

**ZION NUCLEAR POWER STATION
2002 RADIOACTIVE EFFLUENT RELEASE REPORT
UNIT 1 & 2 (DOCKET Numbers 50-295 & 50-304)**

EXECUTIVE SUMMARY

A review of 2002 effluent data versus previous years' data showed there were no abnormally high amounts of radioactivity released during 2002. In 2002, there was no radioactive iodine released. The release of noble gas and particulates continued to trend downward. This trend can be attributed to the shutdown of both units. During the year the unit 1 discharge vent was mechanically closed.

Airborne

	Yearly Dose Limit per Reactor Unit	Dose to Maximally Exposed Receptor (Infant) from Unit 1	Dose to Maximally Exposed Receptor (Adult) from Unit 2
Gamma Air	10 mrad	0 mrad	0 mrad
Beta Air	20 mrad	0 mrad	0 mrad
Total Body	5 mrad	4.62E-3mrem	9.24e-4 mrem
Skin	15 mrad	0 mrem	0 mrem
Organ	15 mrad	8.29e-3 mrem	3.21e-3 mrem

Aquatic doses were low because both units are no longer operational. Aquatic doses for Unit 1 were higher than the doses for Unit 2 because there are no discharges of radioactive effluents performed using the Unit 2 Discharge Canal. All liquid releases are performed using the Unit 1 Discharge Canal.

Aquatic

	Yearly Dose Limit per Reactor Unit	Dose to Maximally Exposed Receptor (Adult) from Unit 1	Dose to Maximally Exposed Receptor from Unit 2
Total Body	3 mrem	3.06e-2 mrem	0 mrem
Organ	10 mrem	4.84e-2 mrem	0 mrem

The doses to the public, from all Zion Station effluent paths during 2002, were extremely low and far below all regulatory limits.

**ZION STATION
Unit 1
10CFR20 Compliance Assessment**

1. 10CFR 20.1301 (a) (1) Compliance

Total Effective Dose Equivalent,	<u>mrem/year</u>	<u>4.84e-2</u>
10 CFR 20.1301 (a) (1) limit	<u>mrem/yr</u>	<u>100</u>
% of the limit		<u>0.05</u>

2. Compliance Summary 10CFR20

	1 st Qtr.	2 nd Qtr.	3 rd Qtr.	4 th Qtr	% of Limit
TEDE	6.49e-4	1.42e-2	3.1e-2	2.58e-3	0.05%

**ZION STATION
Unit 2
10CFR20 Compliance Assessment**

1. 10CFR 20.1301 (a) (1) Compliance

Total Effective Dose Equivalent,	<u>mrem/year</u>	3.21e-3
10 CFR 20.1301 (a) (1) limit	<u>mrem/yr</u>	100
% of the limit		<u>0.00</u>

2. Compliance Summary 10CFR20

	1 st Qtr.	2 nd Qtr.	3 rd Qtr.	4 th Qtr	% of Limit
TEDE	1.63e-3	1.37e-3	5.15e-6	2.33e-4	0.00%

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 1 (Docket Number 50-295)

INFANT RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	6.72E-04	1.02E-03	4.32E-06	0.00E+00
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	3.60E-03	4.69E-03	4.30E-06	0.00E+00
Critical Organ		Liver	Liver	Liver	Na

Yearly Limit 10CFR50 Appendix I	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
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10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	1.70E-03	0.03%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	8.29E-03	0.06%
	Lung	

B. Aquatic

Total Body	1.5 mrem	1.70E-07	1.25E-05	3.86E-06	2.93E-07
Internal Organ	5.0 mrem	8.09E-07	1.72E-05	3.69E-05	3.05E-06
Critical Organ		Liver	Liver	Liver	Liver

3.0 mrem	1.68E-05	0.00%
10.0 mrem	5.80E-05	0.00%
	Liver	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 1 (Docket Number 50-295)

CHILD RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	7.45E-04	1.12E-03	4.53E-06	0.00E+00
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	2.46E-03	3.27E-03	4.76E-06	0.00E+00
Critical Organ		Bone	Bone	GI-LI	Na

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	1.87E-03	0.04%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	5.73E-03	0.04%
	Bone	

B. Aquatic

Total Body	1.5 mrem	9.00E-05	1.93E-03	4.20E-03	3.48E-04
Internal Organ	5.0 mrem	6.06E-04	1.33E-02	2.91E-02	2.42E-03
Critical Organ		Bone	Bone	Bone	Bone

3.0 mrem	6.57E-03	0.22%
10.0 mrem	4.54E-02	0.45%
	Bone	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 1 (Docket Number 50-295)

TEENAGE RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	8.45E-04	1.24E-03	4.41E-06	0.00E+00
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	1.57E-03	2.15E-03	5.06E-06	0.00E+00
Critical Organ		Liver	Liver	GI-Li	Na

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	2.09E-03	0.04%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	3.73E-03	0.02%
	Liver	

B. Aquatic

Total Body	1.5 mrem	2.30E-04	4.99E-03	1.90E-02	3.00E-06
Internal Organ	5.0 mrem	6.49E-04	1.42E-02	3.10E-02	2.58E-03
Critical Organ		Liver	Liver	Liver	Liver

3.0 mrem	2.42E-02	0.81%
10.0 mrem	4.84E-02	0.48%
	Liver	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 1 (Docket Number 50-295)

ADULT RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	8.84E-04	1.28E-03	4.38E-06	0.00E+00
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	1.11E-03	1.56E-03	5.15E-06	0.00E+00
Critical Organ		Liver	Liver	GI-Li	Lung

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	2.17E-03	0.04%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	2.68E-03	0.02%
	Lung	

B. Aquatic

Total Body	1.5 mrem	4.13E-04	8.98E-03	1.96E-02	1.63E-03
Internal Organ	5.0 mrem	6.23E-04	1.36E-02	2.98E-02	2.47E-03
Critical Organ		Liver	Liver	Liver	Liver

3.0 mrem	3.06E-02	1.02%
10.0 mrem	4.65E-02	0.47%
	Liver	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 2 (Docket Number 50-304)

INFANT RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	3.33E-04	2.11E-04	4.32E-06	1.96E-04
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	1.63E-03	1.37E-03	4.47E-06	2.03E-04
Critical Organ		Liver	Liver	Lung	Lung

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	7.44E-04	0.01%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	3.21E-03	0.02%
	Lung	

B. Aquatic

Total Body	1.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Internal Organ	5.0 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Critical Organ		N/A	N/A	N/A	N/A

3.0 mrem	0.00E+00	0.00%
10.0 mrem	0.00E+00	0.00%
	N/A	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 2 (Docket Number 50-304)

CHILD RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	3.67E-04	2.37E-04	4.53E-06	2.06E-04
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	1.13E-03	9.19E-04	4.76E-06	2.16E-04
Critical Organ		Bone	Bone	GI-Lli	GI-Lli

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	8.15E-04	0.02%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	2.27E-03	0.02%
	GI-Lli	

B. Aquatic

Total Body	1.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Internal Organ	5.0 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Critical Organ		N/A	N/A	N/A	N/A

3.0 mrem	0.00E+00	0.00%
10.0 mrem	0.00E+00	0.00%
	N/A	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 2 (Docket Number 50-304)

TEENAGE RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	4.10E-04	2.78E-04	4.41E-06	2.00E-04
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	7.32E-04	5.66E-04	5.06E-06	2.30E-04
Critical Organ		Liver	Liver	GI-Li	GI-Li

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	8.92E-04	0.02%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	1.53E-03	0.01%
	GI-Li	

B. Aquatic

Total Body	1.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Internal Organ	5.0 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Critical Organ		N/A	N/A	N/A	N/A

3.0 mrem	0.00E+00	0.00%
10.0 mrem	0.00E+00	0.00%
	N/A	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

**ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
DOSE TO PUBLIC
UNIT 2 (Docket Number 50-304)**

ADULT RECEPTOR

Maximum Quarterly Dose (mrad, mrem)				
Qtrly Obj	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr

Yearly Limit	Maximum Annual Dose (mrad, mrem)	% of Yearly Dose Limit
10CFR50 Appendix I		

A. Airborne

Gamma Air	5.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Beta Air	10.0 mrad	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Total Body	2.5 mrem	4.27E-04	2.94E-04	4.38E-06	1.99E-04
Skin	7.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Organ	7.5 mrem	5.26E-04	3.83E-04	5.15E-06	2.33E-04
Critical Organ		Liver	Liver	GI-Li	GI-Li

10.0 mrad	0.00E+00	0.00%
20.0 mrad	0.00E+00	0.00%
5.0 mrem	9.24E-04	0.02%
15.0 mrem	0.00E+00	0.00%
15.0 mrem	1.15E-03	0.01%
	GI-Li	

B. Aquatic

Total Body	1.5 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Internal Organ	5.0 mrem	0.00E+00	0.00E+00	0.00E+00	0.00E+00
Critical Organ		N/A	N/A	N/A	N/A

3.0 mrem	0.00E+00	0.00%
10.0 mrem	0.00E+00	0.00%
	N/A	

Total body doses to individuals and populations in unrestricted areas from direct radiation from Zion Station are judged to be negligible in comparison with 10CFR20 annual limit of 100 mrem TEDE and 40CFR190 annual limits of 25 mrem DDE whole body, 75 mrem CDE thyroid, and 25 mrem CDE other organs.

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== I&P DOSE LIMIT ANALYSIS ===== QUARTER 1 =====

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 1 - Admin. Any Organ	INFANT	LIVER	5.39E-03	5.63E+00	9.58E-02
Qtr 1 - Admin. Total Body	ADULT	TBODY	1.34E-03	5.25E+00	2.56E-02

Qtr 1 - T.Spc. Any Organ INFANT LIVER 5.39E-03 7.50E+00 7.19E-02
 Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA

Critical Pathway: Grs/Goat/Milk (GMILK)
 Major Contributors (0% or greater to total)

Nuclide	Percentage
CO-60	6.49E+00
CS-137	9.35E+01

Qtr 1 - T.Spc. Total Body ADULT TBODY 1.34E-03 7.50E+00 1.79E-02

Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA

Critical Pathway: Ground Plane Deposition (GPD)
 Major Contributors (0% or greater to total)

Nuclide	Percentage
CO-60	2.65E+01
CS-137	7.35E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== NG DOSE LIMIT ANALYSIS ===== QUARTER 1 =====

Quartr - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
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Qtr 1 - Admin. Gamma	0.00E+00	7.50E+00	0.00E+00
Qtr 1 - Admin. Beta	0.00E+00	7.50E+00	0.00E+00
Qtr 1 - T.Spc. Gamma	0.00E+00	7.50E+00	0.00E+00
Receptor: 5 Composite Crit. Receptor - IP			
Distance: 0.00 (meters)			Compass Point: NA
Nuclide Percentage			

Qtr 1 - T.Spc. Beta	0.00E+00	7.50E+00	0.00E+00
Receptor: 5 Composite Crit. Receptor - IP			
Distance: 0.00 (meters)			Compass Point: NA
Nuclide Percentage			

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== I&P DOSE LIMIT ANALYSIS ===== QUARTER 2 =====

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 2 - Admin. Any Organ	INFANT	LIVER	6.06E-03	5.63E+00	1.08E-01
Qtr 2 - Admin. Total Body	ADULT	TBODY	1.58E-03	5.25E+00	3.00E-02

