1	7	9	2	0	0	19
NW	1	3	10	9	1	0	24
NNW	0	4	1	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	20	45	34	12	1	0	112

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: 11

7346 1950 1951 1952 1953 1954 1955 1956 1957 1958 1959 1960 1961 1962 1963 1964 1965 1966 1967 1968 1969 1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017 2018 2019 2020 2021 2022 2023 2024 2025 2026 2027 2028 2029 2030 2031 2032 2033 2034 2035 2036 2037 2038 2039 2040 2041 2042 2043 2044 2045 2046 2047 2048 2049 2050 2051 2052 2053 2054 2055 2056 2057 2058 2059 2060 2061 2062 2063 2064 2065 2066 2067 2068 2069 2070 2071 2072 2073 2074 2075 2076 2077 2078 2079 2080 2081 2082 2083 2084 2085 2086 2087 2088 2089 2090 2091 2092 2093 2094 2095 2096 2097 2098 2099 2100 2101 2102 2103 2104 2105 2106 2107 2108 2109 2110 2111 2112 2113 2114 2115 2116 2117 2118 2119 2120 2121 2122 2123 2124 2125 2126 2127 2128 2129 2130 2131 2132 2133 2134 2135 2136 2137 2138 2139 2140 2141 2142 2143 2144 2145 2146 2147 2148 2149 2150 2151 2152 2153 2154 2155 2156 2157 2158 2159 2160 2161 2162 2163 2164 2165 2166 2167 2168 2169 2170 2171 2172 2173 2174 2175 2176 2177 2178 2179 2180 2181 2182 2183 2184 2185 2186 2187 2188 2189 2190 2191 2192 2193 2194 2195 2196 2197 2198 2199 2200 2201 2202 2203 2204 2205 2206 2207 2208 2209 2210 2211 2212 2213 2214 2215 2216 2217 2218 2219 2220 2221 2222 2223 2224 2225 2226 2227 2228 2229 2230 2231 2232 2233 2234 2235 2236 2237 2238 2239 2240 2241 2242 2243 2244 2245 2246 2247 2248 2249 2250 2251 2252 2253 2254 2255 2256 2257 2258 2259 2260 2261 2262 2263 2264 2265 2266 2267 2268 2269 2270 2271 2272 2273 2274 2275 2276 2277 2278 2279 2280 2281 2282 2283 2284 2285 2286 2287 2288 2289 2290 2291 2292 2293 2294 2295 2296 2297 2298 2299 2300 2301 2302 2303 2304 2305 2306 2307 2308 2309 2310 2311 2312 2313 2314 2315 2316 2317 2318 2319 2320 2321 2322 2323 2324 2325 2326 2327 2328 2329 2330 2331 2332 2333 2334 2335 2336 2337 2338 2339 2340 2341 2342 2343 2344 2345 2346 2347 2348 2349 2350 2351 2352 2353 2354 2355 2356 2357 2358 2359 2360 2361 2362 2363 2364 2365 2366 2367 2368 2369 2370 2371 2372 2373 2374 2375 2376 2377 2378 2379 2380 2381 2382 2383 2384 2385 2386 2387 2388 2389 2390 2391 2392 2393 2394 2395 2396 2397 2398 2399 2400 2401 2402 2403 2404 2405 2406 2407 2408 2409 2410 2411 2412 2413 2414 2415 2416 2417 2418 2419 2420 2421 2422 2423 2424 2425 2426 2427 2428 2429 2430 2431 2432 2433 2434 2435 2436 2437 2438 2439 2440 2441 2442 2443 2444 2445 2446 2447 2448 2449 2450 2451 2452 2453 2454 2455 2456 2457 2458 2459 2460 2461 2462 2463 2464 2465 2466 2467 2468 2469 2470 2471 2472 2473 2474 2475 2476 2477 2478 2479 2480 2481 2482 2483 2484 2485 2486 2487 2488 2489 2490 2491 2492 2493 2494 2495 2496 2497 2498 2499 2500 2501 2502 2503 2504 2505 2506 2507 2508 2509 2510 2511 2512 2513 2514 2515 2516 2517 2518 2519 2520 2521 2522 2523 2524 2525 2526 2527 2528 2529 2530 2531 2532 2533 2534 2535 2536 2537 2538 2539 2540 2541 2542 2543 2544 2545 2546 2547 2548 2549 2550 2551 2552 2553 2554 2555 2556 2557 2558 2559 2560 2561 2562 2563 2564 2565 2566 2567 2568 2569 2570 2571 2572 2573 2574 2575 2576 2577 2578 2579 2580 2581 2582 2583 2584 2585 2586 2587 2588 2589 2590 2591 2592 2593 2594 2595 2596 2597 2598 2599 2600 2601 2602 2603 2604 2605 2606 2607 2608 2609 2610 2611 2612 2613 2614 2615 2616 2617 2618 2619 2620 2621 2622 2623 2624 2625 2626 2627 2628 2629 2630 2631 2632 2633 2634 2635 2636 2637 2638 2639 2640 2641 2642 2643 2644 2645 2646 2647 2648 2649 2650 2651 2652 2653 2654 2655 2656 2657 2658 2659 2660 2661 2662 2663 2664 2665 2666 2667 2668 2669 2670 2671 2672 2673 2674 2675 2676 2677 2678 2679 2680 2681 2682 2683 2684 2685 2686 2687 2688 2689 2690 2691 2692 2693 2694 2695 2696 2697 2698 2699 2700 2701 2702 2703 2704 2705 2706 2707 2708 2709 2710 2711 2712 2713 2714 2715 2716 2717 2718 2719 2720 2721 2722 2723 2724 2725 2726 2727 2728 2729 2730 2731 2732 2733 2734 2735 2736 2737 2738 2739 2740 2741 2742 2743 2744 2745 2746 2747 2748 2749 2750 2751 2752 2753 2754 2755 2756 2757 2758 2759 2760 2761 2762 2763 2764 2765 2766 2767

Table D – 7 Wind Speed by Direction Measured at 50 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Neutral **171Ft-26Ft Delta-T (F)**

Winds Measured at 30 Feet

Wind Speed (in mph)

Wind Direction	Speed						Total
	1-3	4-7	8-12	13-18	19-24	25 > 24	
N	7	35	6	0	0	0	48
NNE	13	52	33	0	0	0	98
NE	12	39	29	2	0	0	82
ENE	18	46	17	1	0	0	82
E	6	16	33	3	0	0	58
ESE	9	4	2	0	0	0	15
SE	4	6	0	0	0	0	10
SSE	7	17	1	0	0	0	25
S	4	13	6	0	0	0	23
SSW	6	9	5	0	0	0	20
SW	4	7	0	0	0	0	11
WSW	10	3	4	0	0	0	17
W	16	28	23	5	0	0	72
WNW	16	39	48	21	0	0	124
NW	9	21	63	27	3	0	123
NNW	13	21	11	1	0	0	46
Variable	0	0	0	0	0	0	0
Total	154	356	281	60	3	0	854

Hours of calm in this stability class: 6
Hours of missing wind measurements in this stability class: 13
Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-7a: Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Slightly Stable - 171Ft-26Ft. Delta-T (F)

Winds Measured at 30 Feet

		Wind Speed (in mph)						
Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total	
N	13	14	0	0	0	0	27	
NNE	11	9	4	0	0	0	24	
NE	11	15	3	0	0	0	29	
ENE	15	15	5	0	0	0	35	
E	8	6	5	0	0	0	19	
ESE	8	6	5	1	0	0	20	
SE	5	8	2	0	0	0	15	
SSE	2	17	4	0	0	0	23	
S	4	18	1	0	0	0	23	
SSW	11	8	1	0	0	0	20	
SW	12	7	0	1	0	0	20	
WSW	22	10	2	0	0	0	34	
W	38	34	10	0	0	0	82	
WNW	21	61	21	0	0	0	103	
NW	16	22	15	0	0	0	53	
NNW	13	12	1	0	0	0	26	
Variable	2	0	0	0	0	0	2	
Total	212	262	79	2	0	0	555	

