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Nuclear

SVP-10-020

10 CFR 50.36a

April 28, 2010

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, D.C. 20555

Quad Cities Nuclear Power Station, Units 1 and 2
Renewed Facility Operating License Nos. DPR-29 and DPR-30
NRC Docket Nos. 50-254 and 50-265

Subject: Radioactive Effluent Release Report for 2009

Reference: Letter from Timothy J. Tulon (Exelon Generation Company, LLC) to U. S. NRC, "Quad Cities Nuclear Power Station Radioactive Effluent Report for January through December 2007," dated April 25, 2008

Pursuant to Technical Specifications Section 5.6.3 and 10 CFR 50.36a, enclosed is the Quad Cities Nuclear Power Station Radioactive Effluent Release Report for January through December 2009. There was one abnormal release that occurred during 2009. This release resulted in a minor contribution to normal plant radioactive effluents and is discussed in detail in the report.

Additionally, the following documents were revised in 2009 and as a result are included with this submittal:

- Process Control Program for Radioactive Wastes (RW-AA-100, Revision 7) pursuant to Section 12.7.3.4 of the Off-Site Dose Calculation Manual (ODCM); and
- ODCM (CY-QC-170-301, Revision 9) pursuant to Technical Specifications Section 5.5.1.c.3 and Section 12.7.4.3.3 of the ODCM.

The final enclosure (Attachment 4) is a correction to the Radioactive Effluent Release Report for 2007 which was submitted by the referenced letter.

1E48
NRR

Should you have any questions concerning this letter, please contact Mr. Wally J. Beck at (309) 227-2800.

Respectfully,

Timothy J. Tulon
Site Vice President
Quad Cities Nuclear Power Station

Attachments:

1. 2009 Annual Radioactive Effluent Release Report
2. RW-AA-100, Revision 7, Process Control Program for Radioactive Wastes
3. CY-QC-170-301, Revision 9, Off-Site Dose Calculation Manual
4. Errata/Correction to the 2007 Annual Radioactive Effluent Release Report

cc: Regional Administrator – NRC Region III
NRC Senior Resident Inspector – Quad Cities Nuclear Power Station

Attachment 1

2009 Annual Radioactive Effluent Release Report

Quad Cities Nuclear Power Station
2009 Annual Radioactive Effluent Release Report

Effluent & Waste Disposable Summary

Gaseous Effluents – Summation of all Releases

Period: January – December 2009 Unit: 1 & 2

A. Fission & Activation Gases	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	Est. Total Error %
1. Total Release	Ci	4.60E+01	2.61E+01	4.09E+01	5.86E+01	1.72E+02	13.0
2. Average release rate for the period	µCi/sec	5.92E+00	3.32E+00	5.14E+00	7.37E+00		
3. Percent of ODCM limit[1]	%γ	4.55E-03	2.57E-03	3.94E-03	5.75E-03		
	%β	1.17E-03	6.59E-04	1.02E-03	1.48E-03		

B. Iodine							
1. Total Iodine – 131	Ci	6.09E-04	9.12E-04	8.17E-04	9.96E-04	3.33E-03	41.8
2. Average release rate for the period	µCi/sec	7.83E-05	1.16E-04	1.03E-04	1.25E-04		
3. Percent of ODCM limit	%	N/A	N/A	N/A	N/A		

C. Particulates							
1. Total particulates	Ci	2.76E-04	4.06E-04	2.07E-04	2.48E-04	1.14E-03	32.3
2. Average release rate for the period	µCi/sec	3.55E-05	5.16E-05	2.61E-05	3.12E-05		
3. Percent of ODCM limit	%	N/A	N/A	N/A	N/A		
4. Gross alpha radioactivity	Ci	<LLD[2]	<LLD[2]	<LLD[2]	<LLD[2]		

D. Tritium							
1. Total Release[3]	Ci	4.67E+01	2.35E+01	2.36E+01	2.69E+01	1.21E+02	6.3
2. Average release rate for the period	µCi/sec	6.01E+00	2.99E+00	2.97E+00	3.38E+00		
3. Percent of ODCM limit	%	N/A	N/A	N/A	N/A		

E. Iodine 131 & 133, Tritium & Particulate					
1. Percent of ODCM limit	%	7.01E-01	1.09E+00	9.65E-01	1.16E+00

(1) % Noble gas gamma/noble gas beta dose limits
(2) Gross alpha LLD reported on page 6 of 71
(3) Anamolous January 2009 gaseous H-3 result of 26.1 Ci (IR 879281).

Quad Cities Nuclear Power Station
2009 Annual Radioactive Effluent Release Report

Effluent & Waste Disposable Summary

Gaseous Effluents Release Point Main Chimney (Elevated)

Period: January – December 2009 Unit: 1 & 2

Nuclides Released		Continuous Mode					Batch Mode				
1. Fission gases	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Kr-85	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Kr-85m	Ci	2.34E-01	1.44E-01	2.98E-01	3.05E-01	9.81E-01	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Kr-87	Ci	1.43E+00	7.87E-01	1.22E+00	1.86E+00	5.30E+00	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Kr-88	Ci	8.76E-01	4.86E-01	7.78E-01	1.20E+00	3.34E+00	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-131M	Ci	<LLD(1)	<LLD(1)	<LLD(1)	5.77E-02	5.77E-02	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-133	Ci	3.16E-01	2.76E-01	1.36E+00	6.60E-01	2.61E+00	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-135	Ci	1.14E+00	6.37E-01	9.43E-01	1.47+00	2.72E+00	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-135m	Ci	8.46E+00	4.74E+00	7.16E+00	1.07E+01	3.11E+01	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-138	Ci	3.35E+01	1.88E+01	2.86E+01	4.21E+01	1.23E+02	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ar-41	Ci	9.69E-02	1.82E-01	4.93E-01	2.20E-01	9.92E-01	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Total for Period	Ci	4.61E+01	2.61E+01	4.09E+01	5.86E+01	1.72E+02	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
2. Iodines											
I-131	Ci	6.09E-04	8.68E-04	7.96E-04	9.96E-04	3.27E-03	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
I-133	Ci	2.00E-03	1.49E-03	2.85E-03	4.61E-03	1.10E-02	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
I-135	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Total for Period	Ci	2.61E-03	2.36E-03	3.65E-03	5.61E-03	1.42E-02	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
3. Particulates											
Sr-89	Ci	6.14E-05	<LLD(1)	7.12E-05	5.43E-05	1.87E-04	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Sr-90	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Cs-134	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Cs-137	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ba-140	Ci	8.11E-05	<LLD(1)	<LLD(1)	<LLD(1)	8.11E-05	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
La-140	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Cr-51	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Mn-54	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Co-58	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Co-60	Ci	<LLD(1)	2.20E-05	3.54E-05	7.26E-05	1.30E-04	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Mo-99	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ag-110m	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ce-141	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ce-144	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Total for Period	Ci	1.42E-04	2.20E-05	1.07E-04	1.27E-04	3.98E-04	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)

(1) Gaseous LLD's reported on page 6 of 71

(2) No gaseous batch releases

Effluent & Waste Disposable Summary

Gaseous Effluents Release Point Reactor Vents (Mixed Mode)

Period: January – December 2009 Unit: 1 & 2

Nuclides Released		Continuous Mode					Batch Mode				
1. Fission gases	**Unit**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Total**	**Quarter 1**	**Quarter 2**	**Quarter 3**	**Quarter 4**	**Total**
Kr-85	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Kr-85m	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Kr-87	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Kr-88	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-133	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-133M	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-135	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-135m	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Xe-138	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ar-41	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Total for Period	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
2. Iodines											
I-131	Ci	<LLD(1)	4.41E-05	2.12E-05	<LLD(1)	6.53E-05	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
I-133	Ci	<LLD(1)	1.04E-04	<LLD(1)	<LLD(1)	1.04E-04	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
I-135	Ci	<LLD(1)	<LLD(1)	<LLD(1)	1.17E-03	1.17E-03	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Total for Period	Ci	<LLD(1)	1.48E-04	2.12E-05	1.17E-03	1.34E-03	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
3. Particulates											
Sr-89	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Sr-90	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Cs-134	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Cs-137	Ci	2.76E-06	5.75E-06	<LLD(1)	<LLD(1)	8.51E-06	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ba-140	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
La-140	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Cr-51	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Mn-54	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Co-58	Ci	1.49E-05	<LLD(1)	<LLD(1)	<LLD(1)	1.49E-05	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Co-60	Ci	1.16E-04	3.78E-04	1.01E-04	1.21E-04	7.16E-04	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Mo-99	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ag-110m	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ce-141	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Ce-144	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Zn-65	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)
Total for Period	Ci	1.34E-04	3.84E-04	1.01E-04	1.21E-04	7.40E-04	N/A(2)	N/A(2)	N/A(2)	N/A(2)	N/A(2)

(1) Gaseous LLD's reported on page 6 of 71

(2) No gaseous batch releases

Quad Cities Nuclear Power Station
2009 Annual Radioactive Effluent Release Report