Qtr 2 - T.Spc. Any Organ INFANT LIVER 6.06E-03 7.50E+00 8.08E-02

Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA

Critical Pathway: Grs/Goat/Milk (GMILK)
 Major Contributors (0% or greater to total)

Nuclide	Percentage
CO-60	7.84E+00
CS-137	9.22E+01

Qtr 2 - T.Spc. Total Body ADULT TBODY 1.58E-03 7.50E+00 2.10E-02

Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA

Critical Pathway: Ground Plane Deposition (GPD)
 Major Contributors (0% or greater to total)

Nuclide	Percentage
CO-60	3.07E+01
CS-137	6.93E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== NG DOSE LIMIT ANALYSIS =====		===== QUARTER 2 =====		
Quartr - Limit		Dose (mrad)	Limit (mrad)	Max % of Limit
Qtr 2 - Admin. Gamma		0.00E+00	7.50E+00	0.00E+00
Qtr 2 - Admin. Beta		0.00E+00	7.50E+00	0.00E+00
Qtr 2 - T.Spc. Gamma		0.00E+00	7.50E+00	0.00E+00
Receptor: 5	Composite Crit. Receptor - IP			
Distance:	0.00 (meters)			Compass Point: NA
Nuclide	Percentage			
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Qtr 2 - T.Spc. Beta		0.00E+00	7.50E+00	0.00E+00
Receptor: 5	Composite Crit. Receptor - IP			
Distance:	0.00 (meters)			Compass Point: NA
Nuclide	Percentage			
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40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== I&P DOSE LIMIT ANALYSIS ===== QUARTER 3 =====

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 3 - Admin. Any Organ	ADULT	GILLI	1.03E-05	5.63E+00	1.83E-04
Qtr 3 - Admin. Total Body	CHILD	TBODY	9.07E-06	5.25E+00	1.73E-04

Qtr 3 - T.Spc. Any Organ ADULT GILLI 1.03E-05 7.50E+00 1.37E-04
 Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA
 Critical Pathway: Ground Plane Deposition (GPD)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

 CO-60 1.00E+02

Qtr 3 - T.Spc. Total Body CHILD TBODY 9.07E-06 7.50E+00 1.21E-04
 Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA
 Critical Pathway: Ground Plane Deposition (GPD)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

 CO-60 1.00E+02

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

=== NG DOSE LIMIT ANALYSIS ===== QUARTER 3 =====

Quartr - Limit	Dose (mrad)	Limit (mrad)	Max % of Limit
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Qtr 3 - Admin. Gamma	0.00E+00	7.50E+00	0.00E+00
Qtr 3 - Admin. Beta	0.00E+00	7.50E+00	0.00E+00

Qtr 3 - T.Spc. Gamma	0.00E+00	7.50E+00	0.00E+00
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Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA

Nuclide Percentage

Qtr 3 - T.Spc. Beta	0.00E+00	7.50E+00	0.00E+00
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Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA

Nuclide Percentage

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== I&P DOSE LIMIT ANALYSIS === QUARTER 4 ===

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 4 - Admin. Any Organ	ADULT	GILLI	2.33E-04	5.63E+00	4.15E-03
Qtr 4 - Admin. Total Body	CHILD	TBODY	2.06E-04	5.25E+00	3.92E-03

Qtr 4 - T.Spc. Any Organ ADULT GILLI 2.33E-04 7.50E+00 3.11E-03
 Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA
 Critical Pathway: Ground Plane Deposition (GPD)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

 CO-60 1.00E+02

Qtr 4 - T.Spc. Total Body CHILD TBODY 2.06E-04 7.50E+00 2.74E-03
 Receptor: 5 Composite Crit. Receptor - IP
 Distance: 0.00 (meters) Compass Point: NA
 Critical Pathway: Ground Plane Deposition (GPD)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

 CO-60 1.00E+02

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

=== NG DOSE LIMIT ANALYSIS =====		===== QUARTER 4 =====		
Quartr - Limit		Dose (mrad)	Limit (mrad)	Max % of Limit
Qtr 4 - Admin. Gamma		0.00E+00	7.50E+00	0.00E+00
Qtr 4 - Admin. Beta		0.00E+00	7.50E+00	0.00E+00
Qtr 4 - T.Spc. Gamma		0.00E+00	7.50E+00	0.00E+00
Receptor: 5	Composite Crit. Receptor - IP			
Distance:	0.00 (meters)			Compass Point: NA
Nuclide	Percentage			
-----	-----			
Qtr 4 - T.Spc. Beta		0.00E+00	7.50E+00	0.00E+00
Receptor: 5	Composite Crit. Receptor - IP			
Distance:	0.00 (meters)			Compass Point: NA
Nuclide	Percentage			
-----	-----			

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

GASEOUS DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

=== I&P DOSE LIMIT ANALYSIS ===== ANNUAL 2002 =====

Annual - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
2002 - Admin. Any Organ	INFANT	LIVER	1.17E-02	1.13E+01	1.04E-01
2002 - Admin. Total Body	ADULT	TBODY	3.13E-03	1.05E+01	2.98E-02

2002 - T.Spc. Any Organ INFANT LIVER 1.17E-02 1.50E+01 7.77E-02

Receptor: 5 Composite Crit. Receptor - IP

Distance: 0.00 (meters) Compass Point: NA

Critical Pathway: Grs/Goat/Milk (GMILK)

Major Contributors (0% or greater to total)

Nuclide Percentage

CO-60 8.82E+00

CS-137 9.12E+01

2002 - T.Spc. Total Body ADULT TBODY 3.13E-03 1.50E+01 2.09E-02

Receptor: 5 Composite Crit. Receptor - IP

Distance: 0.00 (meters) Compass Point: NA

Critical Pathway: Ground Plane Deposition (GPD)

Major Contributors (0% or greater to total)

Nuclide Percentage

CO-60 3.35E+01

CS-137 6.65E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

 GASEOUS DOSE SUMMARY

Report for: 2002
 Unit Range - From: 0 To: 2

--- NG DOSE LIMIT ANALYSIS -----		ANNUAL 2002 -----		
Annual - Limit		Dose (mrad)	Limit (mrad)	Max % of Limit
2002	- Admin. Gamma	0.00E+00	1.50E+01	0.00E+00
2002	- Admin. Beta	0.00E+00	1.50E+01	0.00E+00
2002	- T.Spc. Gamma	0.00E+00	1.50E+01	0.00E+00
Receptor: 5 Composite Crit. Receptor - IP				
Distance: 0.00 (meters)		Compass Point: NA		
Nuclide Percentage		-----		
2002	- T.Spc. Beta	0.00E+00	1.50E+01	0.00E+00
Receptor: 5 Composite Crit. Receptor - IP				
Distance: 0.00 (meters)		Compass Point: NA		
Nuclide Percentage		-----		

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

Report for: 2002

Unit Range - From: 0 To: 2

=== MAXIMUM DOSE ANALYSIS === ANNUAL 2002 ===

Dose Type	Age Group	Organ	Dose (mrem)
Any Organ	CHILD	BONE	2.86E-02
Liquid Receptor: 0	Liquid Receptor		
Gaseous Receptor: 5	Composite Crit. Receptor - IP		
Distance: 0.00 (meters)	Compass Point: NA		

Liquid Dose: 2.05E-02 % of Total: 7.17E+01
 Critical Pathway: Fresh Water Fish - Sport (FFSP)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

H-3	0.00E+00
CO-60	0.00E+00
SR-90	5.52E-02
CS-134	1.02E+00
CS-137	9.89E+01

Gaseous Dose: 8.09E-03 % of Total: 2.83E+01
 Critical Pathway: Grs/Goat/Milk (GMILK)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

CO-60	1.27E+01
CS-137	8.73E+01

=== MAXIMUM DOSE ANALYSIS === ANNUAL 2002 ===

Dose Type	Age Group	Organ	Dose (mrem)
Total Body	ADULT	TBODY	1.70E-02
Liquid Receptor: 0	Liquid Receptor		
Gaseous Receptor: 5	Composite Crit. Receptor - IP		
Distance: 0.00 (meters)	Compass Point: NA		

Liquid Dose: 1.38E-02 % of Total: 8.14E+01
 Critical Pathway: Fresh Water Fish - Sport (FFSP)
 Major Contributors (0% or greater to total)
 Nuclide Percentage

H-3	1.44E-03
CO-60	2.00E-01
SR-90	1.64E-03
CS-134	2.37E+00

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

Nuclide Percentage

CS-137 9.74E+01

Gaseous Dose: 3.13E-03 % of Total: 1.84E+01

Critical Pathway: Ground Plane Deposition (GPD)

Major Contributors (0% or greater to total)

Nuclide Percentage

CO-60 3.35E+01
CS-137 6.65E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

Liquid Receptor

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	4.50E-04	6.23E-04	6.08E-09	2.11E-04	7.01E-05	3.26E-05	0.00E+00	4.13E-04
TEEN	4.81E-04	6.49E-04	4.47E-09	2.20E-04	8.55E-05	2.34E-05	0.00E+00	2.30E-04
CHILD	6.06E-04	5.87E-04	6.12E-09	1.91E-04	6.86E-05	8.69E-06	0.00E+00	9.00E-05
INFANT	6.42E-07	8.09E-07	4.18E-09	2.07E-07	8.65E-08	1.19E-07	0.00E+00	1.70E-07

=== SITE DOSE LIMIT ANALYSIS === QUARTER 1 ===

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 1 - Admin. Any Organ	TEEN	LIVER	6.49E-04	3.75E+00	1.73E-02
Qtr 1 - Admin. Total Body	ADULT	TBODY	4.13E-04	1.13E+00	3.67E-02

Qtr 1 - T.Spc. Any Organ TEEN LIVER 6.49E-04 5.00E+00 1.30E-02

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	6.89E-04
CO-60	1.69E-01
CS-134	2.54E+00
CS-137	9.73E+01

Qtr 1 - T.Spc. Total Body ADULT TBODY 4.13E-04 1.50E+00 2.75E-02

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.47E-03
CO-60	5.85E-01
CS-134	3.21E+00
CS-137	9.62E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) === QUARTER 2 ===

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	9.90E-03	1.36E-02	1.70E-07	4.62E-03	1.53E-03	4.75E-04	0.00E+00	8.98E-03
TEEN	1.06E-02	1.42E-02	1.25E-07	4.82E-03	1.87E-03	3.48E-04	0.00E+00	4.99E-03
CHILD	1.33E-02	1.28E-02	1.71E-07	4.18E-03	1.50E-03	1.32E-04	0.00E+00	1.93E-03
INFANT	1.53E-05	1.72E-05	1.17E-07	4.57E-06	1.92E-06	1.33E-06	0.00E+00	2.47E-06

=== SITE DOSE LIMIT ANALYSIS === QUARTER 2 ===

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 2 - Admin. Any Organ	TEEN	LIVER	1.42E-02	3.75E+00	3.78E-01
Qtr 2 - Admin. Total Body	ADULT	TBODY	8.98E-03	1.13E+00	7.98E-01

Qtr 2 - T.Spc. Any Organ TEEN LIVER 1.42E-02 5.00E+00 2.84E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	8.79E-04
CO-60	7.91E-02
CS-134	1.69E+00
CS-137	9.82E+01