Hours of calm in this stability class: 18
 Hours of missing wind measurements in this stability class: 17
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 7. Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009
 Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 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	3	0	0	0	0	9
NE	6	1	0	0	0	0	7
ENE	4	4	0	0	0	0	8
E	4	4	0	0	0	0	8
ESE	3	0	0	0	0	0	3
SE	2	1	0	0	0	0	3
SSE	3	0	0	0	0	0	3
S	8	1	0	0	0	0	9
SSW	10	2	0	0	0	0	12
SW	6	1	0	0	0	0	7
WSW	17	0	0	0	0	0	17
W	35	2	0	0	0	0	37
WNW	23	12	0	0	0	0	35
NW	17	3	0	0	0	0	20
NNW	7	0	0	0	0	0	7
Variable	1	0	0	0	0	0	1
Total	160	34	0	0	0	0	194

Hours of calm in this stability class: 5
 Hours of missing wind measurements in this stability class: 4
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION -- UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D -- Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009
 Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 30 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	11	0	0	0	0	0	11
NNE	9	0	0	0	0	0	9
NE	8	0	0	0	0	0	8
ENE	2	0	0	0	0	0	2
E	3	1	0	0	0	0	4
ESE	2	0	0	0	0	0	2
SE	0	0	0	0	0	0	0
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	5	0	0	0	0	0	5
WSW	12	0	0	0	0	0	12
W	39	1	0	0	0	0	40
WNW	46	0	0	0	0	0	46
NW	21	1	0	0	0	0	22
NNW	17	0	0	0	0	0	17
Variable	2	0	0	0	0	0	2
Total	181	3	0	0	0	0	184

Hours of calm in this stability class: 31
 Hours of missing wind measurements in this stability class: 12
 Hours of missing stability measurements in all stability classes: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 8. Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Extremely Unstable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 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	1	2	0	0	0	0	3
NE	3	2	1	0	0	0	6
ENE	1	1	1	0	0	0	3
E	1	3	2	0	1	0	7
ESE	0	1	0	0	0	0	1
SE	2	0	0	2	0	0	4
SSE	0	3	0	0	0	0	3
S	0	3	4	0	0	0	7
SSW	0	2	7	1	0	0	10
SW	0	1	1	0	0	0	2
WSW	1	7	3	0	0	0	11
W	0	8	7	6	1	1	23
WNW	1	5	18	7	3	1	35
NW	1	0	6	3	0	1	11
NNW	0	0	1	2	0	0	3
Variable	0	0	0	0	0	0	0
Total	12	38	51	21	5	3	130

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: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009
 Stability Class - Moderately Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	1	1	0	0	3
NNE	1	1	0	0	0	0	2
NE	0	1	0	0	0	0	1
ENE	0	2	0	0	0	0	2
E	0	0	0	2	0	0	2
ESE	0	0	1	0	0	0	1
SE	0	0	0	0	0	0	0
SSE	0	0	0	0	0	0	0
S	0	1	3	0	0	0	4
SSW	1	0	3	0	0	0	4
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	0	0	2	1	7	2	12
WNW	0	4	5	9	4	2	24
NW	1	0	3	3	0	4	11
NNW	0	1	2	2	0	0	5
Variable	0	0	0	0	0	0	0
Total	3	11	20	18	11	8	71

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: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D.- 8: Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station; October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Slightly Unstable - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	3	2	1	0	0	6
NNE	0	3	1	0	1	0	5
NE	1	3	0	0	0	0	4
ENE	3	5	2	0	0	0	10
E	0	2	5	0	0	0	7
ESE	2	2	0	0	0	0	4
SE	0	1	0	0	0	0	1
SSE	1	1	0	0	0	0	2
S	0	1	4	1	0	0	6
SSW	1	0	1	0	0	0	2
SW	0	1	0	0	0	0	1
WSW	0	1	1	0	1	0	3
W	0	2	7	2	1	1	13
WNW	0	4	8	11	4	1	28
NW	0	0	3	6	2	2	13
NNW	1	1	3	1	2	0	8
Variable	0	0	0	0	0	0	0
Total	9	30	37	22	11	4	113

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: 11

SITE: LIMERICK GENERATING STATION -- UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-8.10 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October-December, 2009

Limerick Tower 1

Period of Record: October - December 2009
 Stability Class - Neutral - 171Ft-26Ft Delta-T (F)
 Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	14	23	7	0	0	49
NNE	5	25	39	14	0	0	83
NE	8	31	50	30	2	0	121
ENE	8	30	31	0	0	0	69
E	4	15	20	34	3	0	76
ESE	1	9	3	5	0	0	18
SE	6	5	2	2	0	0	15
SSE	1	7	14	0	0	0	22
S	0	4	15	10	1	0	30
SSW	1	6	10	5	3	0	25
SW	3	5	5	1	0	0	14
WSW	1	2	3	3	3	0	12
W	7	8	13	14	10	1	53
WNW	4	20	35	56	32	2	149
NW	3	10	22	50	13	5	103
NNW	4	6	14	8	2	0	34
Variable	0	0	0	0	0	0	0
Total	61	197	299	239	69	8	873

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: 21

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Slightly Stable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	>24	
N	4	10	15	3	0	0	32
NNE	9	12	15	3	0	0	39
NE	5	6	12	4	0	0	27
ENE	2	13	6	2	0	0	23
E	3	9	13	6	0	0	31
ESE	4	6	3	6	1	0	20
SE	2	4	4	4	0	0	14
SSE	2	6	8	6	0	0	22
S	1	8	16	11	0	0	36
SSW	2	9	7	3	0	0	21
SW	1	10	6	7	0	1	25
WSW	6	7	9	10	0	1	33
W	2	16	10	9	2	0	39
WNW	3	25	69	32	1	0	130
NW	4	11	41	15	0	0	71
NNW	3	6	7	1	0	0	17
Variable	0	0	0	0	0	0	0
Total	53	158	241	122	4	2	580

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: 11

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D - 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Moderately Stable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	0	1	1	0	0	0	2
NNE	1	4	3	0	0	0	8
NE	1	2	1	0	0	0	4
ENE	2	4	1	0	0	0	7
E	1	0	6	4	0	0	11
ESE	0	1	1	0	0	0	2
SE	4	0	0	0	0	0	4
SSE	1	0	0	0	0	0	1
S	1	3	3	0	0	0	7
SSW	0	5	5	1	0	0	11
SW	4	4	1	0	0	0	9
WSW	1	12	4	1	0	0	18
W	2	9	7	0	0	0	18
WNW	1	29	23	1	0	0	54
NW	6	10	8	2	0	0	26
NNW	7	7	3	0	0	0	17
Variable	0	0	0	0	0	0	0
Total	32	91	67	9	0	0	199

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: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 8 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, October - December, 2009

Limerick Tower 1

Period of Record: October - December 2009

Stability Class - Extremely Stable - 171Ft-26Ft Delta-T (F)

Winds Measured at 175 Feet

Wind Direction	Wind Speed (in mph)						Total
	1-3	4-7	8-12	13-18	19-24	> 24	
N	5	8	3	0	0	0	16
NNE	5	3	1	0	0	0	9
NE	5	2	0	0	0	0	7
ENE	4	2	0	0	0	0	6
E	4	4	1	0	0	0	9
ESE	3	2	1	0	0	0	6
SE	1	1	0	0	0	0	2
SSE	2	2	1	0	0	0	5
S	2	1	0	0	0	0	3
SSW	3	2	0	0	0	0	5
SW	4	6	2	0	0	0	12
WSW	7	9	3	0	0	0	19
W	5	13	3	0	0	0	21
WNW	10	15	25	0	0	0	50
NW	7	23	8	0	0	0	38
NNW	5	8	2	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	72	101	50	0	0	0	223

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: 11

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 9 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - December, 2009