Effluent & Waste Disposal Summary

Liquid Effluents – Summation of all Releases

Period: January – December 2009 Unit: 1 & 2

A. Fission & Activation Products	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	Est. Total Error %
1. Total Release (not including tritium, gases & alpha)	Ci	9.18E-05	7.50E-03	<LLD[2]	7.66E-04	8.36E-03	5.4
2 Average diluted concentration during period	µCi/mL	3.28E-13	2.04E-11	N/A	2.35E-12		
3. Percent of applicable limit[1]	WB	2.90E-02	3.43E-01	N/A	3.43E-02		
	O	1.38E-02	1.53E-01	N/A	1.63E-02		
4. Maximum diluted concentration during batch discharges	µCi/mL	1.17E-10	2.61E-09	N/A	6.28E-10		
B. Tritium							
1. Total Release	Ci	7.75E-01	7.41E+00	<LLD[2]	4.05E+00	1.22E-01	4.1
2. Average diluted concentration during period	µCi/mL	2.76E-09	2.01E-08	N/A	1.24E-08		
3. Percent of applicable limit	%	3.29E-02	5.07E-02	N/A	4.33E-02		
C. Dissolved & Entrained Gases							
1. Total Release	Ci	<LLD[2]	1.50E-04	<LLD[2]	3.71E-04	5.21E-04	5.4
2. Average diluted concentration during period	µCi/mL	N/A	4.08E-13	N/A	1.14E-12		
3. Percent of applicable limit	%	N/A	1.95E-05	N/A	5.96E-05		
D. Gross Alpha Activity							
1. Total Release	Ci	<LLD[2]	<LLD[2]	<LLD[2]	<LLD[2]	<LLD[2]	14.8
E. Volume Of Waste Released (prior to dilution)	Liters	2.14E+05	1.05E+06	0.00E+00	6.42E+05	1.91E+06	
F. Volume Of Dilution Water Used During Period	Liters	2.80E+11	3.68E+11	4.92E+11	3.26E+11	1.47E+12	

(1) Whole body/organ (ODCM)

(2) Liquid LLD's reported on page 7 of 71

Effluent & Waste Disposal Summary

Liquid Effluents Release Point Mississippi River

Period: January – December 2009 Unit: 1 & 2

Nuclides Released		Continuous Mode					Batch Mode				
	Unit	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total	Quarter 1	Quarter 2	Quarter 3	Quarter 4	Total
Sr-89	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Sr-90	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Cs-134	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Cs-137	Ci	<LLD(1)	6.37E-08	<LLD(1)	<LLD(1)	6.37E-08	5.50E-05	8.36E-04	<LLD(1)	2.24E-04	1.12E-03
I-131	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Co-58	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	2.38E-05	<LLD(1)	<LLD(1)	2.38E-05
Co-60	Ci	<LLD(1)	9.04E-08	<LLD(1)	<LLD(1)	9.04E-08	3.68E-05	1.16E-03	<LLD(1)	5.09E-04	1.71E-03
Fe-55	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	5.47E-03	<LLD(1)	<LLD(1)	5.47E-03
Fe-59	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Zn-65	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Mn-54	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	3.32E-05	3.32E-05
Cr-51	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Zr-95	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Nb-95	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Mo-99	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Tc-99m	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Ba-140	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
La-140	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Ce-141	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Ag-110m	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Sb-124	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)
Total for Period	Ci	<LLD(1)	1.54E-07	<LLD(1)	<LLD(1)	<LLD(1)	9.18E-05	7.49E-03	<LLD(1)	7.66E-04	8.35E-03
Xe-133	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	1.50E-04	<LLD(1)	3.71E-04	5.21E-04
Xe-135	Ci	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)	<LLD(1)

(1) Liquid LLD's reported on page 7 of 71
(2) No batch releases

Effluent & Waste Disposable Summary

GASEOUS EFFLUENT LLD's (Most Restrictive)
CONTINUOUS MODE

NUCLIDE LOWER LIMITS OF DETECTION (LLD's) **1. Fission gases**	**UNIT**	**LLD Value**	**ODCM Required LLD**
Kr-85	uCi/cc	3.15E-06	None
Kr-85m	uCi/cc	1.57E-08	None
Kr-87	uCi/cc	5.68E-08	1E-04
Kr-88	uCi/cc	4.81E-08	1E-04
Xe-133	uCi/cc	2.94E-08	1E-04
Xe-133m	uCi/cc	8.67E-08	1E-04
Xe-135	uCi/cc	9.39E-08	1E-04
Xe-135m	uCi/cc	1.08E-06	None
Xe-138	uCi/cc	3.18E-06	1E-04
Ar-41	uCi/cc	2.74E-08	None
NUCLIDE LOWER LIMITS OF DETECTION (LLD's) **2. Iodines**	**UNIT**	**LLD Value**	**ODCM Required LLD***
I-131	uCi/cc	7.86E-13	1E-12
I-133	uCi/cc	7.44E-12	1E-10
NUCLIDE LOWER LIMITS OF DETECTION (LLD's) **3. Particulates and Tritium**	**UNIT**	**LLD Value**	**ODCM Required LLD***
H-3	uCi/cc	2.95E-11	1E-06
Sr-89	uCi/cc	1.67E-13	1E-11
Sr-90	uCi/cc	3.06E-14	1E-11
Cs-134	uCi/cc	4.24E-13	1E-11
Cs-137	uCi/cc	5.58E-13	1E-11
Ba-140	uCi/cc	1.76E-12	None
La-140	uCi/cc	7.94E-12	None
Mn-54	uCi/cc	3.66E-13	1E-11
Co-58	uCi/cc	4.58E-13	1E-11
Fe-59	uCi/cc	8.25E-13	1E-11
Co-60	uCi/cc	9.04E-13	1E-11
Zn-65	uCi/cc	2.58E-12	1E-11
Mo-99	uCi/cc	8.86E-12	1E-11
Ce-141	uCi/cc	6.42E-13	1E-11
Ce-144	uCi/cc	2.39E-12	1E-11
Ag-110m	uCi/cc	4.97E-13	None
Cr-51	uCi/cc	3.62E-12	None
Gross Alpha	uCi/cc	3.85E-14	1E-11

* ODCM REC LLD's for weekly samples. These may be increased by a factor of 10 for daily samples

Effluent & Waste Disposable Summary

LIQUID EFFLUENT LLD's (Most Restrictive)
BATCH MODE

NUCLIDE LOWER LIMITS OF DETECTION (LLD's) **3. Liquids**	**UNIT**	**LLD Value**	**ODCM Required LLD**
H-3	uCi/cc	3.19E-08	1E-05
Sr-89	uCi/cc	3.24E-08	5E-08
Sr-90	uCi/cc	1.66E-08	5E-08
Fe-55	uCi/cc	9.47E-07	1E-06
Kr-85	uCi/cc	1.59E-05	None
Kr-87	uCi/cc	2.15E-07	1E-05
Kr-88	uCi/cc	2.26E-07	1E-05
Xe-133	uCi/cc	1.55E-07	1E-05
Xe-133m	uCi/cc	4.22E-07	1E-05
Xe-135	uCi/cc	5.39E-08	1E-05
Xe-138	uCi/cc	8.16E-06	1E-05
Mn-54	uCi/cc	6.50E-08	5E-07
Co-58	uCi/cc	5.60E-08	5E-07
Co-60	uCi/cc	1.00E-07	5E-07
Zn-65	uCi/cc	1.26E-07	5E-07
Mo-99	uCi/cc	4.86E-07	5E-07
I-131	uCi/cc	5.69E-08	1E-06
Cs-134	uCi/cc	5.19E-08	5E-07
Cs-137	uCi/cc	6.51E-08	5E-07
Ce-141	uCi/cc	9.03E-08	5E-07
Ce-144	uCi/cc	3.97E-07	5E-06
Gross Alpha	uCi/cc	8.66E-08	1E-07
Fe-59	uCi/cc	1.16E-07	5E-07
Cr-51	uCi/cc	3.88E-07	None
Ag-110m	uCi/cc	5.60E-08	None

Supplemental Information

Facility: Quad Cities Nuclear Power Station (QCNPS) January – December 2009

Licensee: Exelon Generation Company

1. Regulatory Limits

   a. For Noble Gases:

      Dose rate (per site)
      1. Less than 500 mrem/year to the whole body
      2. Less than 3000 mrem/year to the skin.

      Dose Gamma Radiation (per unit)
      1. Less than or equal to 5 mrad/quarter.
      2. Less than or equal to 10 mrad/year.

      Beta Radiation (per unit)
      1. Less than or equal to 10 mrad/quarter.
      2. Less than or equal to 20 mrad/year.

   b,c. For Iodine-131, for Iodine-133, and for all radionuclides in particulate form with half-lives greater than 8 days.

      Dose Rate
      1. Less than 1500 mrem/year. (per site)

      Dose (per unit)
      1. Less than or equal to 7.5 mrem/quarter.
      2. Less than or equal to 15 mrem/year.

   d. For Liquid: (per unit)

      Less than or equal to 1.5 mrem to the whole body during any calendar quarter.
      Less than or equal to 5 mrem to any organ during any calendar quarter.
      Less than or equal to 3 mrem to the whole body during any calendar year.
      Less than or equal to 10 mrem to any organ during any calendar year.

Supplemental Information

2. Maximum Permissible Concentration

a,b,c. For fission and activation gases, iodines, and particulates with half-lives greater than 8 days, allowable release limits are calculated by solving equations 2.0-5 and 2.0-6 from the Offsite Dose Calculation Manual Part II Chapter 2. The alarm setpoint is conservatively set at approximately 10% of the 10CFR20 limit.

d. For liquid effluents, allowable release limits are calculated by solving equations 2.0-1 and 2.0-2 from the Offsite Dose Calculation Manual Part II Chapter 2. The MPC values used for the monitors were as follows:

Radwaste discharge	1.55E-05 µCi/ml
Service water	1.00E-05 µCi/ml

3. Average Energy

The average gamma energy used to calculate the alarm setpoints for the noble gas monitors was:

9.69E-01 MeV for Quarter 1
9.66E-01 MeV for Quarter 2
9.56E-01 MeV for Quarter 3
9.73E-01 MeV for Quarter 4

4. Measurements and Approximations of Total Radioactivity

a. Fission and Activation Gases
b. Iodines
c. Particulates

a,b,c. The main chimney and reactor building ventilation exhaust systems are continually monitored for iodines and particulates. These samples are pulled every 7 days and analyzed by gamma isotopic. The particulate papers are composited every 31 days and sent to a vendor for Sr-89/90 and gross alpha analysis. Noble gas grab samples are pulled and analyzed by gamma isotopic weekly. Tritium samples are pulled and analyzed every month.