Qtr 2 - T.Spc. Total Body ADULT TBODY 8.98E-03 1.50E+00 5.98E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.89E-03
CO-60	2.76E-01
SR-90	6.03E-03
CS-134	2.15E+00
CS-137	9.76E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

Agegrp	Liquid Receptor							
	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	2.16E-02	2.98E-02	2.51E-07	1.01E-02	3.36E-03	7.77E-04	0.00E+00	1.96E-02
TEEN	2.31E-02	3.10E-02	1.84E-07	1.05E-02	4.09E-03	5.80E-04	0.00E+00	1.09E-02
CHILD	2.91E-02	2.81E-02	2.52E-07	9.13E-03	3.29E-03	2.25E-04	0.00E+00	4.20E-03
INFANT	3.08E-05	3.69E-05	1.72E-07	9.91E-06	4.11E-06	1.39E-06	0.00E+00	3.86E-06

--- SITE DOSE LIMIT ANALYSIS --- QUARTER 3 ---

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 3 - Admin. Any Organ	TEEN	LIVER	3.10E-02	3.75E+00	8.27E-01
Qtr 3 - Admin. Total Body	ADULT	TBODY	1.96E-02	1.13E+00	1.74E+00

Qtr 3 - T.Spc. Any Organ TEEN LIVER 3.10E-02 5.00E+00 6.20E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	5.94E-04
CO-60	3.46E-02
CS-134	1.87E+00
CS-137	9.81E+01

Qtr 3 - T.Spc. Total Body ADULT TBODY 1.96E-02 1.50E+00 1.31E-00

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.28E-03
CO-60	1.21E-01
CS-134	2.38E+00
CS-137	9.75E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

Liquid Receptor

=== PERIOD DOSE BY ORGAN AND AGE GROUP (mrem) === QUARTER 4 ===

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	1.80E-03	2.47E-03	1.33E-08	8.39E-04	2.79E-04	6.05E-05	0.00E+00	1.63E-03
TEEN	1.92E-03	2.58E-03	9.74E-09	8.75E-04	3.40E-04	4.54E-05	0.00E+00	9.03E-04
CHILD	2.42E-03	2.33E-03	1.33E-08	7.59E-04	2.73E-04	1.77E-05	0.00E+00	3.48E-04
INFANT	2.56E-06	3.05E-06	9.11E-09	8.18E-07	3.37E-07	8.81E-08	0.00E+00	2.93E-07

=== SITE DOSE LIMIT ANALYSIS === QUARTER 4 ===

Quartr - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
Qtr 4 - Admin. Any Organ	TEEN	LIVER	2.58E-03	3.75E+00	6.87E-02
Qtr 4 - Admin. Total Body	ADULT	TBODY	1.63E-03	1.13E+00	1.45E-01

Qtr 4 - T.Spc. Any Organ TEEN LIVER 2.58E-03 5.00E+00 5.15E-02

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	3.78E-04
CO-60	2.62E-02
CS-134	1.62E+00
CS-137	9.84E+01

Qtr 4 - T.Spc. Total Body ADULT TBODY 1.63E-03 1.50E+00 1.09E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	8.14E-04
CO-60	9.16E-02
CS-134	2.07E+00
CS-137	9.78E+01

40CFR190 URANIUM FUEL CYCLE DOSE REPORT

LIQUID DOSE SUMMARY

Report for: 2002

Unit Range - From: 0 To: 2

Liquid Receptor

Agegrp	Bone	Liver	Thyroid	Kidney	Lung	GI-LLI	Skin	TB
ADULT	1.52E-02	2.10E-02	1.99E-07	7.12E-03	2.37E-03	6.41E-04	0.00E+00	1.38E-02
TEEN	1.63E-02	2.19E-02	1.46E-07	7.42E-03	2.88E-03	4.74E-04	0.00E+00	7.68E-03
CHILD	2.05E-02	1.98E-02	2.00E-07	6.44E-03	2.32E-03	1.81E-04	0.00E+00	2.97E-03
INFANT	2.22E-05	2.63E-05	1.37E-07	7.00E-06	2.91E-06	1.51E-06	0.00E+00	3.25E-06

=== SITE DOSE LIMIT ANALYSIS === ANNUAL 2002 ===

Annual - Limit	Age Group	Organ	Dose (mrem)	Limit (mrem)	Max % of Limit
2002 - Admin. Any Organ	TEEN	LIVER	2.19E-02	7.50E+00	2.91E-01
2002 - Admin. Total Body	ADULT	TBODY	1.38E-02	2.25E+00	6.15E-01

2002 - T.Spc. Any Organ TEEN LIVER 2.19E-02 1.00E+01 2.19E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	6.69E-04
CO-60	5.74E-02
CS-134	1.86E+00
CS-137	9.81E+01

2002 - T.Spc. Total Body ADULT TBODY 1.38E-02 3.00E+00 4.61E-01

Critical Pathway: Fresh Water Fish - Sport (FFSP)

Major Contributors (0% or greater to total)

Nuclide	Percentage
H-3	1.44E-03
CO-60	2.00E-01
SR-90	1.64E-03
CS-134	2.37E+00
CS-137	9.74E+01

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
 UNIT 1 & 2 (Docket # 50-295 & 50-304)
 SUMMARY OF GASEOUS RELEASES

Units	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
A. Fission and Activation Gases															
1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	uCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
B. Iodine															
1. Total I-131 Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	uCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
C. Particulates (half-life > 8 days)															
1. Total Release Activity	Ci	6.52E-06	2.96E-05	7.49E-05	1.11E-04	9.68E-05	1.03E-04	<LLD	2.00E-04	<LLD	1.93E-06	1.99E-06	4.35E-05	<LLD	3.56E-04
2. Average Release Rate	uCi/sec	2.43E-08	1.14E-05	2.80E-05	1.43E-06	3.73E-05	3.85E-05	<LLD	2.64E-06	<LLD	7.45E-07	2.43E-08	1.62E-05	<LLD	1.43E-06
3. Gross Alpha Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
D. Tritium															
1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	uCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
E. Sum of Iodine, Particulate (half-lives > 8 days), and Tritium Releases.															
1. Total Release Activity	Ci	6.52E-06	2.96E-05	7.49E-05	1.11E-04	9.68E-05	1.03E-04	0.00E+00	2.00E-04	0.00E+00	1.93E-06	1.99E-06	4.35E-05	0.00E+00	3.56E-04

‡ Gross Alpha, Sr-89, and Sr-90 Activities are quantified by quarterly composite analyses. The difference between the quarterly Particulates total and the sum of the totals of the three corresponding months equals the total quarterly activities of Sr-89 and Sr-90. The cells for monthly activity values of Gross Alpha on this page and Sr-89 and Sr-90 on the Batch and Continuous Mode data sheets are blank because monthly values are not applicable.

Lower limit of detection (LLD) values are presented in the Gaseous Effluents LLD Values for Gaseous Releases section. The abbreviation "<LLD" indicates the activity concentration of the radionuclide for each individual sample analyzed during the applicable period was less than the LLD value for that nuclide. If the abbreviation "<LLD" is listed for a group of radionuclides, the activity concentration of each radionuclide for each sample during the period was less than the LLD value for the respective radionuclide.

Percent of technical specification limit information is presented in the Gaseous Effluents Supplemental Information and Dose to Public sections of this report. The abbreviation "No Ref" indicates that no batch releases were performed during the applicable period.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
UNIT 1 & 2 (Docket No. 18 50-295 & 50-304)
BATCH MODE

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
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A. Fission and Activation Gases

Ar-41	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Kr-85	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Kr-85m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Kr-87	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Kr-88	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-131	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-131m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-133	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-133m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-135	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-135m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Xe-138	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel

B. Iodines

Br-82	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
I-131	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
I-132	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
I-133	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
I-134	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
I-135	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel

C. Particulates

Nb-24	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cr-51*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Mn-54*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Co-57*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Co-58*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Co-60*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Zn-65*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Se-75*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Rb-88	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Sr-89*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Sr-90*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Zr-95*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Nb-95*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Mo-99	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Tc-99m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ru-103*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ag-110m*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cd-134*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cs-136*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cs-137*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cs-138	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ba-140*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ls-140	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ce-144*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Pr-144	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
W-187	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel

D. Tritium

T. Total Release Activity	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
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* Particulate isotopes with half-life greater than 8 days

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
A. Fission and Activation Gases																	
Ar-41	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
B. Iodines																	
Br-82	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-131	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-132	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-133	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-134	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
C. Particulates																	
Nb-24	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cr-51*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60*	3.20E-08	<LLD	7.48E-06	1.07E-05	7.09E-07	5.70E-08	<LLD	8.41E-08	<LLD	<LLD	1.93E-07	1.93E-07	4.39E-08	<LLD	<LLD	4.39E-08	2.17E-05
Zr-65*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Se-75*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Rb-86	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Te-99m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ru-103*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-137*	3.45E-05	2.96E-06	<LLD	3.78E-05	8.96E-08	4.80E-05	<LLD	8.50E-05	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	9.25E-05
Cs-138	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
La-140	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Pr-144	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
W-187	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
D. Tritium																	
f. Total Release Activity	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

* Particulate isotope with half-life greater than 8 days

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
 UNIT 1 (Docket # 50-295)
 SUMMATION OF ALL RELEASES

Units	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
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A. Fission and Activation Gases

	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
1. Total Release Activity	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

B. Iodine

	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
1. Total I-131 Activity	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

C. Particulates (half-lives > 8 days)

	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
1. Total Release Activity ‡	2.96E-06	2.96E-06	4.86E-06	1.08E-05	6.11E-06	5.70E-06	0.00E+00	1.18E-05	<LLD	9.85E-08	9.85E-08	<LLD	<LLD	<LLD	<LLD	2.27E-05
2. Average Release Rate	1.11E-06	1.22E-06	1.81E-06	1.39E-07	2.38E-06	2.13E-06	0.00E+00	1.50E-07	<LLD	3.72E-08	1.21E-09	<LLD	<LLD	<LLD	<LLD	7.20E-06
3. Gross Alpha Activity ‡				<LLD				<LLD			<LLD				<LLD	<LLD

D. Tritium

	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
1. Total Release Activity	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

E. Sum of Iodine, Particulate (half-lives > 8 days), and Tritium Releases.

	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
1. Total Release Activity	2.96E-06	2.96E-06	4.86E-06	1.08E-05	6.11E-06	5.70E-06	0.00E+00	1.18E-05	0.00E+00	9.85E-08	9.85E-08	0.00E+00	0.00E+00	0.00E+00	0.00E+00	2.27E-05

‡ Gross Alpha, Sr-89, and Sr-90 Activities are quantified by quarterly composite analyses. The difference between the quarterly Particulates total and the sum of the totals of the three corresponding months equals the total quarterly activities of Sr-89 and Sr-90. The cells for monthly activity values of Gross Alpha on this page and Sr-89 and Sr-90 on the Batch and Continuous Mode data sheets are blank because monthly values are not applicable.

Lower limit of detection (LLD) values are presented in the Gaseous Effluents LLD Values for Gaseous Releases section. The abbreviation "<LLD" indicates the activity concentration of the radionuclide for each individual sample analyzed during the applicable period was less than the LLD value for that nuclide. If the abbreviation "<LLD" is listed for a group of radionuclides, the activity concentration of each radionuclide for each sample during the period was less than the LLD value for the respective radionuclide.