Limerick Tower 1 30 ft. Wind Speed and Direction																	January-December, 2009 171Ft-26Ft Delta-T (F)									
Number of Observations = 8311 Values are Percent Occurrence																										
SPEED	WIND DIRECTION CLASSES																STABILITY CLASSES								TOTAL	
CLASS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL	
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.01								
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00							
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00						
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00					
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.13					0.13				
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23						0.23			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.25							0.25		
																									0.63	
EU	0.02	0.02	0.02	0.06	0.06	0.04	0.05	0.01	0.04	0.10	0.08	0.16	0.17	0.07	0.05	0.02	0.97	0.97								
MU	0.02	0.00	0.01	0.01	0.00	0.00	0.01	0.00	0.01	0.01	0.05	0.06	0.11	0.02	0.06	0.06	0.45		0.45							
1 SU	0.06	0.05	0.07	0.01	0.04	0.02	0.02	0.06	0.05	0.02	0.08	0.10	0.16	0.08	0.05	0.01	0.89			0.89						
- N	0.40	0.59	0.63	0.58	0.43	0.26	0.19	0.31	0.36	0.28	0.43	0.58	0.66	0.61	0.53	0.55	7.40				7.40					
3 SS	0.73	0.69	0.96	0.85	0.71	0.29	0.25	0.32	0.47	0.73	0.96	1.24	1.74	1.60	1.22	0.72	13.50					13.50				
MS	0.31	0.22	0.25	0.35	0.19	0.20	0.17	0.17	0.26	0.45	0.45	0.69	1.40	1.55	1.02	0.47	8.15						8.15			
ES	0.48	0.28	0.34	0.19	0.12	0.10	0.06	0.05	0.06	0.10	0.24	0.30	0.99	1.41	1.08	0.84	6.63							6.63		
																									37.99	
EU	0.13	0.24	0.29	0.22	0.08	0.02	0.04	0.04	0.31	0.57	0.43	0.34	0.75	0.61	0.30	0.07	4.44	4.44								
MU	0.04	0.07	0.12	0.07	0.04	0.02	0.01	0.05	0.10	0.26	0.08	0.06	0.14	0.42	0.30	0.10	1.89		1.89							
4 SU	0.23	0.14	0.13	0.14	0.10	0.05	0.04	0.10	0.19	0.32	0.20	0.23	0.28	0.24	0.39	0.08	2.86			2.86						
- N	1.07	1.22	1.25	1.65	1.34	0.34	0.32	0.73	0.77	0.88	0.41	0.37	0.78	1.49	1.78	0.84	15.24				15.24					
7 SS	0.47	0.48	0.66	0.84	0.77	0.45	0.53	0.83	1.20	0.73	0.31	0.41	1.23	1.93	1.06	0.77	12.67					12.67				
MS	0.04	0.06	0.04	0.06	0.07	0.04	0.02	0.06	0.17	0.14	0.04	0.00	0.11	0.29	0.13	0.01	1.28						1.28			
ES	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.06	0.02	0.00	0.13							0.13		
																									38.52	
EU	0.07	0.02	0.01	0.05	0.01	0.05	0.00	0.01	0.06	0.13	0.02	0.12	0.14	0.37	0.36	0.02	1.47	1.47								
MU	0.05	0.00	0.05	0.02	0.01	0.00	0.00	0.00	0.02	0.04	0.00	0.07	0.08	0.39	0.47	0.10	1.30		1.30							
8 SU	0.12	0.00	0.00	0.07	0.11	0.01	0.00	0.00	0.07	0.02	0.01	0.06	0.13	0.29	0.61	0.13	1.65			1.65						
- N	0.42	0.55	0.40	0.40	1.03	0.22	0.01	0.06	0.26	0.19	0.02	0.07	0.65	1.91	2.86	1.01	10.08				10.08					
1 SS	0.06	0.06	0.07	0.16	0.41	0.16	0.07	0.17	0.13	0.05	0.07	0.14	0.34	0.57	0.53	0.16	3.14					3.14				
2 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00		
																									17.64	
EU	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.11	0.05	0.00	0.20	0.20								
1 MU	0.01	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.06	0.12	0.22	0.00	0.45		0.45							
3 SU	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.12	0.39	0.05	0.60			0.60						
- N	0.02	0.02	0.02	0.01	0.08	0.04	0.00	0.00	0.04	0.00	0.00	0.00	0.25	0.72	1.31	0.20	2.73				2.73					
1 SS	0.00	0.00	0.00	0.00	0.07	0.01	0.00	0.00	0.00	0.00	0.01	0.00	0.04	0.10	0.02	0.04	0.29					0.29				
8 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00		
																									4.27	

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 9 Wind Speed by Direction Measured at 30 Feet for Various Stability Classes for the Limerick Generating Station, January - December, 2009

Limerick Tower 1 30 ft. Wind Speed and Direction																	January-December, 2009 171Ft-26Ft Delta-T (F)									
WIND DIRECTION CLASSES																	STABILITY CLASSES									
CLASS	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL	
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.01								
1 MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.07	0.00	0.08		0.08							
9 SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.04	0.01	0.00	0.07		0.07						
- N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.06	0.10	0.00	0.17			0.17					
2 SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00				
4 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00		
																									0.34	
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00								
G MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00							
T SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00						
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00					
2 SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00				
4 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.00		
																									0.00	
TOT	4.78	4.72	5.33	5.75	5.72	2.31	1.80	2.97	4.62	5.03	3.92	5.01	10.32	15.21	14.99	6.27	99.37	7.11	4.16	6.08	35.63	29.73	9.65	7.01	99.37	
Wind Direction by Stability																										
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-STABILITY CLASSES-								
	0.23	0.29	0.32	0.32	0.17	0.11	0.08	0.06	0.41	0.79	0.54	0.61	1.09	1.18	0.76	0.12	7.11	Extremely Unstable								
	0.12	0.07	0.18	0.11	0.06	0.02	0.02	0.05	0.16	0.31	0.13	0.19	0.40	0.96	1.12	0.25	4.16	Moderately Unstable								
	0.42	0.19	0.20	0.23	0.24	0.08	0.06	0.16	0.32	0.37	0.30	0.39	0.61	0.77	1.44	0.28	6.08	Slightly Unstable								
	1.91	2.38	2.30	2.64	2.89	0.85	0.53	1.11	1.43	1.35	0.87	1.02	2.36	4.80	6.58	2.61	35.63	Neutral								
	1.26	1.23	1.70	1.85	1.96	0.90	0.85	1.32	1.80	1.52	1.36	1.72	3.34	4.19	2.83	1.68	29.73	Slightly Stable								
	0.35	0.28	0.29	0.41	0.26	0.24	0.19	0.23	0.43	0.59	0.48	0.69	1.50	1.84	1.16	0.48	9.65	Moderately Stable								
	0.48	0.28	0.34	0.19	0.13	0.10	0.06	0.05	0.06	0.10	0.24	0.31	1.01	1.47	1.11	0.84	7.01	Extremely Stable								
Wind Direction by Wind Speed																										
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-WIND SPEED CLASSES-								
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.63	C A L M								
	2.03	1.84	2.29	2.06	1.55	0.91	0.76	0.93	1.25	1.68	2.30	3.12	5.22	5.35	4.01	2.68	37.99	< 3.5 mph								
	1.97	2.21	2.49	2.98	2.41	0.91	0.96	1.80	2.74	2.91	1.48	1.42	3.31	5.04	3.98	1.88	38.52	3.6 - 7.5 mph								
	0.72	0.64	0.53	0.70	1.58	0.43	0.08	0.24	0.55	0.43	0.13	0.47	1.35	3.53	4.84	1.42	17.64	7.6 - 12.5 mph								
	0.05	0.02	0.02	0.01	0.18	0.05	0.00	0.00	0.07	0.00	0.01	0.00	0.41	1.17	1.99	0.29	4.27	12.6 - 18.5 mph								
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.12	0.18	0.00	0.34	18.6 - 24.5 mph								
	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	> 24.5 mph								

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 10 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - December, 2009