The Sr-89/90 and gross alpha curies released values reported are actual. On a real time basis, the portion of the "percent of applicable limit" for these contributors is reported based on projections using the previous available data. The actual results are obtained by editing the ODCM software inputs when the vendor results become available. Therefore, the "percent of applicable limits" in this report are actual.

Supplemental Information

The continuous strip chart recorders for the monitors on the release points are reviewed for spikes and the activity released is calculated. An additional calculated activity for noble gases is added to the main chimney release each month. This calculation is done because most of the grab samples show less than the lower limit of detection due to the low amount of activity and the large dilution flow at the sample point. The calculation takes into account the normal offgas train and the gland steam contribution to the release.

The average flow at the release points is used to calculate the curies released.

There are no ground level releases from QCNPS. All monitored releases are considered either elevated or mixed mode.

d. Liquid Effluents

The River Discharge Tanks are analyzed before discharge by gamma isotopic. A composite representative portion of this sample is saved. This is composited with other discharges that occurred every 31 days and is analyzed for tritium and gross alpha. The monthly composites are composited quarterly and sent to a vendor for Sr-89/90 and Fe-55 analyses. The discharge bay is sampled every 31 days and analyzed by gamma isotopic for tritium and gross alpha. It is sampled quarterly and sent to a vendor for Sr-89/90 and Fe-55 analysis. On a real time basis, the portion of the "percent of applicable limit" for these contributors is based on projections using scaling factors. The actual results are obtained by editing the ODCM software inputs when the vendor results become available. Therefore, the "percent of applicable limits" in this report are actual.

The tank volumes and activities are used to calculate the curies released for the River Discharge Tank. The total water released during the quarter and the activity is used to calculate the diluted activity released at the discharge bay, from batch discharges.

e. Estimated Total Error Percent

The estimated total error percents were calculated by taking the square root of the sum of the squares of errors for sampling and measurement parameters.

f. Less than the Lower Limit of Detection (<LLD)

Samples are analyzed such that the Technical Specification LLD requirements are met. When a nuclide is not detected during the quarter, then <LLD is reported. The most conservative LLD's used for counting effluent samples are included in this report.

Supplemental Information

5. Batch Releases

   a. Liquid

1.	Number of releases:	9
2.	Total time:	7.89E+03 minutes
3.	Maximum time:	9.19E+02 minutes
4.	Average time:	8.77E+02 minutes
5.	Minimum time:	8.44E+02 minutes
6.	Average stream flow:	63.8 gpm (discharge)
		2.94E+05 gpm (dilution)

   b. Gaseous

      1. NONE

6. Abnormal Releases

   a. Liquid

      1. A Small Amount of radioactivity was observed in a U-1 Kinghole Service Water Sample, which coincided with the start of the 1A and 1B RHRSW pumps following work on the heat exchangers during Q1R20. An isotopic analysis was performed which showed Cobalt-60 (Co-60) at 1.46E-08 uci/mL and Cesium-137 (Cs-137) at 1.03E-08 uCi/mL. This activity is well below the required Lower Limit of Detection for liquid effluents of 5E-07 uCi/mL. The total activity is estimated to be 9.00E-02 uCi of Co-60 and 6.00E-02 uCi of Cs-137. The sample was also analyzed for Tritium (H-3) with a result of 5.23E-06 uCi/ml (32.4 uCi). These activity estimates are based on one volume of the service water side of the heat exchanger being discharged (1635 gallons). The sample was sent off site to be analyzed for Sr-89, Sr-90, and Fe-55, which yielded no positive results. This nominal amount of radioacitivity attributed to this release was included in the stations monthly effluent dose calculations.

   b. Gaseous

      1. NONE

7. Radiological Impact on Man

   a. Liquid Dose to a Member of the Public for 2009

      Total Body: 9.39E-03 mrem

      Organ: 1.49E-02 mrem

b. Gaseous Dose to a Member of the Public for 2009

Total Body: 4.30E-03 mrem

Skin: 4.32E-04 mrem

Organ (Particulate/Iodine): 2.94E-01 mrem

c. Direct Radiation Dose to a Member of the Public for 2009

Total Body: 7.30E+00 mrem

29.2% of 40 CFR 190 Limit of 25 mrem/year (Whole Body and Organ). Thyroid dose of <1% of 40 CFR 190 Limit (75 mrem).

d. Total Body Doses to the Population and Average Doses to Individuals in the Population from All Receiving-Water-Related-Pathways:

Not applicable for QCNPS

e. Total Body Doses to the Population and Average Doses to Individuals in the Population from Gaseous Effluents to a Distance of 50 Miles:

Not applicable for QCNPS

f. Doses From Liquid and Gaseous Effluent to Members of the Public Due to Their Activities Inside the Site Boundary for the Report Period:

Not applicable for QCNPS. Any member of the public that is onsite for a significant period will be issued a Thermo Luminescent Dosimeter (TLD).

g. Liquid and Gaseous Effluent Radiation Monitors and Instrumentation Unavailability for the Period Beyond the Requirements of the ODCM, Including Sampling Deviation:

No ODCM monitors were unavailable for greater than 30 days in 2009.

10CFR20.1301(a)(1) Compliance Assessment

Quad Cities Station Unit One and Unit Two

Assessment Period 01/01/09 THROUGH 12/31/09

10CFR20.1301(a)(1) Limit 100.0 mrem/year

Quad Cities Unit 1

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Total	% of Limit
TEDE (mrem)	9.67E-01	6.27E-01	9.71E-01	1.03E+00	3.60E+00	**3.60**

Quad Cities Unit 2

	1st Quarter	2nd Quarter	3rd Quarter	4th Quarter	Year Total	% of Limit
TEDE (mrem)	9.68E-01	9.95E-01	1.02E+00	1.03E+00	4.01E+00	**4.01**

Submitted by: Blake A. Young Date: 4/23/10
Blake A. Young

Reviewed by: James G. Wooldridge Date: 4/23/10
James G. Wooldridge

Maximum Doses Resulting From Airborne Releases/Compliance Status

Quad Cities Station - *Unit One/Unit Two*

Type of Dose	Unit One Annual	Unit Two Annual	10 CFR 50 APP. I Yearly Objective	Unit One % of APP. I	Unit Two % of APP. I
Gamma Air (mrad)	3.87E-03	3.87E-03	10.0	3.87E-02	3.87E-02
Beta Air (mrad)	7.45E-03	7.45E-03	20.0	3.73E-02	3.73E-02
Organ (mrem)	1.54E-01	1.54E-01	15.0	1.03E+00	1.03E+00
Critical Person	Infant	Infant		Infant	Infant
Critical Organ	Thyroid	Thyroid		Thyroid	Thyroid

The calculation of the above doses was done by an independent contractor utilizing GASPAR, an NRC approved program. The calculation was done with current year meteorological data and equation mutipliers outlined in Reg Guide 1.109 and NUREG 0133.

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Extremely Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	3	0	0	0	4
NNE	0	0	8	0	0	0	8
NE	0	0	5	0	0	0	5
ENE	0	2	0	0	0	0	2
E	0	1	0	0	0	0	1
ESE	0	0	0	4	4	0	8
SE	0	4	22	0	0	0	26
SSE	0	12	10	0	0	0	22
S	0	14	2	0	0	0	16
SSW	0	14	4	0	0	0	18
SW	0	6	5	1	0	0	12
WSW	0	0	2	0	0	0	2
W	0	0	5	0	0	0	5
WNW	0	0	7	4	0	0	11
NW	0	2	11	0	0	0	13
NNW	0	1	9	0	0	0	10
Variable	0	0	0	0	0	0	0
Total	0	57	93	9	4	0	163

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Moderately Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

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

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Slightly Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	7	0	0	0	11
NNE	0	2	2	0	0	0	4
NE	0	2	4	0	0	0	6
ENE	0	6	1	1	0	0	8
E	0	2	0	0	0	0	2
ESE	0	0	0	2	0	0	2
SE	0	2	4	1	0	0	7
SSE	0	5	2	0	0	0	7
S	0	4	2	0	0	0	6
SSW	0	5	0	0	0	0	5
SW	0	3	1	0	0	0	4
WSW	0	2	4	0	0	0	6
W	0	3	11	0	0	0	14
WNW	0	5	10	7	0	0	22
NW	0	9	6	1	0	0	16
NNW	0	9	7	0	0	0	16
Variable	0	0	0	0	0	0	0
Total	0	63	61	12	0	0	136

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Neutral - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	31	22	8	0	0	66
NNE	8	18	9	6	0	0	41
NE	4	9	20	2	0	0	35
ENE	5	15	23	1	0	0	44
E	3	12	16	2	0	0	33
ESE	2	33	32	12	1	0	80
SE	2	30	12	4	0	0	48
SSE	8	25	6	0	0	0	39
S	7	11	6	0	0	0	24
SSW	4	13	2	0	0	0	19
SW	3	14	8	3	0	0	28
WSW	8	23	17	4	0	0	52
W	4	43	53	13	4	0	117
WNW	1	50	77	37	3	0	168
NW	6	59	100	12	0	0	177
NNW	2	25	37	1	0	0	65
Variable	0	0	0	0	0	0	0
Total	72	411	440	105	8	0	1036