Percent of technical specification limit information is presented in the Gaseous Effluents Supplemental Information and Dose to Public sections of this report. The abbreviation "No Ref" indicates that no batch releases were performed during the applicable period.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
 UNIT 1 (Dock # 50-295)
 BATC
 DE

Units	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
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A. Fission and Activation Gases

Ar-41	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-85	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-85m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-87	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-88	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-131	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-131m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-133	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-133m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-135	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-135m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-138	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD

B. Iodines

Br-82	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-131	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-132	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-133	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-134	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-135	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD

C. Particulates

Na-24	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cr-51*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Mn-54*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Co-57*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Co-58*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Co-60*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Zn-65*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Se-75*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Rb-88	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Sr-89*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Sr-90*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Zr-95*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Nb-95*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Mo-99	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Tc-99m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ru-103*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ag-110m*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cs-134*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cs-137*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Cs-138	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ba-140*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
La-140	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Ce-144*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Pr-144	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
Vl-167	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel

D. Tritium

T. Total Release Activity	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel
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* Particulate isotope with half-life greater than 8 days

ZION NUCLEAR POWER STATION
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
 UNIT 1 (Docket # NEI 50-295)
 CONTINUOUS MODE

Units	Jan	Feb	Mar	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
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A. Fission and Activation Gases

Ar-41	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

B. Iodines

I-131	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-132	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-133	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-134	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

C. Particulates

Nb-24	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cr-51*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60*	<LLD	<LLD	4.86E-06	<LLD	5.70E-06	<LLD	5.70E-06	<LLD	<LLD	9.85E-08	9.85E-08	<LLD	<LLD	<LLD	<LLD	1.07E-05
Zn-65*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Se-75*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Rb-86	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-89*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Te-99m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ru-103*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-134*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-138*	2.96E-06	<LLD	<LLD	5.92E-06	4.60E-05	<LLD	6.21E-05	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	5.80E-05
Ce-138	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144*	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Pr-144	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
W-187	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

D. Tritium

Total Release Activity	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
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* Particulate isotope with half-life greater than 8 days

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
 UNIT 2 (Docket # 50-304)
 SUMMATION OF GASEOUS RELEASES

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
A. Fission and Activation Gases																	
1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	uCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
B. Iodine																	
1. Total I-131 Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	uCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
C. Particulates (half-lives > 8 days)																	
1. Total Release Activity	Ci	3.20E-06	<LLD	2.62E+05	2.67E+04	3.56E-06	<LLD	<LLD	3.56E-06	<LLD	<LLD	9.65E-08	4.39E-06	<LLD	<LLD	4.39E-06	2.62E+06
2. Average Release Rate	uCi/sec	1.19E-06	<LLD	9.78E+05	3.37E+04	1.37E-06	<LLD	<LLD	4.53E-06	<LLD	<LLD	3.72E-08	1.64E-06	<LLD	<LLD	<LLD	8.31E+03
3. Gross Alpha Activity	Ci			<LLD			<LLD					<LLD				<LLD	<LLD
D. Tritium																	
1. Total Release Activity	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Release Rate	uCi/sec	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
E. Sum of Iodine, Particulate (half-lives > 8 days), and Tritium Releases.																	
1. Total Release Activity	Ci	3.20E-06	0.00E+00	2.62E+05	2.67E+04	3.56E-06	0.00E+00	0.00E+00	3.56E-06	0.00E+00	0.00E+00	9.65E-08	4.39E-06	0.00E+00	0.00E+00	4.39E-06	2.62E+06

‡ Gross Alpha, Sr-89, and Sr-90 Activities are quantified by quarterly composite analyses. The difference between the quarterly Particulates total and the sum of the totals of the three corresponding months equals the total quarterly activities of Sr-89 and Sr-90. The cells for monthly activity values of Gross Alpha on this page and Sr-89 and Sr-90 on the Batch and Continuous Mode data sheets are blank because monthly values are not applicable.

Lower limit of detection (LLD) values are presented in the Gaseous Effluents LLD Values for Gaseous Releases section. The abbreviation "<LLD" indicates the activity concentration of the radionuclide for each individual sample analyzed during the applicable period was less than the LLD value for that nuclide. If the abbreviation "<LLD" is listed for a group of radionuclides, the activity concentration of each radionuclide for each sample during the period was less than the LLD value for the respective radionuclide.

Percent of technical specification limit information is presented in the Gaseous Effluents Supplemental Information and Dose to Public sections of this report. The abbreviation "No Rel" indicates that no batch releases were performed during the applicable period.

ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 GASEOUS EFFLUENTS - ALL PARTICULATES ARE AT GROUND LEVEL
 UNIT 2 (Dock 4) BATCH # 50-304
 JJE

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
A. Fission and Activation Gases																	
Ar-41	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-85	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-85m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-87	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Kr-88	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-131	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-131m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-133	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-133m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-135	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-135m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Xe-138	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
B. Iodines																	
Br-82	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-131	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-132	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-133	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-134	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
I-135	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
C. Particulates																	
Nb-24	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Cr-51*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Mn-54*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Co-57*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Co-58*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Co-60*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Zn-65*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Se-75*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Rb-88	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Sr-89*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Sr-90*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Zr-95*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Nb-95*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Mo-99	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Tc-99m	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Ru-103*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Ag-110m*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Cs-134*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Cs-136*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Cs-137*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Cs-138	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Ba-140*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Cs-144*	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
Pr-144	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
W-187	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD
D. Tritium																	
1. Total Release Activity	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	No Rel	<LLD

* Particulate isotope with half-life greater than 8 days

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
GASEOUS EFFLUENTS - ALL RELEASES ARE AT GROUND LEVEL
UNIT 2 (Deck 1 or 50-304)
CONTINUOUS MODE

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
Ar-41	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-85m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-87	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Kr-88	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-131m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-133m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-135m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Xe-138	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

A. Fission and Activation Gases

B. Iodines

I-131	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-132	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-133	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-134	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
I-135	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

C. Particulates

Nb-24	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cr-51	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mn-54	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-57	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-58	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Co-60	3.20E-06	<LLD	2.62E-06	3.82E-06	7.08E-07	<LLD	<LLD	7.09E-07	<LLD	9.85E-08	9.85E-08	4.39E-08	<LLD	<LLD	<LLD	4.39E-06	1.10E-05
Zn-65	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Se-75	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Rb-86	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-99	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Sr-90	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Zr-95	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Nb-95	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Mo-99	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Tc-99m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ru-103	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ag-110m	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-134	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-136	3.16E-05	<LLD	<LLD	3.16E-05	2.85E-06	<LLD	<LLD	2.85E-06	<LLD	2.85E-06	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	3.49E-05
Cs-137	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Cs-138	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ba-140	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Lr-140	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Ce-144	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
Pr-144	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
W-187	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

D. Tritium

1. Total Release Activity	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
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* Particulate isotope with half-life greater than 8 days

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)

GASEOUS EFFLUENTS
LOWER LIMIT OF DETECTION (LLD) VALUES FOR GASEOUS RELEASES

<u>Isotope</u>	<u>LLD (uCi/ml)</u>
Alpha	1.00E-11
H-3	1.00E-06
Kr-85	1.00E-06
Mn-54	1.00E-11
Co-58	1.00E-11
Co-60	1.00E-11
Zn-65	1.00E-11
Sr-89	1.00E-11
Sr-90	1.00E-11
Mo-99	1.00E-11
Cs-134	1.00E-11
Cs-137	1.00E-11
Ce-141	1.00E-11
Ce-144	1.00E-11

**ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)**

ADDENDUM

1. Offsite Dose Calculation Manual (ODCM)

Changes to the ODCM are required by Zion Station Permanently Defueled Technical Specification 5.6.1. and ODCM Section 12.6.3 to be submitted as part of, or concurrent with, the Annual Radioactive Effluent Release Report.

A summary of changes made to the ODCM during 2002 and an entire copy of the ODCM, current as of December 31, 2002.

2. Gaseous and Liquid Waste Treatment Systems and Process Control Program

Zion Station ODCM Section 12.6.4 requires major changes to the Gaseous and Liquid Waste Treatment Systems to be reported in the Annual Radioactive Effluent Release Report.

The Waste Gas Hold-up System was permanently vented. In Zion's defueled configuration this system is no longer applicable.

In Zion's defueled configuration, the charcoal iodine removal system is no longer applicable. Due to radioactive decay and no means of production, radioactive iodine is not a concern at Zion.

3. Limiting Conditions of Operation (LCOs)

Zion Station ODCM Section 12.7.2 requires explanation as to why the inoperability of liquid or gaseous monitoring instrumentation was not corrected within the time specified in the ODCM to be submitted with the Annual Radioactive Effluent Release Report.

2LP-084 June 26, 2002

Please refer to the attached return to service plan.

4. Liquid Holdup Tanks and Gas Storage Tanks

Zion Station ODCM Section 12.7.2 requires a description of events leading to liquid holdup tanks or gas storage tanks exceeding technical specification limits to be included in the Annual Radioactive Effluent Release Report.

There was no activity present in any gas decay tanks during 2002.
No liquid holdup tanks exceeded the limits of Permanently Defueled Technical Specifications 5.6.3. during 2002.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)

ADDENDUM

5. Estimates of Total Error

The following is an estimate of the total error associated with certain total values in the Annual Radioactive Effluent Release Report. The total error is determined by calculating the square root of the sum of the squares of the individual errors.

a. Gaseous Effluents

Sampling Error	5%
Calibration Error	10%
Counting Statistics Error	17%
Sample Volume Error	10%
<hr/> Total Error	<hr/> 23%

b. Liquid Effluents

Sampling Error	5%
Calibration Error	10%
Counting Statistics Error	16%
Sample Volume Error	2%
<hr/> Total Error	<hr/> 20%

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
LIQUID RELEASES
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)
SUMMATION OF ALL RELEASES

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
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A. Fission and Activation Products (not incl. tritium, gases, alpha)

1. Total Activity Released	Ci	<LLD	<LLD	1.94E+03	1.94E+03	<LLD	<LLD	<LLD	3.62E+03	3.62E+03	3.37E+03	1.83E+03	<LLD	6.26E+03	<LLD	3.85E+04	<LLD	3.85E+04	1.11E+02
2. Average Conc. Released	uCi/ml	<LLD	<LLD	4.56E+10	2.61E+11	<LLD	<LLD	<LLD	1.01E+09	3.32E+10	9.09E+10	4.93E+10	<LLD	4.77E+10	<LLD	1.07E+10	<LLD	3.49E+11	1.07E+10
3. % of Value (9E-7 uCi/ml)	%	<LLD	<LLD	5.51E-02	2.90E-03	<LLD	<LLD	<LLD	1.12E-01	3.88E-02	1.01E-01	5.48E-02	<LLD	6.26E-02	<LLD	1.19E-02	<LLD	3.88E-03	1.19E-02