Limerick Tower 1 175 ft. Wind Speed and Direction																	January-December, 2009 171Ft-26Ft Delta-T (F)									
Number of Observations = 8437 Values are Percent Occurrence																										
SPEED CLASS	WIND DIRECTION CLASSES																TOTAL	STABILITY CLASSES								TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		EU	MU	SU	N	SS	MS	ES		
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00		0.00							
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00			0.00						
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00				0.00					
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00				
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.01			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							0.04		
																									0.05	
EU	0.02	0.01	0.05	0.02	0.01	0.00	0.05	0.02	0.04	0.01	0.04	0.01	0.02	0.05	0.02	0.01	0.39	0.39								
MU	0.00	0.01	0.00	0.00	0.01	0.00	0.00	0.00	0.01	0.00	0.01	0.02	0.05	0.04	0.01	0.17	0.17	0.17								
1 SU	0.01	0.01	0.01	0.05	0.01	0.04	0.04	0.01	0.00	0.04	0.00	0.04	0.04	0.07	0.00	0.04	0.39		0.39							
- N	0.25	0.25	0.40	0.34	0.28	0.11	0.20	0.11	0.07	0.20	0.09	0.18	0.33	0.24	0.17	0.19	3.41				3.41					
3 SS	0.32	0.37	0.39	0.31	0.27	0.20	0.20	0.15	0.09	0.08	0.06	0.14	0.25	0.17	0.25	0.14	3.40					3.40				
MS	0.07	0.05	0.06	0.13	0.02	0.09	0.14	0.09	0.07	0.08	0.15	0.07	0.09	0.14	0.30	0.24	1.81						1.81			
ES	0.12	0.09	0.12	0.13	0.20	0.12	0.07	0.07	0.06	0.12	0.12	0.20	0.19	0.30	0.27	0.12	2.30							2.30		
																									11.88	
EU	0.06	0.14	0.25	0.12	0.08	0.02	0.01	0.07	0.08	0.18	0.15	0.25	0.34	0.25	0.05	0.02	2.09	2.09								
MU	0.05	0.08	0.06	0.09	0.02	0.00	0.01	0.00	0.06	0.13	0.05	0.05	0.17	0.20	0.09	0.08	1.16		1.16							
4 SU	0.12	0.20	0.09	0.12	0.07	0.04	0.05	0.06	0.17	0.12	0.12	0.12	0.13	0.13	0.11	0.05	1.68			1.68						
- N	0.56	0.73	1.08	1.10	0.81	0.39	0.20	0.32	0.38	0.41	0.46	0.26	0.51	0.79	0.52	0.46	9.00				9.00					
7 SS	0.43	0.52	0.57	0.89	0.58	0.40	0.20	0.40	0.58	0.62	0.59	0.58	0.72	1.47	0.77	0.55	9.97					9.97				
MS	0.12	0.09	0.11	0.12	0.11	0.07	0.08	0.13	0.23	0.27	0.45	0.52	0.58	1.26	0.69	0.37	5.19						5.19			
ES	0.18	0.07	0.08	0.13	0.06	0.07	0.06	0.06	0.13	0.28	0.27	0.34	0.51	0.85	0.72	0.26	4.09							4.09		
																									33.18	
EU	0.09	0.15	0.09	0.11	0.09	0.01	0.00	0.01	0.17	0.49	0.25	0.24	0.55	0.47	0.23	0.07	3.02	3.02								
MU	0.06	0.02	0.04	0.07	0.01	0.01	0.02	0.00	0.07	0.18	0.07	0.04	0.14	0.36	0.25	0.07	1.41		1.41							
8 SU	0.19	0.04	0.08	0.04	0.18	0.01	0.00	0.02	0.13	0.23	0.19	0.15	0.19	0.37	0.34	0.08	2.24			2.24						
- N	0.79	0.81	0.94	0.87	1.16	0.45	0.21	0.52	0.73	0.66	0.23	0.27	0.51	1.53	1.27	0.97	11.92				11.92					
1 SS	0.65	0.40	0.50	0.44	0.82	0.40	0.33	0.68	1.27	0.77	0.63	0.63	1.03	2.25	1.24	0.62	12.46					12.46				
2 MS	0.09	0.04	0.04	0.01	0.08	0.01	0.00	0.04	0.12	0.25	0.24	0.18	0.19	0.91	0.27	0.11	2.57						2.57			
ES	0.05	0.01	0.01	0.00	0.04	0.04	0.00	0.01	0.00	0.02	0.14	0.11	0.07	0.57	0.25	0.04	1.35							1.35		
																									34.98	
EU	0.01	0.00	0.00	0.00	0.00	0.00	0.06	0.00	0.02	0.12	0.06	0.18	0.26	0.24	0.08	0.02	1.05	1.05								
1 MU	0.05	0.00	0.00	0.00	0.02	0.00	0.00	0.00	0.02	0.02	0.00	0.06	0.14	0.31	0.18	0.06	0.87		0.87							
3 SU	0.06	0.00	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.05	0.01	0.08	0.12	0.43	0.21	0.09	1.11			1.11						
- N	0.43	0.31	0.41	0.02	0.71	0.28	0.04	0.05	0.23	0.31	0.09	0.14	0.58	2.04	1.55	0.59	7.79				7.79					
1 SS	0.09	0.08	0.07	0.04	0.25	0.26	0.11	0.14	0.37	0.24	0.18	0.21	0.37	0.77	0.27	0.14	3.59					3.59				
8 MS	0.00	0.01	0.00	0.00	0.05	0.01	0.00	0.01	0.00	0.07	0.01	0.04	0.02	0.02	0.02	0.00	0.27						0.27			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.00	0.00	0.04							0.04		
																									14.72	

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 10 Wind Speed by Direction Measured at 175 Feet for Various Stability Classes for the Limerick Generating Station, January - December, 2009.

Limerick Tower 1 175 ft.. Wind Speed and Direction																	January-December, 2009 171Ft-26Ft Delta-T (F)									
SPEED CLASS	WIND DIRECTION CLASSES																TOTAL	STABILITY CLASSES								TOTAL
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW		EU	MU	SU	N	SS	MS	ES		
EU	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.02	0.00	0.00	0.04	0.04	0.06	0.00	0.00	0.17	0.17								
1 MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.04	0.00	0.01	0.11	0.12	0.08	0.00	0.36									
9 SU	0.00	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.01	0.08	0.11	0.13	0.06	0.41		0.41							
- N	0.04	0.00	0.05	0.00	0.04	0.04	0.00	0.00	0.05	0.09	0.00	0.07	0.38	1.16	0.57	0.13	2.61			2.61						
2 SS	0.00	0.00	0.00	0.00	0.05	0.01	0.00	0.00	0.00	0.01	0.01	0.07	0.11	0.17	0.00	0.04	0.46				0.46					
4 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00					0.00				
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
																							4.01			
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.09	0.01	0.00	0.13	0.13								
G MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.06	0.06	0.00	0.17		0.17							
T SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.08	0.02	0.00	0.18			0.18						
N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.19	0.26	0.12	0.00	0.58				0.58					
2 SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.02	0.04	0.02	0.00	0.00	0.09					0.09				
4 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00						0.00			
																							1.15			
TOT	4.91	4.53	5.50	5.14	6.06	3.12	2.09	2.99	5.20	6.10	4.79	5.14	9.16	18.38	11.17	5.63	99.95	6.85	4.12	6.02	35.31	29.98	9.86	7.81	99.95	

Wind Direction by Stability

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-STABILITY CLASSES-
0.19	0.31	0.39	0.25	0.20	0.04	0.12	0.11	0.33	0.79	0.50	0.71	1.23	1.16	0.39	0.13	6.85	Extremely Unstable
0.15	0.12	0.09	0.17	0.07	0.01	0.04	0.00	0.15	0.38	0.12	0.18	0.63	1.09	0.70	0.23	4.12	Moderately Unstable
0.38	0.26	0.19	0.20	0.26	0.11	0.08	0.09	0.34	0.43	0.32	0.40	0.63	1.19	0.82	0.32	6.02	Slightly Unstable
2.06	2.10	2.88	2.33	3.00	1.27	0.65	1.00	1.46	1.68	0.88	0.94	2.50	6.02	4.20	2.35	35.31	Neutral
1.49	1.37	1.53	1.67	1.97	1.28	0.84	1.37	2.31	1.72	1.58	1.46	2.51	4.85	2.54	1.48	29.98	Slightly Stable
0.28	0.19	0.20	0.26	0.26	0.19	0.23	0.27	0.41	0.68	0.85	0.81	0.89	2.33	1.28	0.71	9.86	Moderately Stable
0.34	0.18	0.21	0.26	0.30	0.23	0.13	0.14	0.19	0.43	0.55	0.65	0.77	1.74	1.24	0.41	7.81	Extremely Stable