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Slightly Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	19	1	0	0	0	22
NNE	5	4	0	0	0	0	9
NE	2	9	1	0	0	0	12
ENE	6	9	4	0	0	0	19
E	5	16	2	1	0	0	24
ESE	9	41	20	7	0	0	77
SE	2	30	9	4	0	0	45
SSE	8	36	3	0	0	0	47
S	5	10	5	0	0	0	20
SSW	6	13	8	2	0	0	29
SW	1	10	9	0	0	0	20
WSW	6	18	4	0	0	0	28
W	10	24	12	0	0	0	46
WNW	8	33	16	0	0	0	57
NW	13	52	1	0	0	0	66
NNW	1	27	0	0	0	0	28
Variable	0	0	0	0	0	0	0
Total	89	351	95	14	0	0	549

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Moderately Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	0	0	0	0	2
NNE	1	1	0	0	0	0	2
NE	1	1	0	0	0	0	2
ENE	4	2	0	0	0	0	6
E	2	6	0	0	0	0	8
ESE	10	18	0	0	0	0	28
SE	14	14	0	0	0	0	28
SSE	5	10	0	0	0	0	15
S	4	2	0	0	0	0	6
SSW	1	1	0	0	0	0	2
SW	3	0	0	0	0	0	3
WSW	1	0	0	0	0	0	1
W	4	4	0	0	0	0	8
WNW	8	2	0	0	0	0	10
NW	1	1	0	0	0	0	2
NNW	0	2	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	61	64	0	0	0	0	125

Hours of calm in this stability class: 7
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 3

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Extremely Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	0	0	0	0	0	2
NNE	2	0	0	0	0	0	2
NE	2	0	0	0	0	0	2
ENE	1	1	0	0	0	0	2
E	8	0	0	0	0	0	8
ESE	20	17	0	0	0	0	37
SE	11	3	0	0	0	0	14
SSE	13	0	0	0	0	0	13
S	4	0	0	0	0	0	4
SSW	2	0	0	0	0	0	2
SW	1	0	0	0	0	0	1
WSW	1	0	0	0	0	0	1
W	1	0	0	0	0	0	1
WNW	1	1	0	0	0	0	2
NW	1	0	0	0	0	0	1
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	71	22	0	0	0	0	93

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Extremely Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	4	0	0	4
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	3	0	3
SE	0	0	1	11	0	0	12
SSE	0	0	2	5	2	1	10
S	0	0	0	3	0	2	5
SSW	0	0	6	1	2	1	10
SW	0	0	1	0	1	0	2
WSW	0	0	0	0	0	0	0
W	0	0	0	0	1	0	1
WNW	0	0	0	0	3	0	3
NW	0	0	0	2	0	0	2
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	10	26	12	4	52

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Moderately Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	1	0	0	2
NNE	0	0	2	3	0	0	5
NE	0	0	1	0	0	0	1
ENE	0	0	0	0	0	0	0
E	0	0	0	0	0	0	0
ESE	0	0	0	0	1	0	1
SE	0	0	2	3	0	0	5
SSE	0	1	3	1	1	0	6
S	0	0	1	3	1	0	5
SSW	0	0	3	1	2	1	7
SW	0	0	0	1	0	0	1
WSW	0	0	0	1	0	0	1
W	0	0	0	0	3	0	3
WNW	0	0	0	3	2	0	5
NW	0	0	4	2	1	0	7
NNW	0	0	4	0	2	0	6
Variable	0	0	0	0	0	0	0
Total	0	1	21	19	13	1	55

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Slightly Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	3	3	0	0	6
NNE	0	0	3	2	0	0	5
NE	0	1	2	2	1	0	6
ENE	0	3	5	0	0	0	8
E	0	0	0	0	0	0	0
ESE	0	1	0	1	1	4	7
SE	0	2	1	6	1	1	11
SSE	0	5	1	3	2	0	11
S	0	2	1	4	3	0	10
SSW	0	7	3	2	0	0	12
SW	0	1	1	1	0	0	3
WSW	0	0	0	1	0	0	1
W	0	0	0	8	1	0	9
WNW	0	0	4	5	2	0	11
NW	0	0	6	4	2	0	12
NNW	0	0	9	0	1	0	10
Variable	0	0	0	0	0	0	0
Total	0	22	39	42	14	5	122

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: 3

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Neutral - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	12	11	16	9	0	48
NNE	1	10	10	11	9	0	41
NE	2	5	8	29	13	0	57
ENE	2	5	8	21	5	0	41
E	1	2	8	15	6	3	35
ESE	1	5	9	19	16	13	63
SE	1	9	13	25	9	7	64
SSE	0	6	5	17	12	3	43
S	2	9	1	9	13	2	36
SSW	0	8	3	9	6	1	27
SW	1	5	7	8	10	9	40
WSW	1	4	9	19	13	0	46
W	1	8	37	43	26	20	135
WNW	0	4	40	67	56	33	200
NW	1	18	26	62	50	8	165
NNW	2	11	20	40	12	1	86
Variable	0	0	0	0	0	0	0
Total	16	121	215	410	265	100	1127

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: 3

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Slightly Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	7	21	5	0	33
NNE	1	1	4	4	0	0	10
NE	0	1	4	4	1	0	10
ENE	1	2	5	2	1	0	11
E	0	0	5	8	1	1	15
ESE	2	5	8	22	9	13	59
SE	0	3	14	23	9	6	55
SSE	0	2	11	27	18	2	60
S	0	1	2	20	8	6	37
SSW	0	3	5	12	8	12	40
SW	0	0	4	6	3	3	16
WSW	0	1	6	14	2	0	23
W	1	4	13	25	13	0	56
WNW	1	4	11	26	11	0	53
NW	0	2	18	17	1	0	38
NNW	1	1	20	27	7	0	56
Variable	0	0	0	0	0	0	0
Total	7	30	137	258	97	43	572

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Moderately Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	1	1	0	0	6
NNE	0	1	1	2	0	0	4
NE	0	0	1	2	0	0	3
ENE	0	1	3	0	0	0	4
E	0	2	6	2	0	0	10
ESE	0	1	2	3	1	0	7
SE	0	0	4	13	6	0	23
SSE	0	1	6	17	2	1	27
S	0	2	6	8	4	0	20
SSW	0	1	3	12	2	0	18
SW	0	1	2	1	0	0	4
WSW	0	0	4	1	0	0	5
W	0	3	3	1	1	0	8
WNW	1	3	0	1	0	0	5
NW	0	1	1	3	1	0	6
NNW	0	1	3	0	0	0	4
Variable	0	0	0	0	0	0	0
Total	1	22	46	67	17	1	154

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: January - March 2009
Stability Class - Extremely Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
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	1	0	1	0	0	2
E	0	0	0	0	0	0	0
ESE	0	0	0	0	0	0	0
SE	0	0	2	3	0	0	5
SSE	0	0	9	9	0	0	18
S	0	2	5	4	3	0	14
SSW	0	1	3	3	1	0	8
SW	0	1	1	2	0	0	4
WSW	0	1	0	1	0	0	2
W	0	0	0	0	0	0	0
WNW	0	0	0	1	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	7	21	24	4	0	56

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Extremely Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	5	2	0	0	10
NNE	0	4	13	3	0	0	20
NE	0	3	5	5	0	0	13
ENE	0	10	15	0	0	0	25
E	0	2	7	1	0	0	10
ESE	0	2	17	3	0	0	22
SE	0	5	6	3	0	0	14
SSE	0	5	6	0	0	0	11
S	0	6	3	0	0	0	9
SSW	0	8	7	0	0	0	15
SW	0	18	14	0	0	0	32
WSW	0	5	3	4	0	0	12
W	0	13	13	2	0	0	28
WNW	1	5	19	3	0	0	28
NW	0	6	29	10	0	0	45
NNW	0	2	4	2	0	0	8
Variable	0	0	0	0	0	0	0
Total	1	97	166	38	0	0	302

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Moderately Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	5	0	0	0	0	6
NNE	0	0	1	0	0	0	1
NE	0	3	1	0	0	0	4
ENE	0	3	0	0	0	0	3
E	0	5	3	0	0	0	8
ESE	0	1	2	0	0	0	3
SE	0	2	3	0	0	0	5
SSE	0	0	0	0	0	0	0
S	0	1	0	0	0	0	1
SSW	0	3	1	0	0	0	4
SW	0	2	0	0	0	0	2
WSW	0	2	2	0	0	0	4
W	0	3	7	0	0	0	10
WNW	0	5	1	1	0	0	7
NW	1	1	4	0	0	0	6
NNW	0	3	0	0	0	0	3
Variable	0	0	0	0	0	0	0
Total	2	39	25	1	0	0	67

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Slightly Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	7	3	1	0	0	11
NNE	0	6	1	1	0	0	8
NE	0	10	4	1	0	0	15
ENE	0	11	4	1	0	0	16
E	0	10	3	0	0	0	13
ESE	0	6	8	2	0	0	16
SE	0	5	3	0	0	0	8
SSE	1	1	1	0	0	0	3
S	1	8	0	0	0	0	9
SSW	0	3	0	0	0	0	3
SW	0	10	0	0	0	0	10
WSW	1	10	3	2	0	0	16
W	1	9	7	1	0	0	18
WNW	0	13	7	1	0	0	21
NW	0	2	10	3	0	0	15
NNW	1	9	5	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	5	120	59	13	0	0	197

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Neutral - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	15	23	4	0	0	43
NNE	5	13	15	0	0	0	33
NE	2	25	18	5	0	0	50
ENE	6	26	24	4	0	0	60
E	4	43	27	7	0	0	81
ESE	3	24	25	0	0	0	52
SE	6	25	14	2	0	0	47
SSE	4	8	0	0	0	0	12
S	7	9	1	0	0	0	17
SSW	2	12	1	0	0	0	15
SW	5	16	2	0	0	0	23
WSW	7	8	11	3	0	0	29
W	6	24	16	2	0	0	48
WNW	5	20	25	12	0	0	62
NW	5	44	47	7	0	0	103
NNW	3	24	24	0	0	0	51
Variable	0	0	0	0	0	0	0
Total	71	336	273	46	0	0	726