B. Tritium

1. Total Activity Released	Ci	<LLD	<LLD	7.58E+03	7.58E+03	<LLD	<LLD	<LLD	3.19E+02	3.19E+02	2.66E+02	2.08E+04	<LLD	2.68E+02	<LLD	2.50E+03	<LLD	2.50E+03	6.88E+02
2. Average Conc. Released	uCi/ml	<LLD	<LLD	2.04E+09	1.07E+10	<LLD	<LLD	<LLD	8.90E+09	2.89E+09	7.17E+09	5.60E+11	<LLD	2.43E+09	<LLD	6.95E+10	<LLD	6.95E+10	6.64E+10
3. % of Value (1E-3 uCi/ml)	%	<LLD	<LLD	2.04E-04	1.07E-05	<LLD	<LLD	<LLD	8.90E-04	2.89E-04	7.17E-04	5.60E-06	<LLD	2.43E-04	<LLD	6.95E-05	<LLD	6.95E-05	6.64E-05

C. Dissolved and Entrained Gases

1. Total Activity Released	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Conc. Released	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
3. % of Value (7E-5 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

D. Gross Alpha

1. Total Activity Released	Ci	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
2. Average Conc. Released	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
3. % of Value (2E-9 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

E. Volume of Releases

1. Volume of Waste Released	liters	4.92E+06	4.42E+06	6.40E+06	1.67E+07	5.88E+06	5.47E+06	5.70E+06	1.71E+07	5.71E+06	5.11E+06	5.13E+06	1.68E+07	4.97E+06	4.87E+06	4.70E+06	1.48E+07	6.34E+07
2. Volume of Dilution Water	liters	4.51E+10	2.19E+10	3.71E+09	7.07E+10	3.59E+09	3.71E+09	3.58E+09	1.08E+10	3.70E+09	3.71E+09	3.59E+09	1.10E+10	3.71E+09	3.59E+09	3.71E+09	1.10E+10	1.04E+11

§ Fe-55, Sr-89, and Sr-90 Activities are quantified by quarterly composite analyses. Therefore, the difference between the Fission and Activation Products total quarterly activity and the sum of the total activities of the three corresponding months equals the total quarterly activities of Fe-55, Sr-89, and Sr-90. The cells for monthly activity values of Fe-55, Sr-89, and Sr-90 on the Batch and Continuous Mode data sheets are blank because monthly values are not applicable.

† These data include only information for batch releases from Lake Discharge Tanks.

Lower limit of detection (LLD) values are presented in the Liquid Effluents LLD Values for Liquid Releases section. The abbreviation "<LLD" indicates the activity concentration of the radionuclide for each individual sample analyzed during the applicable period was less than the LLD value for that nuclide. If the abbreviation "<LLD" is listed for a group of radionuclides, the activity concentration of each radionuclide for each sample during the period was less than the LLD value for the respective radionuclide.

The abbreviation "No Det" indicates that no releases were performed during the applicable period.

% of Value means percent of concentration values in Appendix B, Table 2, Column 2 to 10CCFR20. The % of Value for Fission and Activation Products and Dissolved and Entrained Gases provides a comparison of the total concentration of the group to the lowest isotopic concentration value of the particular group. The concentration of Fission and Activation Products and Dissolved and Entrained Gases are compared to the concentration limits for Cs-134 (9E-7 uCi/ml) and A-41 (7E-5 uCi/ml), respectively. Concentration limits for Dissolved and Entrained Gases are listed in ODCM Table 12.3-1.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
LIQUID RELEASES
UNIT 1 (Docket Numbers 50-295)
SUMMATION OF ALL RELEASES

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
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A. Fission and Activation Products (not incl. tritium, gases, alpha)

1. Total Activity Released	Cl	<LLD	<LLD	1.94E-03	1.94E-03	<LLD	<LLD	3.62E-03	3.62E-03	3.37E-03	1.83E-03	<LLD	5.20E-03	<LLD	3.85E-04	<LLD	3.85E-04	1.11E-02
2. Average Conc. Released	uCi/ml	<LLD	<LLD	4.37E-09	3.05E-11	<LLD	<LLD	8.87E-09	2.92E-09	7.90E-09	4.34E-09	<LLD	6.16E-09	<LLD	1.11E-05	<LLD	1.11E-05	1.74E-10
3. % of Value (9E-7 uCi/ml)	%	<LLD	<LLD	4.85E-01	3.38E-03	<LLD	<LLD	9.85E-01	3.28E-01	8.87E-01	4.83E-01	<LLD	6.85E-01	<LLD	1.23E+03	<LLD	1.23E+03	1.94E-02

B. Tritium

1. Total Activity Released	Cl	<LLD	<LLD	7.58E-03	7.58E-03	<LLD	<LLD	3.18E-02	3.18E-02	2.66E-02	2.08E-02	<LLD	4.74E-02	<LLD	2.53E-03	<LLD	2.53E-03	8.94E-02
2. Average Conc. Released	uCi/ml	<LLD	<LLD	1.80E-08	1.28E-10	<LLD	<LLD	7.82E-08	2.88E-08	6.30E-08	4.93E-08	<LLD	6.61E-08	<LLD	7.29E-05	<LLD	7.29E-05	1.41E-09
3. % of Value (1E-3 uCi/ml)	%	<LLD	<LLD	1.80E-03	1.28E-05	<LLD	<LLD	7.82E-03	2.88E-03	6.30E-03	4.93E-03	<LLD	6.61E-03	<LLD	7.29E+00	<LLD	7.29E+00	1.41E-04

C. Dissolved and Entrained Gases

1. Total Activity Released	Cl	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Conc. Released	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
3. % of Value (7E-5 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

D. Gross Alpha

1. Total Activity Released	Cl	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
2. Average Conc. Released	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
3. % of Value (2E-9 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD

E. Volume of Releases

1. Volume of Waste Released	Meters	0.00E+00	0.00E+00	5.38E+04	5.38E+04	0.00E+00	0.00E+00	1.65E+05	1.65E+05	1.75E+05	1.73E+05	0.00E+00	3.44E+05	0.00E+00	3.47E+04	0.00E+00	3.47E+04	6.02E+05	
2. Volume of Diversion Water	Meters	4.14E+10	1.86E+10	4.22E+08	6.04E+10	4.08E+08	4.22E+08	4.08E+08	1.24E+09	4.22E+08	4.22E+08	4.08E+08	8.44E+08	4.22E+08	4.00E+08	4.22E+08	4.00E+08	8.44E+08	6.33E+10

5 Fe-55, Sr-89, and Sr-90 Activities are quantified by quarterly composite analyses. Therefore, the difference between the Fission and Activation Products total quarterly activity and the sum of the total activities of the three corresponding months equals the total quarterly activities of Fe-55, Sr-89, and Sr-90. The calls for monthly activity values of Fe-55, Sr-89, and Sr-90 on the Batch and Continuous Mode data sheets are blank because monthly values are not applicable.

† These data include only information for batch releases from Lake Discharge Tanks.

Lower limit of detection (LLD) values are presented in the Liquid Effluents LLD Values for Liquid Releases section. The abbreviation "<LLD" indicates the activity concentration of the radionuclide for each individual sample analyzed during the applicable period was less than the LLD value for that nuclide. If the abbreviation "<LLD" is listed for a group of radionuclides, the activity concentration of each radionuclide for each sample during the period was less than the LLD value for the respective radionuclide.

The abbreviation "No Ref" indicates that no releases were performed during the applicable period.

% of Value" means percent of concentration values in Appendix B, Table 2, Column 2 to 10CFR20. The % of Value for Fission and Activation Products and Dissolved and Entrained Gases provides a comparison of the total concentration of the group to the lowest isotopic concentration value of the particular group. The concentration of Fission and Activation Products and Dissolved and Entrained Gases are compared to the concentration limits for Cs-134 (9E-7 uCi/ml) and Ar-41 (7E-5 uCi/ml), respectively. Concentration limits for Dissolved and Entrained Gases are listed in ODCM Table 12.3-1.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
LIQUID RELEASES
UNIT 2 (Pocket Numbers 50-304)
SUMMATION OF ALL RELEASES

Units	Jan	Feb	Mar	1st Qtr	Apr	May	Jun	2nd Qtr	Jul	Aug	Sep	3rd Qtr	Oct	Nov	Dec	4th Qtr	Total
-------	-----	-----	-----	---------	-----	-----	-----	---------	-----	-----	-----	---------	-----	-----	-----	---------	-------

A. Fission and Activation Products (not incl. tritium, gases, alpha)

1. Total Activity Released \$	Cl	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Conc. Released uCi/ml	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
3. % of Value (9E-7 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

B. Tritium

1. Total Activity Released	Cl	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Conc. Released uCi/ml	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
3. % of Value (1E-3 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

C. Dissolved and Entrained Gases

1. Total Activity Released	Cl	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
2. Average Conc. Released uCi/ml	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00
3. % of Value (7E-5 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	0.00E+00

D. Gross Alpha

1. Total Activity Released	Cl	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
2. Average Conc. Released uCi/ml	uCi/ml	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD
3. % of Value (2E-9 uCi/ml)	%	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	<LLD	#VALUE!

E. Volume of Releases

1. Volume of Waste Released Mers	Mers	4.92E+06	4.42E+06	6.35E+06	1.57E+07	5.98E+06	5.47E+06	5.53E+06	1.70E+07	5.53E+06	4.94E+06	5.13E+06	1.66E+07	4.97E+06	4.84E+06	4.70E+06	1.45E+07	6.28E+07
2. Volume of Dilution Waters Mers	Mers	4.46E+10	2.18E+10	2.75E+09	6.92E+10	3.49E+09	3.29E+09	3.17E+09	9.95E+09	3.28E+09	3.29E+09	3.17E+09	9.74E+09	3.29E+09	3.17E+09	3.29E+09	9.75E+09	9.86E+10

§ Fe-55, Sr-89, and Sr-90 Activities are quantified by quarterly composite analyses. Therefore, the difference between the Fission and Activation Products total quarterly activity and the sum of the total activities of the three corresponding months equals the total quarterly activities of Fe-55, Sr-89, and Sr-90. The calls for monthly activity values of Fe-55, Sr-89, and Sr-90 on the Batch and Continuous Mode data sheets are blank because monthly values are not applicable.

‡ These data include only information for batch releases from Lake Discharge Tanks.

Lower limit of detection (LLD) values are presented in the Liquid Effluents LLD Values for Liquid Releases section. The abbreviation "<LLD" indicates the activity concentration of the radionuclide for each individual sample analyzed during the applicable period was less than the LLD value for that nuclide. If the abbreviation "<LLD" is listed for a group of radionuclides, the activity concentration of each radionuclide for each sample during the period was less than the LLD value for the respective radionuclide.

The abbreviation "No Ref" indicates that no releases were performed during the applicable period.