Wind Direction by Wind Speed

N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	-WIND SPEED CLASSES-
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	C A L M
0.79	0.79	1.03	0.98	0.82	0.56	0.70	0.46	0.33	0.55	0.46	0.65	0.95	1.01	1.04	0.75	11.88	< 3.5 mph
1.51	1.85	2.24	2.57	1.73	1.00	0.62	1.04	1.62	2.01	2.19	2.13	2.96	4.95	2.95	1.79	33.18	3.6 - 7.5 mph
1.93	1.47	1.69	1.53	2.38	0.94	0.57	1.28	2.49	2.60	1.74	1.41	2.68	6.46	3.85	1.96	34.98	7.6 - 12.5 mph
0.64	0.40	0.49	0.06	1.03	0.58	0.20	0.20	0.68	0.81	0.37	0.71	1.49	3.83	2.32	0.91	14.72	12.6 - 18.5 mph
0.04	0.01	0.05	0.00	0.09	0.05	0.00	0.00	0.08	0.14	0.01	0.20	0.71	1.61	0.78	0.23	4.01	18.6 - 24.5 mph
0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.04	0.37	0.52	0.21	0.00	1.15	> 24.5 mph

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 11 Annual x/Q and D/Q values for the North Stack, Limerick Generating Station, 2009

Limerick Generating Station x/Q and D/Q values					
North Stack - Flow = 251200 cfm				X/Q (s/m ³)	D/Q (1/m ²)
Stack ID	Location	Direction	Range (m)	Undepleted	
N	Site Boundary	S	762	1.86E-07	1.77E-09
N	Site Boundary	SSW	762	1.94E-07	1.75E-09
N	Site Boundary	SW	884	1.80E-07	1.51E-09
N	Site Boundary	WSW	854	2.12E-07	1.81E-09
N	Site Boundary	W	854	2.90E-07	2.95E-09
N	Site Boundary	WNW	793	1.03E-07	8.99E-10
N	Site Boundary	NW	762	7.11E-08	4.51E-10
N	Site Boundary	NNW	884	1.05E-07	7.59E-10
N	Site Boundary	N	884	1.76E-07	1.64E-09
N	Site Boundary	NNE	793	1.94E-07	2.00E-09
N	Site Boundary	NE	793	1.12E-07	1.12E-09
N	Site Boundary	ENE	793	1.36E-07	1.49E-09
N	Site Boundary	E	762	4.09E-07	4.48E-09
N	Site Boundary	ESE	762	8.02E-07	9.70E-09
N	Site Boundary	SE	762	9.04E-07	1.21E-08
N	Site Boundary	SSE	1006	1.91E-07	2.04E-09
N	RR-Inf-Lck-NG	S	300	7.98E-07	6.56E-09
N	RR-Inf-Lck-NG	SSW	225	1.40E-06	9.32E-09
N	RR-Inf-Lck-NG	SW	225	1.62E-06	9.92E-09
N	RR-Inf-Lck-NG	WSW	345	8.39E-07	6.13E-09
N	RR-Inf-Lck-NG	W	225	2.53E-06	2.09E-08
N	RR-Inf-Lck-NG	WNW	345	3.84E-07	3.10E-09
N	RR-Inf-Lck-NG	NW	450	1.62E-07	9.61E-10
N	RR-Inf-Lck-NG	ESE	884	6.55E-07	7.78E-09
N	RR-Inf-Lck-NG	WSW	450	5.27E-07	4.30E-09
N	RR-Inf-Lck-NG	NNE	682	2.37E-07	2.42E-09
N	Inhalation	N	948	1.61E-07	1.49E-09
N	Inhalation	NNE	825	1.84E-07	1.91E-09
N	Inhalation	NE	1057	7.87E-08	8.10E-10
N	Inhalation	ENE	985	1.03E-07	1.15E-09
N	Inhalation	E	873	3.42E-07	3.72E-09
N	Inhalation	ESE	1047	5.20E-07	6.08E-09
N	Inhalation	SE	1557	3.45E-07	4.23E-09
N	Inhalation	SSE	1647	1.03E-07	1.08E-09
N	Inhalation	S	1325	8.91E-08	9.09E-10
N	Inhalation	SSW	1543	7.90E-08	8.11E-10
N	Inhalation	SW	991	1.54E-07	1.31E-09

Table D - 11: Annual x/Q and D/Q values for the North Stack, Limerick Generating Station, 2009

Limerick Generating Station					X/Q and D/Q values	
North Stack - Flow = 251200 cfm					X/Q (s/m^3)	D/Q (1/m^2)
Stack ID	Location	Direction	Range (m)	Undepleted		
N 3	Inhalation	WSW	1158	1.42E-07		1.28E-09
N 7	Inhalation	W	1105	2.04E-07		2.06E-09
N 8	Inhalation	WNW	1198	5.88E-08		5.17E-10
N 9	Inhalation	NW	1104	4.34E-08		2.85E-10
N 10	Inhalation	NNW	1540	5.25E-08		4.10E-10
N 16	Vegetation	N	2867	5.74E-08		3.55E-10
N 17	Vegetation	NNE	2929	5.78E-08		3.82E-10
N 18	Vegetation	NE	3516	3.68E-08		1.03E-10
N 19	Vegetation	ENE	4372	4.70E-08		1.78E-10
N 20	Vegetation	E	3849	9.85E-08		4.72E-10
N 21	Vegetation	ESE	555	1.27E-06		1.55E-08
N 22	Vegetation	SE	390	2.43E-06		3.31E-08
N 23	Vegetation	SSE	2102	8.24E-08		7.71E-10
N 24	Vegetation	S	1860	6.34E-08		6.28E-10
N 25	Vegetation	SSW	1622	7.51E-08		7.65E-10
N 26	Vegetation	SW	1572	8.75E-08		8.33E-10
N 27	Vegetation	WSW	3662	6.52E-08		3.54E-10
N 28	Vegetation	W	1283	1.67E-07		1.70E-09
N 29	Vegetation	WNW	1198	5.88E-08		5.17E-10
N 30	Vegetation	NW	2490	2.20E-03		1.23E-10
N 31	Vegetation	NNW	2666	3.70E-08		2.09E-10
N 32	Meat	N	7565	3.33E-08		8.45E-11
N 33	Meat	ENE	6264	4.33E-08		1.04E-10
N 34	Meat	SE	3331	1.67E-07		1.36E-09
N 35	Meat	S	3722	4.84E-08		2.67E-10
N 36	Meat	SSW	3145	5.27E-08		3.52E-10
N 37	Meat	SW	5653	5.16E-08		1.68E-10
N 38	Meat	WSW	4336	6.13E-08		2.83E-10
N 39	Meat	W	4467	6.14E-08		3.15E-10
N 40	Cow	N	7565	3.33E-08		8.45E-11
N 41	Cow	S	6781	3.77E-08		1.11E-10
N 42	Cow	SSW	3145	5.27E-08		3.52E-10
N 43	Cow	WSW	4336	6.13E-08		2.83E-10
N 44	Cow	W	4467	6.14E-08		3.15E-10

SITE: LIMERICK GENERATING STATION - UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D-12 Annual x/Q and D/Q values for the Sout Stack, Limerick Generating Station, 2009