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Slightly Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	9	0	0	0	0	15
NNE	8	14	0	0	0	0	22
NE	6	14	2	0	0	0	22
ENE	21	23	5	0	0	0	49
E	11	17	1	0	0	0	29
ESE	9	25	4	0	0	0	38
SE	13	25	5	0	0	0	43
SSE	14	7	0	0	0	0	21
S	13	6	1	0	0	0	20
SSW	4	20	4	0	0	0	28
SW	18	19	10	0	0	0	47
WSW	20	28	3	0	0	0	51
W	13	40	2	0	0	0	55
WNW	18	16	8	0	0	0	42
NW	10	22	3	0	0	0	35
NNW	8	17	1	0	0	0	26
Variable	0	0	0	0	0	0	0
Total	192	302	49	0	0	0	543

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Moderately Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	12	0	0	0	0	0	12
NNE	8	1	0	0	0	0	9
NE	4	0	0	0	0	0	4
ENE	14	2	0	0	0	0	16
E	14	0	0	0	0	0	14
ESE	22	11	0	0	0	0	33
SE	6	1	0	0	0	0	7
SSE	7	3	0	0	0	0	10
S	6	2	0	0	0	0	8
SSW	8	1	0	0	0	0	9
SW	9	1	0	0	0	0	10
WSW	6	0	0	0	0	0	6
W	6	4	0	0	0	0	10
WNW	10	4	0	0	0	0	14
NW	15	5	0	0	0	0	20
NNW	9	0	0	0	0	0	9
Variable	0	0	0	0	0	0	0
Total	156	35	0	0	0	0	191

Hours of calm in this stability class: 11
Hours of missing wind measurements in this stability class: 1
Hours of missing stability measurements in all stability classes: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Extremely Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	1	0	0	0	0	4
NNE	2	0	0	0	0	0	2
NE	7	0	0	0	0	0	7
ENE	3	0	0	0	0	0	3
E	10	0	0	0	0	0	10
ESE	18	5	0	0	0	0	23
SE	13	0	0	0	0	0	13
SSE	11	0	0	0	0	0	11
S	6	0	0	0	0	0	6
SSW	4	0	0	0	0	0	4
SW	1	0	0	0	0	0	1
WSW	1	0	0	0	0	0	1
W	2	0	0	0	0	0	2
WNW	7	2	0	0	0	0	9
NW	3	1	0	0	0	0	4
NNW	5	0	0	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	96	9	0	0	0	0	105

Hours of calm in this stability class: 28
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Extremely Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	1	0	0	1
NNE	0	0	0	5	0	3	8
NE	0	0	4	1	0	3	8
ENE	0	0	3	3	0	0	6
E	0	0	0	0	0	0	0
ESE	0	0	0	4	3	0	7
SE	0	0	0	0	4	0	4
SSE	0	0	0	2	5	2	9
S	0	0	2	2	3	4	11
SSW	0	0	2	9	11	1	23
SW	0	0	1	1	0	0	2
WSW	0	0	0	0	1	1	2
W	0	0	0	1	0	0	1
WNW	0	0	0	4	3	0	7
NW	0	0	0	4	3	1	8
NNW	0	0	0	0	4	0	4
Variable	0	0	0	0	0	0	0
Total	0	0	12	37	37	15	101

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Moderately Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	2	2	0	0	4
NNE	0	2	0	4	1	0	7
NE	0	0	2	2	0	0	4
ENE	0	0	13	3	0	0	16
E	0	0	2	3	1	0	6
ESE	0	0	4	6	1	0	11
SE	0	0	1	0	0	1	2
SSE	0	0	1	0	0	0	1
S	0	0	1	1	0	1	3
SSW	0	0	2	1	1	0	4
SW	0	0	3	0	0	0	3
WSW	0	0	1	3	2	1	7
W	0	1	2	6	0	0	9
WNW	0	0	3	5	9	0	17
NW	0	0	3	4	6	3	16
NNW	0	0	0	0	1	0	1
Variable	0	0	0	0	0	0	0
Total	0	3	40	40	22	6	111

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Slightly Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	5	2	0	0	10
NNE	0	3	2	0	0	0	5
NE	0	3	3	1	0	2	9
ENE	0	7	7	3	0	0	17
E	0	1	9	1	1	0	12
ESE	0	0	3	4	2	0	9
SE	0	1	3	5	1	0	10
SSE	0	0	1	2	1	0	4
S	0	0	0	3	1	0	4
SSW	0	0	4	3	3	0	10
SW	0	6	2	2	0	0	10
WSW	1	2	2	1	0	1	7
W	0	6	8	13	0	0	27
WNW	0	3	8	4	3	0	18
NW	0	4	4	8	5	3	24
NNW	1	3	3	0	2	1	10
Variable	0	0	0	0	0	0	0
Total	2	42	64	52	19	7	186

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Neutral - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	10	7	18	10	0	48
NNE	0	11	10	19	5	0	45
NE	0	9	23	26	6	6	70
ENE	0	10	19	23	14	4	70
E	0	7	29	35	9	0	80
ESE	0	4	14	32	7	2	59
SE	2	9	5	8	10	4	38
SSE	0	6	10	9	4	2	31
S	1	13	3	14	8	0	39
SSW	1	6	3	11	3	0	24
SW	2	9	7	10	3	0	31
WSW	1	6	7	8	9	4	35
W	4	13	12	23	6	4	62
WNW	2	7	13	20	26	13	81
NW	2	10	24	36	32	6	110
NNW	2	12	21	26	19	0	80
Variable	0	0	0	0	0	0	0
Total	20	142	207	318	171	45	903

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Slightly Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	4	5	0	0	14
NNE	0	5	12	11	0	0	28
NE	1	1	13	10	0	0	25
ENE	3	1	13	12	5	0	34
E	1	12	20	10	1	0	44
ESE	0	3	8	15	10	0	36
SE	1	6	11	12	4	3	37
SSE	0	1	7	9	3	2	22
S	0	1	14	17	12	3	47
SSW	1	3	10	24	14	12	64
SW	0	0	10	9	2	0	21
WSW	1	1	15	16	1	0	34
W	1	1	15	30	9	0	56
WNW	0	2	12	20	8	0	42
NW	0	7	10	21	3	1	42
NNW	1	3	8	8	4	0	24
Variable	0	0	0	0	0	0	0
Total	10	52	182	229	76	21	570

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Moderately Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	7	5	1	0	15
NNE	0	3	6	0	0	0	9
NE	0	4	8	1	0	0	13
ENE	1	3	6	0	0	0	10
E	0	4	8	1	0	0	13
ESE	1	2	3	18	2	0	26
SE	1	1	4	14	0	0	20
SSE	0	2	8	6	0	2	18
S	0	3	5	5	0	0	13
SSW	0	2	4	5	0	0	11
SW	0	0	1	1	0	0	2
WSW	0	3	4	3	0	0	10
W	0	3	5	5	0	0	13
WNW	0	5	4	2	1	0	12
NW	0	0	4	3	0	0	7
NNW	0	2	5	5	0	0	12
Variable	0	0	0	0	0	0	0
Total	3	39	82	74	4	2	204

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: April - June 2009
Stability Class - Extremely Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	6	1	0	0	7
NNE	0	0	0	2	0	0	2
NE	0	5	3	1	0	0	9
ENE	0	2	2	0	0	0	4
E	1	6	3	0	0	0	10
ESE	0	4	7	1	0	0	12
SE	0	1	4	1	0	0	6
SSE	1	1	6	5	0	0	13
S	0	2	5	2	0	0	9
SSW	0	2	0	2	0	0	4
SW	1	1	5	3	0	0	10
WSW	3	3	0	0	0	0	6
W	0	1	0	0	0	0	1
WNW	1	1	0	0	0	0	2
NW	0	2	2	0	0	0	4
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	8	31	43	18	0	0	100

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: 8

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Extremely Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	12	3	0	0	0	15
NNE	0	2	0	0	0	0	2
NE	0	4	0	0	0	0	4
ENE	0	16	8	0	0	0	24
E	0	24	1	0	0	0	25
ESE	0	17	0	0	0	0	17
SE	0	8	1	0	0	0	9
SSE	0	7	0	0	0	0	7
S	0	14	0	0	0	0	14
SSW	0	14	2	0	0	0	16
SW	0	10	2	0	0	0	12
WSW	0	4	0	0	0	0	4
W	0	13	1	0	0	0	14
WNW	0	6	2	0	0	0	8
NW	0	11	7	0	0	0	18
NNW	0	13	2	0	0	0	15
Variable	0	0	0	0	0	0	0
Total	0	175	29	0	0	0	204

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: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Moderately Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	0	0	0	0	2
NNE	1	2	0	0	0	0	3
NE	0	1	0	0	0	0	1
ENE	0	9	0	0	0	0	9
E	0	5	0	0	0	0	5
ESE	0	10	0	0	0	0	10
SE	0	4	0	0	0	0	4
SSE	0	3	0	0	0	0	3
S	1	4	0	0	0	0	5
SSW	0	3	0	0	0	0	3
SW	0	2	1	0	0	0	3
WSW	0	6	1	0	0	0	7
W	0	8	2	0	0	0	10
WNW	0	2	4	1	0	0	7
NW	0	14	2	0	0	0	16
NNW	0	6	0	0	0	0	6
Variable	0	0	0	0	0	0	0
Total	2	81	10	1	0	0	94

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: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Slightly Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Speed (in mph)