% of Value" means percent of concentration values in Appendix B, Table 2, Column 2 to 100CFR20. The % of Value for Fission and Activation Products and Dissolved and Entrained Gases provides a comparison of the total concentration of the group to the lowest isotopic concentration value of the particular group. The concentration of Fission and Activation Products and Dissolved and Entrained Gases are compared to the concentration limits for Cs-134 (9E-7 uCi/ml) and Ar-41 (7E-5 uCi/ml), respectively. Concentration limits for Dissolved and Entrained Gases are listed in ODCM Table 12-3-1.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
UNIT 1 (Docket Number 50-295)

LIQUID EFFLUENTS
SUPPLEMENTAL RELEASE INFORMATION

1	Batch Releases	1st Qtr	2nd Qtr	3rd Qtr	4th Qtr	2002
	a. Total Number of Batch Releases	1	3	6	1	11

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)

LIQUID EFFLUENTS
LOWER LIMIT OF DETECTION (LLD) VALUES FOR LIQUID RELEASES

<u>Isotope</u>	<u>LLD (uCi/ml)</u>
Alpha	1.00E-07
H-3	1.00E-05
Kr-85	1.00E-05
Mn-54	5.00E-07
Fe-55	1.00E-06
Co-58	5.00E-07
Fe-59	5.00E-07
Co-60	5.00E-07
Zn-65	5.00E-07
Sr-89	5.00E-08
Sr-90	5.00E-08
Mo-99	5.00E-07
Cs-134	5.00E-07
Cs-137	5.00E-07
Ce-141	5.00E-07
Ce-144	5.00E-07

NOTE: LLDs for other liquid effluent isotopes included in the Annual Radioactive Effluent Release Report were not available for submittal.

ZION NUCLEAR POWER STATION
 ANNUAL RADIOACTIVE EFFLUENT RELEASE REPORT FOR 2002
 UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

Radioactive Waste Shipments for 2002

Shipment Date	Shipment Number	Media	Receiver	Waste Class	Container Type	Solidification Agent	Activity (Ci)	Volume (m ³)
1st Quarter:	0						0.0000000	0.00
Sub totals:							0.0000000	0.00
2nd Quarter:	0						0.0000000	0.00
Sub totals:							0.0000000	0.00
3rd Quarter:	0						0.0000000	0.00
Sub totals:							0.0000000	0.00
4th Quarter:	ZRW02-001	DAW	GTS Duratek GRF	A	Seavan	None	0.0005415	57.490
10/21/2002							0.0005415	57.490
Sub totals:	1						0.0005415	2030.00
Totals:	1						0.0005415	2030.00

	Class A	Class B	Class C
Number of Shipments	3	0	0
Activity (Ci)	5.42E-04	0.00E+00	0.00E+00
Volume (m ³)	5.75E+01	0.00E+00	0.00E+00

**ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT REPORT FOR 2002
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)**

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

3. Solid Waste Disposition

<u>Number of Shipments</u>	<u>Mode of Transportation</u>	<u>Destination</u>
1	Exclusive Use Vehicle	Kinston, Tennessee(GTS Duratek, GRF)

B. IRRADIATED FUEL SHIPMENTS

No irradiated fuel shipments were performed during 2002.

ZION NUCLEAR POWER STATION
ANNUAL RADIOACTIVE EFFLUENT REPORT FOR 2002
UNIT 1 & 2 (Docket Numbers 50-295 & 50-304)

SOLID WASTE AND IRRADIATED FUEL SHIPMENTS

A. SOLID WASTE SHIPPED OFFSITE FOR BURIAL OR DISPOSAL (Not irradiated fuel)

1. Type of waste and
2. Estimate of major nuclide composition
- c. Irradiated components, control rods, etc.

No irradiated component shipments were performed during 2002.

Attachment 2:

To the Zion Nuclear Power Station, Units 1 and 2, 2002 Radioactive Effluent Release Report.

The following identifies those actions committed to by Exelon Nuclear in this document. Any other actions discussed in this submittal represent intended or planned actions by Exelon Nuclear. They are described to the NRC for the NRC's information, and are not Regulatory Commitments.

Commitment:

None

TABLE 7

Zion Nuclear Station
35 ft. Wind Speed and Direction

January-March, 2002
250Ft-33Pt Delta-T (F)

Number of Observations = 2113
Values are Percent Occurrence

SPEED CLASS	WIND DIRECTION CLASSES																STABILITY CLASSES								
	N	NNB	NE	ENB	E	ESB	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
																									0.00
																									0.00
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 SU	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- N	0.00	0.00	0.00	0.05	0.09	0.09	0.05	0.00	0.05	0.00	0.24	0.09	0.14	0.09	0.24	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 SS	0.00	0.09	0.19	0.14	0.05	0.05	0.00	0.19	0.05	0.24	0.28	0.05	0.09	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.14	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
																									0.14
																									3.12
EU	0.14	0.14	0.28	0.14	0.19	0.19	0.09	0.00	0.00	0.05	0.09	0.14	0.24	0.09	0.14	0.05	1.99	1.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.05	0.00	0.19	0.24	0.00	0.85	0.85	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4 SU	0.05	0.14	0.00	0.05	0.05	0.14	0.00	0.00	0.00	0.00	0.09	0.24	0.14	0.28	0.19	0.00	1.47	1.47	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- N	0.47	0.24	0.14	0.33	0.28	0.38	0.52	0.24	0.33	0.52	0.95	1.33	1.14	1.04	0.99	1.18	10.08	10.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 SS	0.05	0.14	0.14	0.05	0.38	0.43	0.14	0.80	1.61	0.95	1.56	2.27	2.37	1.23	0.47	0.05	12.64	12.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.14	0.14	0.05	0.00	0.09	0.00	0.05	0.28	0.43	0.19	0.14	0.33	0.43	0.14	0.00	0.00	2.41	2.41	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.33	0.00	0.09	0.09	0.28	0.24	0.05	0.00	1.23	1.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
																									30.67
EU	0.05	0.95	0.43	0.09	0.05	0.00	0.28	0.24	0.05	0.43	1.28	1.14	1.75	0.95	0.80	0.09	8.57	8.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.33	0.28	0.00	0.00	0.19	0.00	0.00	0.05	0.14	0.19	0.24	0.38	0.33	0.19	0.28	0.09	2.70	2.70	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 SU	0.57	0.24	0.05	0.24	0.05	0.00	0.09	0.09	0.09	0.28	0.38	0.38	0.38	0.43	0.52	0.38	4.16	4.16	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- N	1.85	0.99	0.57	0.62	0.62	0.43	0.38	1.47	0.62	1.33	4.45	3.22	2.65	2.08	2.08	1.89	25.22	25.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 SS	0.00	0.14	0.05	0.05	0.05	0.09	0.09	0.71	0.85	0.57	1.09	1.51	0.43	0.05	0.00	0.00	5.68	5.68	0.00	0.00	0.00	0.00	0.00	0.00	0.00
2 MS	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.19	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	0.47	0.00	0.00	0.00	0.00	0.00	0.00	
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.19	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.33	0.33	0.00	0.00	0.00	0.00	0.00	0.00	0.00
																									47.14
EU	0.14	0.19	0.28	0.05	0.00	0.00	0.00	0.00	0.09	0.33	0.66	0.33	1.23	0.33	0.57	0.05	4.26	4.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.05	0.19	0.00	0.00	0.00	0.00	0.00	0.05	0.24	0.14	0.05	0.19	0.14	0.24	0.14	1.42	1.42	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SU	0.24	0.24	0.19	0.05	0.05	0.00	0.00	0.00	0.00	0.24	0.38	0.19	0.33	0.00	0.05	0.14	2.08	2.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	1.09	0.14	0.43	1.23	0.38	0.00	0.00	0.52	0.24	1.47	1.33	0.95	0.62	0.14	0.24	0.19	8.94	8.94	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS	0.00	0.00	0.00	0.09	0.00	0.05	0.00	0.05	0.24	0.05	0.09	0.09	0.00	0.00	0.00	0.00	0.66	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
																									17.46

TABLE 8

Zion Nuclear Station
35 ft. Wind Speed and Direction

April-June, 2002
250Ft-33Ft Delta-T (F)

Number of Observations = 2176
Values are Percent Occurrence

SPEED CLASS	WIND DIRECTION CLASSES																STABILITY CLASSES								
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 SU	0.00	0.14	0.09	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	0.18	0.23	0.09	0.09	0.18	0.05	0.05	0.00	0.28	0.18	0.18	0.09	0.05	0.14	0.14	0.14	2.07	0.32	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 SS	0.09	0.18	0.32	0.28	0.28	0.14	0.14	0.37	0.28	0.32	0.41	0.37	0.23	0.23	0.09	0.09	3.81	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.05	0.28	0.09	0.05	0.05	0.00	0.05	0.14	0.37	0.60	0.28	0.32	0.41	0.41	0.23	0.18	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.05	0.05	0.00	0.14	0.14	0.05	0.09	0.09	0.69	0.64	0.37	0.14	0.09	0.00	0.05	0.00	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.14	1.06	0.55	0.41	0.37	0.46	0.09	0.14	0.05	0.00	0.18	0.18	0.37	0.51	0.14	0.05	4.69	4.69	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.28	0.23	0.32	0.05	0.14	0.05	0.14	0.00	0.09	0.00	0.14	0.09	0.05	0.00	0.23	0.18	1.98	1.98	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4 SU	0.60	0.41	0.14	0.09	0.14	0.09	0.09	0.28	0.09	0.00	0.05	0.09	0.18	0.18	0.05	0.28	2.76	2.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	1.10	0.92	0.74	0.37	0.28	0.74	0.87	1.70	0.97	0.28	0.46	0.32	0.64	1.01	0.60	0.78	11.76	11.76	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 SS	0.55	0.23	0.28	0.23	0.09	0.23	0.69	1.98	2.80	1.19	0.83	0.51	1.10	1.29	0.37	0.23	12.59	12.59	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.23	0.18	0.09	0.05	0.00	0.05	0.46	1.24	1.84	0.51	0.28	0.23	0.64	0.64	0.14	0.00	6.57	6.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.09	0.00	0.09	0.23	0.41	1.52	0.46	0.14	0.32	0.37	0.14	0.00	0.00	3.77	3.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.64	1.75	0.69	0.28	0.51	0.55	0.64	0.05	0.05	0.28	0.69	1.06	0.87	0.78	0.87	0.14	9.83	9.83	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.09	0.05	0.00	0.00	0.00	0.09	0.09	0.09	0.00	0.09	0.05	0.14	0.14	0.09	0.37	0.09	1.38	1.38	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 SU	0.78	0.23	0.09	0.05	0.09	0.05	0.00	0.09	0.00	0.00	0.09	0.14	0.23	0.18	0.37	0.18	2.57	2.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	1.52	1.52	0.18	0.46	0.37	0.60	1.06	0.74	0.83	1.79	0.83	0.46	0.51	0.09	0.74	11.86	11.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS	0.18	0.09	0.00	0.09	0.00	0.09	0.18	1.24	0.41	0.23	0.32	0.18	0.05	0.09	0.05	0.05	3.26	3.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.05	0.00	0.00	0.00	0.00	0.00	0.05	1.01	0.37	0.00	0.00	0.00	0.05	0.00	0.00	0.00	1.52	1.52	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.05	1.06	0.60	0.00	0.00	0.00	0.05	0.00	0.00	0.00	1.75	1.75	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.32	1.19	0.00	0.05	0.18	0.05	0.00	0.00	0.00	0.46	0.18	0.18	0.41	0.46	0.00	0.00	3.49	3.49	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.05	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SU	0.28	0.05	0.05	0.55	0.14	0.00	0.00	0.00	0.00	0.09	0.18	0.00	0.09	0.05	0.05	0.05	1.56	1.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	1.10	0.37	0.09	0.18	0.41	0.23	0.00	0.05	0.00	0.69	0.60	0.18	0.37	0.28	0.00	0.00	4.55	4.55	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS	0.00	0.00	0.05	0.00	0.09	0.05	0.05	0.18	0.00	0.18	0.00	0.00	0.05	0.00	0.00	0.00	0.64	0.64	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 9