Limerick Generating Station x/Q and D/Q values				South Stack - Flow = 177200 cfm	
Stack ID	Location	Direction	Range (m)	X/Q (s/m^3) Undepleted	D/Q (1/m^2)
S	Site Boundary	S	762	6.22E-08	8.34E-10
S	Site Boundary	SSW	762	6.49E-08	8.61E-10
S	Site Boundary	SW	884	5.24E-08	7.29E-10
S	Site Boundary	WSW	854	6.89E-08	9.64E-10
S	Site Boundary	W	854	1.02E-07	1.23E-09
S	Site Boundary	WNW	793	3.36E-08	3.74E-10
S	Site Boundary	NW	762	2.28E-08	2.06E-10
S	Site Boundary	NNW	884	3.61E-08	3.98E-10
S	Site Boundary	N	884	6.76E-08	9.35E-10
S	Site Boundary	NNE	793	6.84E-08	1.25E-09
S	Site Boundary	NE	793	3.16E-08	7.37E-10
S	Site Boundary	ENE	793	3.94E-08	9.39E-10
S	Site Boundary	E	762	1.28E-07	2.35E-09
S	Site Boundary	ESE	762	2.65E-07	4.61E-09
S	Site Boundary	SE	762	3.39E-07	5.53E-09
S	Site Boundary	SSE	1006	6.70E-08	9.29E-10
S	RR-Inf-Lck-NG	S	300	2.55E-07	2.46E-09
S	RR-Inf-Lck-NG	SSW	225	4.39E-07	3.49E-09
S	RR-Inf-Lck-NG	SW	225	4.38E-07	3.34E-09
S	RR-Inf-Lck-NG	WSW	345	2.51E-07	2.49E-09
S	RR-Inf-Lck-NG	W	225	8.70E-07	7.37E-09
S	RR-Inf-Lck-NG	WNW	345	1.24E-07	1.16E-09
S	RR-Inf-Lck-NG	NW	450	5.15E-08	3.96E-10
S	RR-Inf-Lck-NG	ESE	884	2.24E-07	3.85E-09
S	RR-Inf-Lck-NG	WSW	450	1.59E-07	1.88E-09
S	RR-Inf-Lck-NG	NNE	682	8.09E-08	1.44E-09
S	Inhalation	N	948	6.24E-08	8.70E-10
S	Inhalation	NNE	825	6.55E-08	1.21E-09
S	Inhalation	NE	1057	2.59E-08	5.82E-10
S	Inhalation	ENE	985	3.29E-08	7.77E-10
S	Inhalation	E	873	1.11E-07	2.03E-09
S	Inhalation	ESE	1047	1.87E-07	3.16E-09
S	Inhalation	SE	1557	1.61E-07	2.56E-09
S	Inhalation	SSE	1647	4.46E-08	6.55E-10
S	Inhalation	S	1325	3.42E-08	5.73E-10
S	Inhalation	SSW	1543	3.24E-08	5.75E-10
S	Inhalation	SW	991	4.58E-08	6.74E-10
S	Inhalation	WSW	1158	4.93E-08	7.87E-10
S	Inhalation	W	1105	7.45E-08	9.60E-10
S	Inhalation	WNW	1198	2.03E-08	2.62E-10
S	Inhalation	NW	1104	1.44E-08	1.54E-10

SITE: LIMERICK GENERATING STATION – UNITS 1 & 2
 LICENSEE: EXELON GENERATION COMPANY, LLC

Table D – 12 Annual x/Q and D/Q values for the Sout Stack, Limerick Generating Station, 2009

Limerick Generating Station
 x/Q and D/Q values

South Stack – Flow = 177200 cfm				X/Q (s/m ³)	D/Q (1/m ²)
Stack ID	Location	Direction	Range (m)	Undepleted	
S	Inhalation	NNW	1540	2.09E-08	2.76E-10
S	Vegetation	N	2867	3.80E-08	2.82E-10
S	Vegetation	NNE	2929	3.89E-08	3.20E-10
S	Vegetation	NE	5416	3.12E-08	9.40E-11
S	Vegetation	ENE	4372	3.78E-08	1.58E-10
S	Vegetation	E	3849	7.31E-08	3.82E-10
S	Vegetation	ESE	555	3.96E-07	6.83E-09
S	Vegetation	SE	390	8.80E-07	1.38E-08
S	Vegetation	SSE	2102	4.29E-06	5.17E-10
S	Vegetation	S	1860	3.03E-06	4.61E-10
S	Vegetation	SSW	1622	3.18E-06	5.52E-10
S	Vegetation	SW	1572	3.19E-06	5.72E-10
S	Vegetation	WSW	3662	4.78E-08	3.09E-10
S	Vegetation	W	1283	6.38E-08	8.70E-10
S	Vegetation	WNW	1198	2.03E-08	2.62E-10
S	Vegetation	NW	2490	1.24E-08	9.37E-11
S	Vegetation	NNW	2666	2.25E-08	1.62E-10
S	Meat	N	7565	2.95E-08	7.46E-11
S	Meat	ENE	6264	3.76E-08	9.42E-11
S	Meat	SE	3331	1.20E-07	1.05E-09
S	Meat	S	3722	3.67E-08	2.32E-10
S	Meat	SSW	3145	3.62E-08	3.00E-10
S	Meat	SW	5653	4.34E-08	1.52E-10
S	Meat	WSW	4336	4.80E-08	2.52E-10
S	Meat	W	4467	4.81E-08	2.56E-10
S	Cow	N	7565	2.95E-08	7.46E-11
S	Cow	S	6781	3.32E-08	1.02E-10
S	Cow	SSW	3145	3.62E-08	3.00E-10
S	Cow	WSW	4336	4.80E-08	2.52E-10
S	Cow	W	4467	4.81E-08	2.56E-10

PROCESS CONTROL PROGRAM FOR RADIOACTIVE WASTES

1. PURPOSE

- 1.1. The purpose of the Process Control Program (PCP) is to:
 - 1.1.1. Establish the process and boundary conditions for the preparation of specific procedures for processing, sampling, analysis, packaging, storage, and shipment of solid radwaste in accordance with local, state, and federal requirements. **(CM-1)**
 - 1.1.2. Establish parameters which will provide reasonable assurance that all Low Level Radioactive Wastes (LLRW), processed by the in-plant waste process systems on-site OR by on-site vendor supplied waste processing systems, meet the acceptance criteria to a Licensed Burial Facility, as required by 10CFR Part 20, 10CFR Part 61, 10CFR Part 71, 49CFR Parts 171-172, "Technical Position on Waste Form (Revision 1)" [1/91], "Low-Level Waste Licensing Branch Technical Position on Radioactive Waste Classification" [5/83], and the Station Technical Specifications, as applicable.
 - 1.1.3. Provide reasonable assurance that waste placed in "on-site storage" meets the requirements as addressed within the Safety Analysis Reports for the low level radwaste storage facilities for dry and/or processed wet waste.

2. TERMS AND DEFINITIONS

- 2.1. **Process Control Program (PCP)**: The program which contains the current formulas, sampling, analysis, tests, and determinations to be made to ensure that processing and packaging of solid radioactive waste based on demonstrated processing of actual or simulated wet solid wastes will be accomplished in such a way as to assure the waste meets the stabilization criteria specified in 10CFR Parts 20, 61 and 71, state regulations, and burial site requirements.
- 2.2. **Solidification**: Liquid waste processed to either an unstable or stable form per 10CFR61 requirements. Waste solidified does not have to meet the 300-year free standing monolith criteria. Approved formulas, samples and tests do not have to meet NRC approval for wastes solidified in a container meeting stability (e.g. High Integrity Container).
- 2.3. **Stabilization**: Liquid waste processed to a "stable state" per 10CFR61 Requirements. Established formulas, samples, and tests shall be approved by the NRC in order to meet solidification "stabilization" criteria. This processing method is currently not available, because the NRC recognizes that waste packed in a High Integrity Container meets the 300-year stabilization criteria. In the event that this processing method becomes an acceptable method, then the NRC shall approve the stabilization formulas, samples, tests, etc.