Wind Direction	1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	2	0	0	0	6
NNE	0	3	0	0	0	0	3
NE	0	7	1	0	0	0	8
ENE	1	9	0	0	0	0	10
E	0	23	1	0	0	0	24
ESE	0	11	0	0	0	0	11
SE	1	10	4	0	0	0	15
SSE	0	1	0	0	0	0	1
S	2	5	0	0	0	0	7
SSW	1	5	0	0	0	0	6
SW	0	7	0	0	0	0	7
WSW	3	7	3	0	0	0	13
W	1	17	5	0	0	0	23
WNW	1	8	5	4	0	0	18
NW	1	20	4	0	0	0	25
NNW	2	9	0	0	0	0	11
Variable	1	0	0	0	0	0	1
Total	14	146	25	4	0	0	189

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: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Neutral - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	7	16	2	0	0	0	25
NNE	6	9	0	0	0	0	15
NE	6	13	0	0	0	0	19
ENE	14	42	5	0	0	0	61
E	17	51	20	0	0	0	88
ESE	10	28	2	0	0	0	40
SE	6	27	5	0	0	0	38
SSE	6	6	1	0	0	0	13
S	2	15	0	0	0	0	17
SSW	5	10	4	0	0	0	19
SW	6	23	5	0	0	0	34
WSW	7	18	7	0	0	0	32
W	4	21	16	2	0	0	43
WNW	1	10	17	5	0	0	33
NW	16	74	13	2	0	0	105
NNW	4	25	3	0	0	0	32
Variable	1	1	0	0	0	0	2
Total	118	389	100	9	0	0	616

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: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Slightly Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	14	0	0	0	0	19
NNE	8	3	0	0	0	0	11
NE	16	8	0	0	0	0	24
ENE	24	14	1	0	0	0	39
E	30	12	0	0	0	0	42
ESE	27	18	0	0	0	0	45
SE	11	14	1	0	0	0	26
SSE	12	8	0	0	0	0	20
S	13	14	1	0	0	0	28
SSW	12	16	1	0	0	0	29
SW	16	26	5	0	0	0	47
WSW	16	14	1	0	0	0	31
W	16	30	1	0	0	0	47
WNW	19	23	0	0	0	0	42
NW	12	39	2	0	0	0	53
NNW	9	11	0	0	0	0	20
Variable	0	0	0	0	0	0	0
Total	246	264	13	0	0	0	523

Hours of calm in this stability class: 2
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Moderately Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	6	0	0	0	0	0	6
NNE	29	1	0	0	0	0	30
NE	33	2	0	0	0	0	35
ENE	11	1	0	0	0	0	12
E	14	0	0	0	0	0	14
ESE	25	3	0	0	0	0	28
SE	13	0	0	0	0	0	13
SSE	14	1	0	0	0	0	15
S	12	0	0	0	0	0	12
SSW	6	1	0	0	0	0	7
SW	6	1	0	0	0	0	7
WSW	8	0	0	0	0	0	8
W	11	1	0	0	0	0	12
WNW	18	3	0	0	0	0	21
NW	17	4	0	0	0	0	21
NNW	6	2	0	0	0	0	8
Variable	0	0	0	0	0	0	0
Total	229	20	0	0	0	0	249

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: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Extremely Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	12	0	0	0	0	0	12
NNE	25	0	0	0	0	0	25
NE	18	0	0	0	0	0	18
ENE	18	0	0	0	0	0	18
E	21	0	0	0	0	0	21
ESE	30	4	0	0	0	0	34
SE	12	0	0	0	0	0	12
SSE	2	0	0	0	0	0	2
S	3	0	0	0	0	0	3
SSW	1	0	0	0	0	0	1
SW	3	0	0	0	0	0	3
WSW	4	0	0	0	0	0	4
W	12	0	0	0	0	0	12
WNW	25	3	0	0	0	0	28
NW	7	0	0	0	0	0	7
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	195	7	0	0	0	0	202

Hours of calm in this stability class: 114
Hours of missing wind measurements in this stability class: 0
Hours of missing stability measurements in all stability classes: 5

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Extremely Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

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

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Moderately Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	3	2	0	0	6
NNE	0	0	2	0	0	0	2
NE	0	1	1	0	0	0	2
ENE	0	5	6	2	0	0	13
E	0	3	11	0	0	0	14
ESE	0	2	8	0	0	0	10
SE	0	1	1	0	0	0	2
SSE	0	1	2	0	0	0	3
S	0	0	7	5	0	0	12
SSW	0	0	10	4	1	0	15
SW	0	0	1	1	0	0	2
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	1	1	0	0	2
NW	0	0	1	3	0	0	4
NNW	0	0	6	1	0	0	7
Variable	0	0	0	0	0	0	0
Total	0	14	60	19	1	0	94

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Slightly Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	4	9	0	0	0	13
NNE	0	0	5	0	0	0	5
NE	0	3	1	0	0	0	4
ENE	0	11	9	1	0	0	21
E	0	10	9	0	0	0	19
ESE	0	11	6	0	0	0	17
SE	0	8	5	1	0	0	14
SSE	0	1	4	0	0	0	5
S	0	1	2	6	0	0	9
SSW	0	0	3	6	0	0	9
SW	0	2	2	1	0	0	5
WSW	0	2	4	1	1	0	8
W	0	4	11	2	0	0	17
WNW	0	2	2	4	1	1	10
NW	0	5	15	8	0	0	28
NNW	0	5	8	1	0	0	14
Variable	0	0	0	0	0	0	0
Total	0	69	95	31	2	1	198

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Neutral - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	6	14	7	0	0	29
NNE	2	4	7	5	1	0	19
NE	2	6	10	4	0	0	22
ENE	5	19	24	18	1	0	67
E	2	32	31	18	3	0	86
ESE	5	25	9	8	0	0	47
SE	4	16	16	21	6	1	64
SSE	2	16	5	5	2	0	30
S	2	5	7	9	4	1	28
SSW	1	6	8	13	6	0	34
SW	1	5	8	16	7	0	37
WSW	1	8	14	10	4	0	37
W	1	10	24	21	6	0	62
WNW	1	12	9	17	13	12	64
NW	4	14	33	33	6	5	95
NNW	2	17	32	9	3	0	63
Variable	0	2	0	0	0	0	2
Total	37	203	251	214	62	19	786

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Slightly Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	2	10	9	0	0	21
NNE	1	4	6	3	0	0	14
NE	1	4	2	4	0	0	11
ENE	2	5	14	5	0	0	26
E	0	10	17	6	0	1	34
ESE	1	5	11	16	3	0	36
SE	1	7	7	17	0	0	32
SSE	0	3	5	10	3	0	21
S	0	1	9	10	4	1	25
SSW	0	5	4	24	14	0	47
SW	0	6	14	7	12	2	41
WSW	0	2	13	8	0	0	23
W	1	1	14	13	1	1	31
WNW	1	3	15	29	0	0	48
NW	2	6	12	20	3	0	43
NNW	1	4	14	14	0	0	33
Variable	0	0	0	0	0	0	0
Total	11	68	167	195	40	5	486

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Moderately Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	2	7	10	2	0	0	21
NNE	4	4	5	3	0	0	16
NE	1	5	7	6	0	0	19
ENE	0	6	14	8	0	0	28
E	1	13	30	6	0	0	50
ESE	0	3	16	13	2	0	34
SE	1	2	5	5	1	0	14
SSE	0	1	6	6	1	0	14
S	1	0	3	14	2	0	20
SSW	1	1	8	13	0	0	23
SW	0	5	5	3	0	0	13
WSW	1	0	4	4	0	0	9
W	2	3	2	3	0	0	10
WNW	1	3	9	12	0	0	25
NW	2	2	1	4	1	0	10
NNW	1	3	5	4	0	0	13
Variable	0	0	0	0	0	0	0
Total	18	58	130	106	7	0	319

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: July - September 2009
Stability Class - Extremely Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	7	4	0	0	0	11
NNE	2	2	4	2	0	0	10
NE	3	3	7	0	0	0	13
ENE	7	7	7	1	0	0	22
E	2	13	11	2	0	0	28
ESE	4	6	11	9	1	0	31
SE	3	6	11	5	0	0	25
SSE	5	5	6	4	0	0	20
S	2	5	8	6	0	0	21
SSW	3	0	3	2	0	0	8
SW	2	2	4	0	0	0	8
WSW	0	1	3	0	0	0	4
W	1	2	2	0	0	0	5
WNW	0	1	0	0	0	0	1
NW	2	2	0	0	0	0	4
NNW	0	2	3	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	36	64	84	31	1	0	216

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: 89

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Extremely Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	1	1	0	0	0	2
NNE	0	0	1	0	0	0	1
NE	0	0	4	0	0	0	4
ENE	0	0	3	0	0	0	3
E	0	0	3	0	0	0	3
ESE	0	0	2	0	0	0	2
SE	0	2	1	0	0	0	3
SSE	0	5	6	0	0	0	11
S	0	2	7	0	0	0	9
SSW	0	17	1	0	0	0	18
SW	0	10	4	0	0	0	14
WSW	0	3	0	0	0	0	3
W	0	2	7	0	0	0	9
WNW	0	3	3	0	0	0	6
NW	0	1	5	0	0	0	6
NNW	0	0	2	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	0	46	50	0	0	0	96

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Moderately Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

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

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Slightly Unstable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	0	0	0	0	3
NNE	0	2	0	0	0	0	2
NE	0	0	1	0	0	0	1
ENE	0	1	0	0	0	0	1
E	0	0	5	0	0	0	5
ESE	0	2	1	0	0	0	3
SE	0	7	1	0	0	0	8
SSE	0	3	0	0	0	0	3
S	0	3	2	0	0	0	5
SSW	0	3	0	0	0	0	3
SW	0	4	0	0	0	0	4
WSW	0	2	1	0	0	0	3
W	0	10	6	0	0	0	16
WNW	0	1	3	0	0	0	4
NW	0	4	7	0	0	0	11
NNW	0	4	1	0	0	0	5
Variable	0	0	0	0	0	0	0
Total	0	49	28	0	0	0	77