Zion Nuclear Station
35 ft. Wind Speed and Direction

July-September, 2002
250Ft-33Ft Delta-T (F)

Number of Observations = 2205
Values are Percent Occurrence

SPEED CLASS	WIND DIRECTION CLASSES																STABILITY CLASSES								
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	ES	TOTAL
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.05	0.05	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.09	0.09	0.09	0.00	0.45	0.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.05	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.18	0.18	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 SU	0.05	0.00	0.05	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- N	0.36	0.00	0.27	0.14	0.23	0.36	0.00	0.14	0.18	0.27	0.18	0.09	0.00	0.27	0.36	0.27	3.13	3.13	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 SS	0.32	0.45	0.23	0.18	0.14	0.05	0.09	0.14	0.41	0.45	0.32	0.27	0.45	0.32	0.27	0.18	4.26	4.26	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.32	0.09	0.09	0.05	0.00	0.05	0.00	0.05	0.36	0.86	0.95	0.63	0.36	0.54	0.54	0.45	5.35	5.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
-ES	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.59	0.73	1.09	1.09	1.00	0.59	0.05	5.35	5.35	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.32	1.36	2.59	1.50	2.04	2.04	1.81	0.50	0.36	0.32	0.45	1.00	0.82	0.18	0.59	0.18	16.05	16.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.14	0.23	0.09	0.00	0.14	0.32	0.32	0.09	0.09	0.00	0.00	0.09	0.18	0.05	0.09	0.09	2.22	2.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
4 SU	0.14	0.27	0.18	0.14	0.14	0.14	0.36	0.50	0.23	0.05	0.14	0.14	0.18	0.00	0.14	0.05	2.77	2.77	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- N	0.86	1.32	0.73	0.27	0.77	1.09	1.36	1.54	1.63	0.95	1.22	0.63	0.77	0.50	0.45	0.45	14.56	14.56	0.00	0.00	0.00	0.00	0.00	0.00	0.00
7 SS	0.86	0.59	0.23	0.05	0.23	0.23	0.54	0.73	1.50	2.45	1.13	1.13	1.00	0.36	0.68	0.41	12.11	12.11	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.18	0.05	0.05	0.00	0.00	0.00	0.05	0.09	0.45	0.50	0.50	0.45	0.63	0.41	0.23	0.32	3.90	3.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.09	0.00	0.05	0.54	1.32	0.95	0.00	0.00	2.99	2.99	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.82	1.54	0.86	0.45	0.00	0.32	0.82	1.45	0.41	0.50	1.18	0.73	0.82	0.00	0.05	0.09	10.02	10.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.18	0.05	0.09	0.05	0.00	0.09	0.05	0.14	0.09	0.09	0.23	0.09	0.14	0.09	0.00	0.00	1.36	1.36	0.00	0.00	0.00	0.00	0.00	0.00	0.00
3 SU	0.23	0.14	0.00	0.00	0.00	0.00	0.14	0.50	0.18	0.05	0.36	0.14	0.09	0.05	0.00	0.05	1.90	1.90	0.00	0.00	0.00	0.00	0.00	0.00	0.00
- N	1.68	0.54	0.36	0.14	0.18	0.41	0.14	1.04	0.32	1.04	1.41	0.68	0.23	0.23	0.18	0.14	8.71	8.71	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS	0.36	0.05	0.09	0.14	0.00	0.09	0.00	0.23	0.05	0.23	0.09	0.32	0.09	0.05	0.05	0.05	1.86	1.86	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.27	0.00	0.00	0.09	0.00	0.00	0.00	0.00	0.00	0.23	0.36	0.05	0.00	0.00	0.00	0.00	1.00	1.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SU	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14	0.00	0.00	0.00	0.00	0.00	0.00	0.00
N	0.18	0.09	0.27	0.18	0.05	0.00	0.00	0.14	0.00	0.00	0.32	0.00	0.00	0.00	0.00	0.00	1.22	1.22	0.00	0.00	0.00	0.00	0.00	0.00	0.00
SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

TABLE 10

Zion Nuclear Station
35 ft. Wind Speed and Direction

October-December, 2002
250Ft-33Ft Delta-T (F)

Number of Observations = 2197
Values are Percent Occurrence

SPEED CLASS	WIND DIRECTION CLASSES																STABILITY CLASSES								
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	RS	TOTAL
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
RS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
																									0.00
EU	0.00	0.00	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05							
MU	0.00	0.00	0.05	0.00	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.09							
1 SU	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14							
- N	0.05	0.09	0.05	0.14	0.14	0.00	0.05	0.09	0.05	0.09	0.05	0.05	0.14	0.18	0.46	0.09	1.68	1.68							
3 SS	0.00	0.14	0.05	0.14	0.18	0.09	0.00	0.05	0.14	0.32	0.27	0.23	0.41	1.00	0.36	0.09	3.46	3.46							
MS	0.00	0.00	0.00	0.00	0.00	0.00	0.05	0.05	0.09	0.36	0.18	0.27	0.41	0.32	0.14	0.14	2.00	2.00							
- R	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.23	0.27	0.14	0.00	0.27	0.00	1.14	1.14							
																									8.56
*EU	0.18	0.46	0.41	0.32	0.18	0.18	0.09	0.00	0.00	0.09	0.14	0.09	0.14	0.36	0.32	0.05	3.00	3.00							
MU	0.00	0.05	0.05	0.05	0.00	0.00	0.00	0.00	0.00	0.05	0.00	0.05	0.14	0.00	0.05	0.00	0.41	0.41							
4 SU	0.09	0.09	0.14	0.14	0.05	0.09	0.09	0.05	0.05	0.05	0.00	0.00	0.14	0.05	0.18	0.00	1.18	1.18							
- N	0.32	0.59	0.23	0.32	0.09	0.00	0.41	0.27	0.41	0.55	0.64	1.41	1.32	1.46	2.69	1.23	11.93	11.93							
7 SS	0.27	0.14	0.00	0.27	0.18	0.23	0.14	0.46	0.77	2.23	2.05	1.41	3.14	1.82	2.14	1.05	16.29	16.29							
MS	0.00	0.00	0.00	0.00	0.05	0.05	0.00	0.27	0.50	0.46	0.59	0.59	0.96	0.46	0.86	0.05	4.82	4.82							
RS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.14	0.32	0.55	0.55	0.55	0.36	0.00	2.55	2.55							
																									40.19
EU	0.32	0.18	0.27	0.23	0.00	0.09	0.09	0.18	0.05	0.27	0.64	0.00	0.77	0.64	0.50	0.23	4.46	4.46							
MU	0.09	0.00	0.09	0.05	0.09	0.05	0.00	0.05	0.05	0.09	0.23	0.05	0.23	0.05	0.09	0.14	1.32	1.32							
8 SU	0.27	0.05	0.14	0.14	0.09	0.14	0.05	0.05	0.00	0.05	0.55	0.41	0.27	0.32	0.23	0.27	3.00	3.00							
- N	1.32	1.78	1.14	0.18	0.32	0.64	0.64	0.86	0.50	0.77	2.00	2.37	2.59	1.14	1.64	1.00	18.89	18.89							
1 SS	0.46	0.18	0.00	0.09	0.00	0.09	0.05	0.23	0.18	0.96	1.59	2.05	1.82	0.55	0.41	0.46	9.10	9.10							
2 MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.23	0.27	0.00	0.09	0.05	0.00	0.00	0.00	0.00	0.64	0.64							
RS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.09	0.05	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.14	0.14							
																									37.55
EU	0.00	0.00	0.05	0.14	0.00	0.00	0.00	0.23	0.00	0.05	0.09	0.00	0.00	0.00	0.00	0.00	0.55	0.55							
1 MU	0.00	0.00	0.05	0.05	0.00	0.00	0.00	0.05	0.00	0.05	0.09	0.00	0.00	0.00	0.00	0.00	0.27	0.27							
3 SU	0.00	0.00	0.18	0.32	0.32	0.09	0.00	0.05	0.00	0.14	0.23	0.09	0.05	0.09	0.00	0.00	1.55	1.55							
- N	0.46	0.27	0.77	0.41	0.46	1.37	0.05	0.23	0.00	0.36	0.55	0.55	1.55	0.09	0.59	0.23	7.92	7.92							
1 SS	0.00	0.00	0.05	0.00	0.00	0.00	0.23	0.41	0.05	0.32	1.09	0.41	0.27	0.00	0.00	0.00	2.82	2.82							
8 Y	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
RS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00							
																									13.11

TABLE 11

Zion Nuclear Station
35 ft. Wind Speed and Direction

January-December, 2002
250Ft-33Ft Delta-T (F)