- 2.4. **Solidification Media:** An approved media (e.g. Barnwell - vinyl ester styrene, cement, bitumen) when waste containing greater than 5-year half lives is solidified in a container when the activity is greater than 1 micro curie/cc. Waste solidified in a HIC is approved by the commission meeting the 10CFR61 stabilization criteria, including 1% free standing liquids by volume when the waste is packaged to a "stable" form and $\leq 0.5\%$ when waste is packaged to an "unstable" form. The formulas, sampling, analysis, and test do not require NRC approval, because the HIC meets the stability criteria.
- 2.4.1. Solidification to an unstable or stable state are performed by vendors, when applicable. Liquid waste solidified to meet stabilization criteria (10CFR61 and 01-91 Branch Technical Requirements) shall have documentation available that shows that the process is approved by the NRC or disposal facility.
- 2.5. **Dewatering:** The process of removing fluids from liquid waste streams to produce a waste form that meets the requirements of 10CFR Part 61 and applicable burial site criteria, $\leq 0.5\%$ by volume when the waste is packaged to an "unstable" state, or $\leq 1\%$ by volume when the waste is packaged to a "stable" form.
- 2.6. **High Integrity Container (HIC):** A disposable container that is approved to the Requirements of 10CFR61. The use of HIC's is an alternative to solidification or encapsulation in a steel container to meet burial stability. HIC's are used to package dewatered liquid wastes, (e.g. filter cartridges, filter media, resin, sludges, etc), or dry active waste.
- 2.7. **Encapsulation:** The process of placing a component (e.g. cartridge filters or mechanical components) into a special purpose disposable container and then completely surrounding the waste material with an approved stabilization media, such as cement.
- 2.8. **Liquid Waste Processing Systems:** In-plant or vendor supplied processing systems consisting of equipment utilized for evaporation, filtration, demineralization, dewatering, compression dewatering, solidification, or reverse osmosis (RO) for the treatment of liquid wastes (such as Floor Drains, Chemical Drains and Equipment Drain inputs).
- 2.9. **Incineration, RVR, and/or Glass Vitrification of Liquid or Solid:** Dry or wet waste processed via incineration and/or thermal processing where the volume is reduced by thermal means meets 10CFR61 requirements.
- 2.10. **Compaction:** When dry wastes such as paper, wood, plastic, cardboard, incinerator ash, and etc. are volume reduced through the use of a compactor.
- 2.11. **Waste Streams:** Consist of but are not limited to
- Filter media (powdered, bead resin and fiber),
 - Filter cartridges,
 - Pre-coat body feed material,
 - Contaminated charcoal,

- Fuel pool activated hardware,
- Oil Dry absorbent material added to a container to absorb liquids
- Fuel Pool Crud
- Sump and tank sludges,
- High activity filter cartridges,
- Concentrated liquids,
- Contaminated waste oil,
- Dried sewage or wastewater plant waste,
- Dry Active Waste (DAW): Waste such as filters, air filters, low activity cartridge filters, paper, wood, glass, plastic, cardboard, hoses, cloth, and metals, etc, which have become contaminated as a consequence of normal operating, housekeeping and maintenance activities.
- Other radioactive waste generated from cleanup of inadvertent contamination.

3. **RESPONSIBILITIES**

- 3.1. Implementation of this Process Control Program (PCP) is described in procedures at each station and is the responsibility of the each site to implement.

4. **MAIN BODY**

4.1. **Process Control Program Requirements**

- 4.1.1. A change to this PCP (Radioactive Waste Treatment Systems) may be made provided that the change is reported as part of the annual radioactive effluent release report, Regulatory Guide 1.21, and is approved by the Plant Operations Review Committee (PORC).
- 4.1.2. Changes become effective upon acceptance per station requirements.
- 4.1.3. A solidification media, approved by the burial site, may be **REQUIRED** when liquid radwaste is solidified to a stable/unstable state.
- 4.1.4. **When** processing liquid radwaste to meet solidification stability using a vendor supplied solidification system:
1. **If** the vendor has its own Quality Assurance (QA) Program, **then** the vendor shall **ADHERE** to its own QA Program and shall have **SUBMITTED** its process system topical report to the NRC or agreement state.
 2. **If** the vendor does **not HAVE** its own Quality Assurance Program, **then** the vendor shall **ADHERE** to an approved Quality Assurance Topical Report standard belonging to the Station or to another vendor.

4.1.5. The vendor processing system(s) is/are controlled per the following:

1. A commercial vendor supplied processing system(s) may be **USED** for the processing of LLRW streams.
2. Vendors that process liquid LLRW at the sites shall **MEET** applicable QA Topical Report and Augmented Quality Requirements.

4.1.6. Vendor processing system(s) operated at the site shall be **OPERATED and CONTROLLED** in accordance with vendor approved procedures or station procedures based upon vendor approved documents.

4.1.7. All waste streams processed for burial or long term on-site storage shall **MEET** the waste classification and characteristics specified in 10CFR Part 61.55, Part 61.56, the 5-83 Branch Technical Position for waste classification, and the applicable burial site acceptance criteria (for any burial site operating at the time the waste was processed).

4.2. General Waste Processing Requirements

NOTE: On-site resin processing involves tank mixing and settling, transferring to the station or vendor processing system via resin water slurry or vacuuming into approved waste containers, and, when applicable, dewatering for burial.

4.2.1. Vendor resin beds may be **USED** for decontamination of plant systems, such as, Spent Fuel Pool, RWCU (reactor water cleanup), and SDC (Shut Down Cooling). These resins are **then PROCESSED** via the station or vendor processing system.

4.2.2. Various drains and sump discharges will be **COLLECTED** in tanks or suitable containers for processing treatment. Water from these tanks may be **SENT** through a filter, demineralizer, concentrator or vendor supplied processing systems.

4.2.3. Process waste (e.g. filter media, sludges, resin, etc) will be periodically **DISCHARGED** to the station or vendor processing system for onsite waste treatment **or PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.

4.2.4. Process water (e.g. chemical, floor, equipment drain, etc.) may be **SENT** to either the site waste process systems or vendor waste processing systems for further filtration, demineralization for plant re-use, or discharge.

4.2.5. All dewatering and solidification/stabilization will be **PERFORMED** by either utility site personnel or by on-site vendors **or** will be **PACKAGED and SHIPPED** to an off-site vendor low-level radwaste processing facility.

- 4.2.6. Dry Active Waste (DAW) will be **HANDLED** and **PROCESSED** per the following:
1. DAW will be **COLLECTED** and **SURVEYED** and may be **SORTED** for compactable and non-compactable wastes.
 2. "DAW may be packaged in containers to facilitate on-site pre-compaction and/or off-site vendor contract requirements
 3. DAW items may be **SURVEYED** for release onsite or offsite when applicable.
 4. Contaminated filter cartridges will be **PLACED** into a HIC or will be **ENCAPSULATED** in an in-situ liner for disposal or **SHIPPED** to an offsite waste processor in drums, boxes or steel liners per the vendor site criteria for processing and disposal.
- 4.2.7. Filtering devices using pre-coat media may be **USED** for the removal of suspended solids from liquid waste streams. The pre-coat material or cartridges from these devices may be routinely **REMOVED** from the filter vessel and discharged to a Filter Sludge Tank or Liner/HIC. Periodically, the filter sludge may be **DISCHARGED** to the vendor processing system for waste treatment onsite or **PACKAGED** in containers for shipment to offsite vendor for volume reduction processing.
- 4.2.8. Activated hardware stored in the Spent Fuel Pools will be **PROCESSED** periodically using remote handling equipment and may then be **PUT** into a container for shipment or storage
- 4.2.9. High Integrity Containers (HIC):
1. For Barnwell disposal vendors who supply HIC's to the station shall **PROVIDE** a copy of the HIC Certificate of Compliance, which details specific limitations on use of the HIC.
 2. For Disposal at Clive vendors who supply HIC's to the station shall **PROVIDE** a copy of the HIC Certificate of Conformance, which details specific limitations on use of the HIC.
 3. Vendors who supply HIC's to the station shall **PROVIDE** a handling procedure, which establishes guidelines for the utilization of the HIC. These guidelines serve to protect the integrity of the HIC and ensure the HIC is handled in accordance with the requirements of the Certificate of Compliance or Certificate of Conformance.
- 4.2.10. Lubricants and oils contaminated as a consequence of normal operating and maintenance activities may be **PROCESSED** on-site (by incineration, for oils meeting 10CFR20.2004 and applicable state requirements, or by an approved vendor process) or **SHIPPED** offsite (for incineration or other acceptable processing method).
- 4.2.11. Former in-plant systems GE or Stock Drum Transfer Cart and Drum Storage Areas may be **USED** for higher dose DAW storage at Clinton, Dresden, Quad Cities, Braidwood and Byron.