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Neutral - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	5	32	27	0	0	0	64
NNE	4	22	10	0	0	0	36
NE	5	29	26	2	0	0	62
ENE	11	22	23	2	0	0	58
E	7	53	53	6	0	0	119
ESE	3	42	29	2	0	0	76
SE	8	40	11	1	0	0	60
SSE	8	19	1	0	0	0	28
S	7	14	2	0	0	0	23
SSW	9	15	11	0	0	0	35
SW	6	16	9	3	0	0	34
WSW	8	23	25	3	0	0	59
W	4	73	93	20	0	0	190
WNW	4	37	67	14	0	0	122
NW	9	56	44	0	0	0	109
NNW	4	15	10	0	0	0	29
Variable	0	0	0	0	0	0	0
Total	102	508	441	53	0	0	1104

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Slightly Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	11	0	0	0	0	14
NNE	2	6	0	0	0	0	8
NE	2	17	5	3	0	0	27
ENE	11	17	5	0	0	0	33
E	19	20	19	4	0	0	62
ESE	16	33	15	13	2	0	79
SE	17	40	8	0	0	0	65
SSE	11	29	4	0	0	0	44
S	8	18	1	0	0	0	27
SSW	6	33	2	0	0	0	41
SW	8	30	5	0	0	0	43
WSW	9	27	7	0	0	0	43
W	17	21	1	0	0	0	39
WNW	7	22	0	0	0	0	29
NW	6	28	4	0	0	0	38
NNW	1	11	0	0	0	0	12
Variable	0	0	0	0	0	0	0
Total	143	363	76	20	2	0	604

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Moderately Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	0	0	0	0	0	3
NNE	1	1	0	0	0	0	2
NE	4	2	0	0	0	0	6
ENE	7	2	0	0	0	0	9
E	18	2	0	0	0	0	20
ESE	17	32	0	0	0	0	49
SE	12	13	0	0	0	0	25
SSE	11	4	0	0	0	0	15
S	2	4	0	0	0	0	6
SSW	3	0	0	0	0	0	3
SW	5	0	0	0	0	0	5
WSW	2	0	0	0	0	0	2
W	3	0	0	0	0	0	3
WNW	8	3	0	0	0	0	11
NW	8	0	0	0	0	0	8
NNW	1	0	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	105	63	0	0	0	0	168

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: 0

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Extremely Stable - 196Ft-33Ft Delta-T (F)
Winds Measured at 33 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	3	0	0	0	0	0	3
NNE	2	0	0	0	0	0	2
NE	6	0	0	0	0	0	6
ENE	2	0	0	0	0	0	2
E	8	0	0	0	0	0	8
ESE	24	23	0	0	0	0	47
SE	9	0	0	0	0	0	9
SSE	4	0	0	0	0	0	4
S	3	0	0	0	0	0	3
SSW	5	0	0	0	0	0	5
SW	0	0	0	0	0	0	0
WSW	0	0	0	0	0	0	0
W	2	0	0	0	0	0	2
WNW	0	1	0	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	2	0	0	0	0	0	2
Variable	0	0	0	0	0	0	0
Total	70	24	0	0	0	0	94

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Extremely Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	0	0	0	0	0
NE	0	0	0	0	0	0	0
ENE	0	0	0	1	0	0	1
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	1	0	0	1
S	0	0	0	1	4	0	5
SSW	0	0	0	10	1	0	11
SW	0	0	0	1	0	0	1
WSW	0	0	0	0	0	0	0
W	0	0	0	0	0	0	0
WNW	0	0	0	0	0	0	0
NW	0	0	0	0	0	0	0
NNW	0	0	0	0	0	0	0
Variable	0	0	0	0	0	0	0
Total	0	0	0	14	5	0	19

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Moderately Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	1	0	0	2
NNE	0	0	0	1	0	0	1
NE	0	0	0	4	0	0	4
ENE	0	0	0	2	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	0	2	0	0	2
S	0	0	1	4	2	0	7
SSW	0	0	4	5	0	0	9
SW	0	0	1	3	0	0	4
WSW	0	0	1	0	0	0	1
W	0	0	1	5	0	0	6
WNW	0	0	1	2	1	0	4
NW	0	0	0	3	1	0	4
NNW	0	0	0	1	0	0	1
Variable	0	0	0	0	0	0	0
Total	0	0	10	33	4	0	47

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Slightly Unstable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	0	0	0	0	0
NNE	0	0	1	0	0	0	1
NE	0	0	0	0	0	0	0
ENE	0	0	2	2	0	0	4
E	0	0	0	1	0	0	1
ESE	0	0	4	2	0	0	6
SE	0	1	6	1	0	0	8
SSE	0	2	3	3	1	0	9
S	0	0	2	1	1	0	4
SSW	0	0	1	3	1	0	5
SW	0	0	4	2	1	0	7
WSW	0	0	4	2	0	0	6
W	0	0	5	5	0	0	10
WNW	0	0	2	4	0	0	6
NW	0	0	2	5	0	0	7
NNW	0	0	2	3	1	0	6
Variable	0	0	0	0	0	0	0
Total	0	3	38	34	5	0	80

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Neutral - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	5	18	28	5	0	56
NNE	2	5	19	18	0	0	44
NE	2	3	14	27	13	3	62
ENE	3	8	8	24	26	2	71
E	1	9	40	38	29	2	119
ESE	2	9	28	42	18	14	113
SE	2	11	25	17	13	8	76
SSE	1	6	11	12	9	1	40
S	1	9	14	9	7	1	41
SSW	3	13	17	9	21	1	64
SW	3	14	10	19	10	5	61
WSW	1	14	16	16	8	2	57
W	1	15	41	58	49	8	172
WNW	1	15	28	69	30	17	160
NW	1	17	37	46	21	0	122
NNW	2	6	15	21	2	0	46
Variable	0	0	0	0	0	0	0
Total	26	159	341	453	261	64	1304

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Slightly Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	3	7	8	0	0	18
NNE	0	0	8	3	1	0	12
NE	0	0	5	12	2	3	22
ENE	0	4	6	8	0	0	18
E	0	5	14	2	0	0	21
ESE	0	2	7	18	1	7	35
SE	1	8	13	27	0	1	50
SSE	0	4	8	29	6	0	47
S	0	7	10	24	15	1	57
SSW	1	1	9	43	17	1	72
SW	1	2	8	7	9	1	28
WSW	0	1	2	19	2	0	24
W	2	1	9	15	1	0	28
WNW	0	3	15	5	0	0	23
NW	0	0	10	20	3	0	33
NNW	0	3	8	6	0	0	17
Variable	0	0	0	0	0	0	0
Total	5	44	139	246	57	14	505

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Moderately Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	0	0	1	0	0	0	1
NNE	1	1	2	0	0	0	4
NE	0	0	1	0	0	0	1
ENE	0	1	1	4	1	0	7
E	0	0	6	2	0	0	8
ESE	0	0	2	6	3	0	11
SE	0	0	1	23	6	0	30
SSE	0	4	7	14	4	0	29
S	0	0	3	4	1	0	8
SSW	0	0	7	6	1	0	14
SW	0	1	1	0	0	0	2
WSW	0	2	1	0	0	0	3
W	1	3	5	0	0	0	9
WNW	0	0	5	0	0	0	5
NW	0	1	9	1	0	0	11
NNW	0	4	10	2	0	0	16
Variable	0	0	0	0	0	0	0
Total	2	17	62	62	16	0	159

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

Joint Frequency Tables

Quad Cities Generating Station

Period of Record: October - December 2009
Stability Class - Extremely Stable - 296Ft-33Ft Delta-T (F)
Winds Measured at 296 Feet

Wind Direction	Wind Speed (in mph) 1-3	4-7	8-12	13-18	19-24	> 24	Total
N	1	0	1	0	0	0	2
NNE	0	1	0	0	0	0	1
NE	0	1	3	0	0	0	4
ENE	0	2	0	0	0	0	2
E	0	3	3	3	0	0	9
ESE	0	2	3	2	2	0	9
SE	1	0	0	2	2	0	5
SSE	0	1	3	1	0	0	5
S	0	1	7	0	0	0	8
SSW	0	3	11	6	4	0	24
SW	0	1	4	1	0	0	6
WSW	0	2	1	0	0	0	3
W	0	0	0	0	0	0	0
WNW	0	1	0	0	0	0	1
NW	0	0	0	0	0	0	0
NNW	0	1	0	0	0	0	1
Variable	0	0	0	0	0	0	0
Total	2	19	36	15	8	0	80

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

Quad Cities Nuclear Power Station
2009 Annual Radioactive Effluent Release Report

Solid Waste and Irradiated Fuel Shipments

A. Solid Waste Shipped Offsite for Burial or Disposal (Not irradiated fuel)

1. Types of Waste

Types of Waste	Total Quantity (m^3)	Total Activity (Ci)	Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc	3.45E+01	1.55E+02	2009	2.50E+01
b. Dry compressible waste, contaminated equip, etc	1.33E+03	8.44E+00	2009	2.50E+01
c. Irradiated components, control rods, etc	N/A	N/A	N/A	N/A
d. Other (describe) Combined Packages of a. and b.	N/A	N/A	N/A	N/A

2. Estimate of major nuclide composition (by waste type)

Major Nuclide Composition		%
a.	Co-60	6.36E+01
	Fe-55	2.04E+01
	Cs-137	1.06E+01
	Zn-65	2.62E+00
	Ni-63	1.30E+00
b.	Mn-54	1.25E+00
	Fe-55	3.09E+01
	Co-60	6.37E+01
	Zn-65	6.06E-01
	Cs-137	2.21E+00
c.	N/A	N/A
d.	N/A	N/A

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
25	Highway	Processor
7	Highway	Disposal

B. Irradiated Fuel Shipments (disposition)

Number of Shipments	Mode of Transportation	Destination
N/A	Highway	Disposal

C. Changes to the Process Control Program

See Attachment 2.