- 4.2.13 Certain waste, including flowable solids from holding pond, oily waste separator, cooling tower basin and emergency spray pond, may be disposed of onsite under the provisions of 10CFR20.2002 permit. Specific requirements associated with the disposal shall be incorporated into station implementing procedures. **(CM-2)**

4.3. Burial Site Requirements

- 4.3.1. Waste sent directly to burial shall **COMPLY** with the applicable parts of 49CFR171-172, 10CFR61, 10CFR71, and the acceptance criteria for the applicable burial site.

4.4. Shipping and Inspection Requirements

- 4.4.1. All shipping/storage containers shall be **INSPECTED**, as required by station procedures, for compliance with applicable requirements (Department Of Transportation (DOT), Nuclear Regulatory Commission (NRC), station, on-site storage, and/or burial site requirements) prior to use.
- 4.4.2. Containers of solidified liquid waste shall be **INSPECTED** for solidification quality and/or dewatering requirements per the burial site, offsite vendor acceptance, or station acceptance criteria, as applicable.
- 4.4.3. Shipments sent to an off site processor shall be **INSPECTED** to ensure that the applicable processor's waste acceptance criteria are being met.

4.5. Inspection and Corrective Action

- 4.5.1. Inspection results that indicate non-compliance with applicable NRC, State, vendor, or site requirements shall be **IDENTIFIED and TRACKED** through the Corrective Action Program.
- 4.5.2. Administrative controls for preventing unsatisfactory waste forms from being released for shipment are described in applicable station procedures. If the provisions of the Process Control Program are not satisfied, then **SUSPEND** shipments of defectively packaged radioactive waste from the site. **(CM-1)**
- 4.5.3. If freestanding water or solidification not meeting program requirements is observed, then samples of the particular series of batches shall be **TAKEN** to determine the cause. Additional samples shall be **TAKEN**, as warranted, to ensure that no freestanding water is present and solidification requirements are maintained.

4.6. Procedure and Process Reviews

- 4.6.1. The Exelon Nuclear Process Control Program and changes to it (other than editorial/minor changes) shall be **REVIEWED and APPROVED** in accordance with the station procedures, plant-specific Technical Specifications (Tech Spec), Technical Requirements Manual (T&RM), Operation Requirements Manual (ORM), as applicable, for the respective station and LS-AA-106. Changes to the Licensees Controlled Documents, UFSAR, ORM, or TRM are controlled by the provisions of 10CFR 50.59.

4.6.2. Any changes to the PCP shall be reviewed to determine if reportability is required in the Annual Radiological Effluent Release Report (ARERR). The Radwaste Specialist shall ensure correct information is **SUBMITTED** to the ODCM program owner prior to submittal of the ARERR.

4.6.3. Station processes, cask manual procedures as applicable to your station, or other vendor waste processing/operating procedures shall be approved per RM-AA-102-1006. Procedures related to waste manifests, shipment inspections, and container activity determination are **CONTROLLED** by Radiation Protection Standard Procedures (RP-AA-600 Series).

1. Site waste processing **IS CONTROLLED** by site operating procedures.
2. Liquid processed by vendor equipment shall be **DONE** in accordance with vendor procedures.

4.7. Waste Types, Point of Generation, and Processing Method

Methods of processing and individual vendors may **CHANGE** due to changing financial and regulatory options. The table below is a representative sample. It is **not** intended be all encompassing.

WASTE STREAM	POINTS OF GENERATION	AVAILABLE WASTE PROCESSING METHODS
Bead Resin	Systems - Fuel Pool, Condensate, Reactor Water Cleanup, Blowdown, Equipment Drain, Chemical and Volume Control Systems, Floor Drain, Maximum Recycle, Blowdown, Boric Acid Recycling System, Vendor Supplied Processing Systems, and Portable Demin System	Dewatering, solidification to an unstable/stable state Thermal Processing Free Release to a Land Fill
Powdered Resin	Systems - (Condensate System, Floor Drain/Equipment Drain filtration, Fuel Pool)	Dewatering, solidification to an unstable/stable state Thermal Processing
Concentrated Waste	Waste generated from Site Evaporators resulting typically from the Floor Drain and Equipment Drain Systems	Solidification to an unstable/stable state Thermal Processing
Sludge	Sedimentation resulting from various sumps, condensers, tanks, cooling tower, emergency spray pond, holding pond, and oily waste separators..	Dewatering, solidification to an unstable/stable state Thermal Processing Evaporation on-site or at an offsite processor On-site disposal per 10CFR20.2002 permit

WASTE STREAM	POINTS OF GENERATION	AVAILABLE WASTE PROCESSING METHODS
Filter cartridges	Systems - Floor/Equipment Drains, Fuel Pool; cartridge filters are typically generated from clean up activities within the fuel pool, torus, etc.	Dewatering, solidification to an unstable/stable state Processed by a vendor for volume reduction
Dry Active Waste	Paper, wood, plastic, rubber, glass, metal, and etc. resulting from daily plant activities.	Decon/Sorting for Free Release, Compaction/Super-compaction Thermal Processing by Incineration or glass vitrification Sorting for Free Release Metal melting to an ingot
Contaminated Oil	Oil contaminated with radioactive materials from any in-plant system.	Solidification unstable state Thermal Processing by Incineration Free Release for recycling
Drying Bed Sludge	Sewage Treatment and Waste Water Treatment Facilities	Free release to a landfill or burial
Metals	See DAW	See DAW
Irradiated Hardware	Fuel Pool, Reactor Components	Volume Reduction for packaging efficiencies

5. **DOCUMENTATION**

5.1.1. Records of reviews performed shall be retained for the duration of the unit operating license. This documentation shall contain:

1. Sufficient information to support the change together with the appropriate analyses or evaluations justifying the change, and
2. A determination which documents that the change will maintain the overall conformance of waste products to Federal (10CFR61 and the Branch Technical Position), State, or other applicable requirements, including applicable burial site criteria.

6. **REFERENCES**

6.1. **Technical Specifications:**

6.1.1. The details contained in Current Tech Specs (CTS) or Improved Technical Specifications (ITS), as applicable, in regard to the Process Control Program (PCP), are to be relocated to the Licensee Controlled Documents. Some facilities have elected to relocate these details into the Operational Requirements Manual (ORM). Relocation of the description of the PCP from the CTS or ITS does **not** affect the safe operation of the facility. Therefore, the relocation details are **not** required to be in the CTS or the ITS to provide adequate protection of the public health and safety.

6.2. Writers' References:

- 6.2.1. Code Of Federal Regulations: 10 CFR Part 20, Part 61, Part 71, 49 CFR Parts 171-172
- 6.2.2. Low Level Waste Licensing Branch Technical Position On Radioactive Waste Classification, May 1983
- 6.2.3. Technical Position on Waste Form (Revision 1), January 1991
- 6.2.4. Branch Technical Position on Concentration Averaging and Encapsulation, January 1995
- 6.2.5. Regulatory Guide 1.21
- 6.2.6. I.E. Circular 80.18, 10CFR 50.59 Safety Evaluation for Changes to Radioactive Waste Treatment Systems

6.3. User References

- 6.3.1. Quality Assurance Program
- 6.3.2. LS-AA-106
- 6.3.3. RM-AA-102-1006
- 6.3.4. RP-AA-600 Series
- 6.3.5. CY-AA-170-2000, Annual Radioactive Effluent Release Report

6.4. Station Commitments:

- 6.4.1. Peach Bottom
CM-1, T03819, Letter from G.A. Hunger, Jr., dated Sept. 29,94, transmitting TSCR 93-16 (Improved Technical Specifications).
- 6.4.2. Limerick
CM-2, T03896, 10CFR20.2002 permit granted to Limerick via letter dated July 10, 1996.

7. **ATTACHMENTS** - None