Attachment 2

RW-AA-100, Revision 7, Process Control Program for Radioactive Wastes

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

Attachment 3

CY-QC-170-301, Revision 9, Off-Site Dose Calculation Manual

ODCM Change Summary
Page 1 of 3

Item No.	(Old) Rev. 8 page No.	(New) Rev. 9 page No.	Description of Change	Reason for Change
1	50	50	Added RSR 12.2.2 (changed the numbering sequence of the following RSR's) to perform a CHANNEL CHECK weekly on the Main Chimney and Rector Vent particulate and iodine samplers.	To align with NUREG 1302 requirements. Per Table 4.3-9 of NUREG 1302, a CHANNEL CHECK is to be performed on the prescribed instrumentation (Main Chimney and Reactor Vent particulate and iodine samplers) at a frequency of once per week. As defined in the ODCM (Section 1.0), a CHANNEL CHECK shall be the qualitative assessment, by observation, of channel behavior during operation.
2	51	51	Added RSR 12.2.2 to Table 12.2.2-1 under Main Chimney and Reactor Vent iodine and particulate sampler. Re-numbered the other RSR's to agree with those located on pg 50.	To align Table 12.2.2-1 with appropriate surveillance requirements outlined on pg 50.
3	82	82	Changed the total number of radioiodine and particulate sample stations from eight to nine in Table 12.6.1-1.	See Change Item No. 17. Due to the addition of Q-41, there are a total of nine radioiodine and particulate sample stations.
4	82	82	Changed the total number of far field indicators from three to four in Table 12.6.1-1.	See Change Item No. 17. Due to the addition of Q-41, there are a total of four far field radioiodine and particulate sampling stations.
5	85	85	Added a control location for sediment samples.	See Change Item No. 19. Due to the addition of Q-40, there is now a sediment control. The previous revision does not include the verbiage of having a control.
6	99	99	Change reference in Paragraph 12.7.3.4 from Section 12.7.4 to Section 12.7.5.	Section 12.7.4 is 'Off site Dose Calculation Manual (ODCM)' and not 'Major Changes to Radioactive Waste Treatment Systems (Liquids and Gaseous).' The Section was changed to reference the intended section of 12.7.5.
7	216	216	Updated Table 4-2, 'Average Wind Speeds' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by an NRC approved software and was verified by site personnel.
8	217	217	Updated Table 4-3, 'Maximum Offsite Gamma-χ/Q' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by site personnel and verified by an industry expert.
9	218	218	Updated Table 4-4, 'χ/Q and D/Q Maxima at or Beyond the UNRESTRICTED AREA Boundary' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by an NRC approved software and was verified by site personnel.

Item No.	(Old) Rev. 8 page No.	(New) Rev. 9 page No.	Description of Change	Reason for Change
10	219	219	Updated Table 4-5, 'χ/Q and D/Q Maxima at or Beyond the RESTRICTED AREA Boundary' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by an NRC approved software and was verified by site personnel.
11	220-234	220-233	Updated Table 4-6 (for nuclides Kr-83m, Kr-85m, Kr-85, Kr-87, Kr-88, Kr-89, Xe-131m, Xe-133m, Xe-133, Xe-135m, Xe-135, Xe-137, Xe-138, and Ar-41) with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. Removed Kr-90 in Table 4-6, due to nuclide not being present in the 10-Year meteorological data. This data was generated by an NRC approved software and by site personnel. An industry expert then verified the data.
12	236-237	235-236	Updated Table 4-8, 'Mixed (changed to Elevated) Mode Joint Frequency Distribution Table Summary 296 Foot Elevation Data' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by an NRC approved software and verified by site personnel.
13	238-239	237-238	Updated Table 4-9, 'Mixed Mode Joint Frequency Distribution Table Summary 196 Foot Elevation Data' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by an NRC approved software and verified by site personnel.
14	240-241	N/A	Deleted Table 4-10, 'Mixed Mode Joint Frequency Distribution Table Summary 33 Foot Elevation Data.'	Combined this table with Table 4-9 to reflect actual 'Mixed' mode data from the 196 foot elevation and not a combination of data from the 'Mixed' mode (196 foot elevation) and 'Ground' mode (33 foot elevation).
15	242-243	239-240	Updated Table 4-11 (Table 4-10 in Rev 9), 'Ground Mode Joint Frequency Distribution Table Summary 33 Foot Elevation Data' with current 10-year meteorological data (January 1998 through December 2007).	To reflect current meteorological conditions. This data was generated by an NRC approved software and was verified by site personnel.
16	244-286	242-284	Updated table numbers to incorporate the deletion of Table 4-10.	Due to the deletion of Table 4-10, the proceeding table(s) needed to be updated numerically. A search was performed on each of the table numbers throughout the ODCM to ensure correct references were made (updated) elsewhere.
17	N/A	296	Added Q-41 to the list of far field indicators for radioiodine and particulate sampling in Table 6-1 (Page 1 of 7).	After reviewing the current 10-meteorological data a far field indicator site was needed in the NNE sector. Placed Q-41 in this sector.

Item No.	(Old) Rev. 8 page No.	(New) Rev. 9 page No.	Description of Change	Reason for Change
18	299	297	Edited TLD Q-116-3 to reflect the NNW sector and not N sector in Table 6-1 (Page 2 of 7).	The actual location of this TLD is in the NNW sector. This was an editorial error from a prior revision.
19	N/A	299	Added Q-40 as a new sediment control location.	For trending purposes.
20	306	303	Updated Figure 6-2 'REMP Sample Locations – 9.3-Mile Radius' with new sampling locations Q-40 and Q-41.	Both Q-40 (added as a sediment control location) and Q-41 (added as a far field indicator site) were added to Figure 6-2 to reflect the geographic position of each.

Attachment 4

Errata/Correction to the 2007 Annual Radioactive Effluent Release Report

Errata/Correction to the 2007 ARERR

The following list identifies each piece of errata data that has been identified within the previous year. The following pages reflect the affected original submitted page and the edited page. The edited page contains revision bars to track the changes. At the top of each page, the year of the appropriate report is outlined.

Errata data from 2007 ARERR:

1. During the review of the 2007 Radiological Effluent Release Report, it was identified that the report contained incorrect data for total quantity and total activity of solid waste shipped offsite for disposal in Section A.1.a.: spent resins, filter sludges, evaporator bottoms, etc. The reported values were in the conservative direction (i.e., over reported the actual quantity and activity levels). Issue Report 941757 was originated to capture the deficiency and to provide a tracking mechanism to correct the data from the 2007 Radiological Effluent Release Report.
   - Total Quantity (cubic meters):
     1.22E+03 reported value 1.06E+02 corrected value
   - Total Activity (Curies):
     7.75E+04 reported value 9.66E+02 corrected value

Quad Cities Nuclear Power Station
2007 Annual Radioactive Effluent Release Report

Solid Waste and Irradiated Fuel Shipments

A. Solid Waste shipped Offsite for Burial or Disposal (Not irradiated fuel)

1. Types of Waste

Types of Waste	Total Quantity (m^3)	Total Activity (Ci)	Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc	1.22E+03	7.75E+04	2007	2.50E+01
b. Dry compressed waste, contaminated equip, etc	1.41E+04	4.17E+02	2007	2.50E+01
c. Irradiated components, control rods, etc	5.70E+00	1.45E+05	2007	2.50E+01
d. Other (RWCU Powdex Resin)	1.11E+02	1.76E+03	2007	2.50E+01

2. Estimate of major nuclides composition (by waste type)

	Major Nuclide Composition	%
a.	Fe-55	4.64E+01
	Co-60	4.59E+01
	Mn-54	3.83E+00
b.	Co-60	3.99E+01
	Fe-55	3.75E+01
	Zn-65	8.80E+00
c.	Co-60	5.09E+01
	Fe-55	3.94E+01
	Ni-63	3.42E+00
d.	Co-60	4.41E+01
	Fe-55	3.76E+01
	Mn-54	6.12E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
38	Highway	Processor
17	Highway	Disposal

B. Irradiated Fuel Shipments (disposition)

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

C. Changes to the Process Control Program

None

Quad Cities Nuclear Power Station
2007 Annual Radioactive Effluent Release Report

Solid Waste and Irradiated Fuel Shipments

A. Solid Waste shipped Offsite for Burial or Disposal (Not irradiated fuel)

1. Types of Waste

Types of Waste	Total Quantity (m^3)	Total Activity (Ci)	Period	Est. Total Error %
a. Spent resins, filter sludges, evaporator bottoms, etc	1.06E+02	9.66E+02	2007	2.50E+01
b. Dry compressed waste, contaminated equip, etc	1.41E+04	4.17E+02	2007	2.50E+01
c. Irradiated components, control rods, etc	5.70E+00	1.45E+05	2007	2.50E+01
d. Other (RWCU Powdex Resin)	1.11E+02	1.76E+03	2007	2.50E+01

2. Estimate of major nuclides composition (by waste type)

Major Nuclide Composition	%
a. Fe-55	4.64E+01
Co-60	4.59E+01
Mn-54	3.83E+00
b. Co-60	3.99E+01
Fe-55	3.75E+01
Zn-65	8.80E+00
c. Co-60	5.09E+01
Fe-55	3.94E+01
Ni-63	3.42E+00
d. Co-60	4.41E+01
Fe-55	3.76E+01
Mn-54	6.12E+00

3. Solid Waste Disposition

Number of Shipments	Mode of Transportation	Destination
38	Highway	Processor
17	Highway	Disposal

B. Irradiated Fuel Shipments (disposition)

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

C. Changes to the Process Control Program

None