Number of Observations = 8691
Values are Percent Occurrence

SPEED CLASS	WIND DIRECTION CLASSES																STABILITY CLASSES								
	N	NNE	NE	ENE	E	ESE	SE	SSE	S	SSW	SW	WSW	W	WNW	NW	NNW	TOTAL	EU	MU	SU	N	SS	MS	RS	TOTAL
EU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
MU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
C SU	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A N	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
L SS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
M MS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
ES	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
EU	0.01	0.01	0.00	0.01	0.02	0.00	0.00	0.00	0.00	0.01	0.00	0.00	0.02	0.02	0.02	0.00	0.14	0.14	0.08	0.20	2.01	3.29	2.78	2.32	10.83
MU	0.00	0.00	0.02	0.02	0.02	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
1 SU	0.01	0.05	0.05	0.02	0.01	0.01	0.01	0.01	0.00	0.00	0.00	0.00	0.00	0.01	0.01	0.00	0.20	0.08	0.20	2.01	3.29	2.78	2.32	10.83	
- N	0.15	0.08	0.10	0.10	0.16	0.13	0.03	0.06	0.14	0.14	0.16	0.08	0.08	0.17	0.30	0.13	2.01	0.08	0.20	2.01	3.29	2.78	2.32	10.83	
3 SS	0.10	0.22	0.20	0.18	0.16	0.08	0.06	0.18	0.22	0.33	0.32	0.23	0.30	0.43	0.18	0.09	3.29	0.08	0.20	2.01	3.29	2.78	2.32	10.83	
MS	0.13	0.09	0.06	0.02	0.01	0.01	0.02	0.06	0.21	0.46	0.36	0.31	0.30	0.32	0.23	0.20	2.78	0.08	0.20	2.01	3.29	2.78	2.32	10.83	
-RS	0.03	0.02	0.00	0.03	0.03	0.01	0.02	0.03	0.22	0.37	0.33	0.38	0.33	0.25	0.23	0.01	2.32	0.08	0.20	2.01	3.29	2.78	2.32	10.83	
-EU	0.20	0.76	0.97	0.60	0.70	0.72	0.53	0.16	0.10	0.12	0.22	0.36	0.39	0.29	0.30	0.08	6.49	6.49	1.37	2.05	12.10	13.42	4.44	2.65	42.52
MU	0.10	0.13	0.14	0.03	0.07	0.09	0.12	0.10	0.05	0.05	0.06	0.07	0.09	0.06	0.15	0.07	1.37	1.37	2.05	12.10	13.42	4.44	2.65	42.52	
SU	0.22	0.23	0.12	0.10	0.09	0.12	0.14	0.21	0.12	0.02	0.07	0.12	0.16	0.13	0.14	0.08	2.05	1.37	2.05	12.10	13.42	4.44	2.65	42.52	
N	0.69	0.77	0.46	0.32	0.36	0.55	0.79	0.94	0.84	0.58	0.82	0.92	0.97	1.00	1.19	0.91	12.10	1.37	2.05	12.10	13.42	4.44	2.65	42.52	
SS	0.44	0.28	0.16	0.15	0.22	0.28	0.38	0.99	1.67	1.71	1.39	1.32	1.90	1.17	0.92	0.44	13.42	1.37	2.05	12.10	13.42	4.44	2.65	42.52	
MS	0.14	0.09	0.05	0.01	0.03	0.02	0.14	0.47	0.81	0.41	0.38	0.40	0.67	0.41	0.31	0.09	4.44	1.37	2.05	12.10	13.42	4.44	2.65	42.52	
RS	0.00	0.00	0.00	0.02	0.00	0.02	0.07	0.14	0.51	0.15	0.15	0.38	0.63	0.47	0.10	0.00	2.65	1.37	2.05	12.10	13.42	4.44	2.65	42.52	
EU	0.46	1.10	0.56	0.26	0.14	0.24	0.46	0.48	0.14	0.37	0.94	0.72	1.05	0.59	0.55	0.14	8.22	8.22	1.68	2.90	16.09	4.97	0.68	0.56	35.09
MU	0.17	0.09	0.05	0.02	0.07	0.06	0.03	0.08	0.07	0.12	0.18	0.16	0.21	0.10	0.18	0.08	1.68	1.68	2.90	16.09	4.97	0.68	0.56	35.09	
SU	0.46	0.16	0.07	0.10	0.06	0.05	0.07	0.18	0.07	0.09	0.35	0.26	0.24	0.24	0.28	0.22	2.90	1.68	2.90	16.09	4.97	0.68	0.56	35.09	
N	1.59	1.21	0.56	0.35	0.37	0.52	0.33	1.10	0.54	0.99	2.39	1.76	1.47	0.98	0.99	0.93	16.09	1.68	2.90	16.09	4.97	0.68	0.56	35.09	
SS	0.25	0.12	0.03	0.09	0.01	0.09	0.08	0.60	0.37	0.49	0.77	1.01	0.60	0.18	0.13	0.14	4.97	1.68	2.90	16.09	4.97	0.68	0.56	35.09	
MS	0.01	0.00	0.00	0.00	0.00	0.02	0.01	0.37	0.22	0.00	0.02	0.01	0.01	0.00	0.00	0.00	0.68	1.68	2.90	16.09	4.97	0.68	0.56	35.09	
RS	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.33	0.21	0.00	0.00	0.00	0.01	0.00	0.00	0.00	0.56	1.68	2.90	16.09	4.97	0.68	0.56	35.09	
SU	0.18	0.35	0.08	0.08	0.05	0.01	0.00	0.06	0.02	0.26	0.32	0.14	0.40	0.20	0.14	0.01	2.30	2.30	0.47	1.32	5.63	1.05	0.07	0.00	10.84
MU	0.01	0.02	0.06	0.01	0.01	0.00	0.00	0.01	0.01	0.08	0.06	0.02	0.05	0.03	0.06	0.03	0.47	0.47	1.32	5.63	1.05	0.07	0.00	10.84	
SU	0.13	0.08	0.10	0.23	0.13	0.02	0.00	0.01	0.00	0.12	0.22	0.07	0.12	0.03	0.02	0.05	1.32	0.47	1.32	5.63	1.05	0.07	0.00	10.84	
N	0.70	0.22	0.39	0.49	0.32	0.40	0.01	0.23	0.06	0.62	0.69	0.41	0.63	0.13	0.21	0.10	5.63	0.47	1.32	5.63	1.05	0.07	0.00	10.84	
SS	0.00	0.00	0.02	0.02	0.02	0.02	0.07	0.16	0.07	0.14	0.31	0.13	0.08	0.00	0.00	0.00	1.05	0.47	1.32	5.63	1.05	0.07	0.00	10.84	
MS	0.00	0.00	0.00	0.00	0.00	0.00	0.01	0.03	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.07	0.47	1.32	5.63	1.05	0.07	0.00	10.84	
RS	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.47	1.32	5.63	1.05	0.07	0.00	10.84	

5.5 Precipitation

Monthly totals and the maximum 24-hour and maximum 1-hour precipitation amounts are summarized below. The month with the most measured precipitation was June*. The month with the least measured precipitation was January*. The maximum 24-hour total was 1.32" * (June) and the maximum 1-hour total was 0.57" (September).

Table 12
Precipitation Totals (Inches) - 2002
Zion Site

<u>Month</u>	<u>Total</u>	<u>Maximum 24-hour</u>	<u>Maximum 1-hour</u>
January	0.03*	0.03*	0.02*
February	0.20	0.10	0.08
March	0.69	0.34	0.14
April	1.95	0.68	0.47
May	2.36	0.89	0.30
June	3.22*	1.32*	0.23*
July	0.28	0.15	0.10
August	3.11*	1.07*	0.40*
September	3.20	1.18	0.57
October	1.73*	0.57*	0.32*
November	0.31	0.12	0.06
December	0.32	0.27	0.14
TOTAL:	17.40*		

* some data are missing – actual precipitation may be under-reported

Letter to File

July 18, 2002

Subject: Zion Station Plan for the Return to Service of 2LP-084

On June 26, 2002 at 08:50 the Unit 2 Vent Stack Flow Control Panel was declared Out of Service. This Control Panel controls the flow for the radiation monitor 2RIA-PR49. A work request was written for the Instrument Maintenance Department to calibrate the control panel. The problem is the calibration of the flow-sensing monitors is not within the specified tolerances.

Zion Radiation Protection Procedure (ZRP) 5820-12 Revision 18 requires that the 2LP-084 must be returned to service within 30 days. If the monitor is not returned to service within 30 days the station is to conduct a station review to determine the plan to return the monitor to an operable status. The radiation monitor 2RIA-PR49 compensatory measures are to install a temporary blower and monitor the blower once every 24 hours. The other governing procedure is the Offsite Dose Calculation Manual (ODCM) that requires the station to obtain an estimate of the flow from the Operations Department once a day. This requirement comes from ODCM Table 12.2-3 Surveillance number 8.

The plan is to have the IM Department continue to work on the calibration of Air Monitoring Corporation Flow Panel. If the transmitters can not be adjusted to specified tolerances the IM Department will take the necessary transmitters from the Unit 1 flow panel and continue with the calibration. Engineering concurrence will be needed to verify the correct set points have been established. Once the work has been completed Operations will return the Air Monitoring Corporation Flow Panel (2LP-084) back to service.

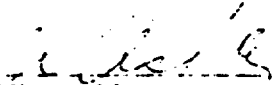
Operations and RadChem will monitor the progress of the work and maintain the required surveillances until the Flow Control Panel is returned to service.



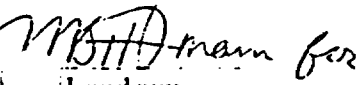
Ron Schuster
RadChem Manager



Bob Euer
Maintenance Supervisor



Jim Ashley
Regulatory Assurance



M. Landrum
Operations Manager

May 21, 2002

OSR 001/2002

To: Dave Bump
Decommissioned Plant Manager

Subject: Qualified Technical Review of revisions to the Off-site Dose Calculation Manual (ODCM)

Pursuant to ODCM Section 12.7.3 and Technical Specifications 5.6.1 and 5.9.1, the following provides basis for revision to the ODCM and documentation of the Qualified Technical Review. Section 12.7.3 of the ODCM requires an On-Site Review for revisions to the ODCM. The On-Site Review function is no longer used at Zion Station and has been replaced by Qualified Technical Review. This review will be performed by at least two individuals with the appropriate ANSI disciplines and approved by the Decommissioned Plant Manager, thereby satisfying the previous review requirements of On-Site Review and the current requirement of Qualified Technical Review.

Qualified Technical Review

<u><i>J. Cassidy</i></u> Signature/Date	<u>5-22-02</u>	<u>ABG</u> Discipline(s)
<u><i>[Signature]</i></u> Signature/Date	<u>5-30-02</u>	<u>O & F</u> Discipline(s)
<u><i>[Signature]</i></u> Signature/Date	<u>6/3/02</u>	<u>AB</u> Discipline(s)

I Concur and Approve:

[Signature]
Dave Bump
Decommissioned Plant Mgr
Zion Station

6/3/2002
Date

Introduction

This revision (1) provides for relief from continuous effluent monitoring when the release path is isolated, (2) clarifies the applicability for operability of ORT-AR13, and (3) replaces the requirements for On-Site Review of revisions to the ODCM and effluent treatment systems, to Qualified Technical Review.

Currently, the ODCM requires gaseous effluent monitoring through both Unit's Auxiliary Building (AB) Ventilation stacks whenever any supply fan or exhaust fan is running. This does not allow isolating one of the vent stacks as a release path without daily compensatory actions. The major portion of this revision provides for isolating one of the vent stacks and associated effluent monitoring equipment, with continuous radioactive effluent monitoring through the other vent stack.

Table 1 provides a summary of the revisions.

Table 1
Revision Summary

Section 10.1.1

Revise for clarification of system operation.

Section 10.1.2.1

Revise to clarify "continuously monitor".

Section 10.1.2.3

Revise for clarification.

Section 12.1.7

Delete "Frequency"

Section 12.1.26

Remove reference to radioactive iodine.

Section 12.1.28

Delete entire section

Table 12.1-1

Delete "S/U" and "EFPM" terms

Section 12.2.2.B.2

Add "when in its APPLICABLE CONDITION".

Section 12.2.2.C

Add statements defining unavailable release path from the radiologically controlled areas of the Auxiliary Building.

Table 12.2-3

Revise "APPLICABLE CONDITION" for 2.A, 2.B, 2.C, 3.C.3 and 4.A

Section 12.4.1.B

Delete 12.4.1.B.1

Delete "other than noble gasses" in 12.4.1.B.2 and change to 12.4.1.B

Section 12.4.1.C

Add basis for Unventilated Building Sampling and Analysis requirements

Table 1 (Cont)

Revision Summary

Table 12.4-1

Change second column heading from "Sample Frequency" to Sample Method"

Change Sample Method for Containment to "Grab"

Revise "Continuous Releases" and footnote 1.

Add new section "d", Unventilated Building Releases

Section 12.7.3

Replace reference to On-site Review with Qualified Technical Review.

Section 12.7.4

Replace reference to On-site Review with Qualified Technical Review. Change "FSAR" to "DSAR".

ANALYSIS FOR SAMPLING REQUIREMENTS

The unit ventilation stacks provide the normal release paths for radioactive airborne effluents from the site. Historically, the Auxiliary Building (AB) supply and exhaust fans were operated to maintain the AB and Fuel Building (FB) negative in pressure with respect to the atmospheric pressure; thus ensuring that leakage would be into the buildings, and the only release paths from those areas would be out the stacks. With the recent modifications to the FB, the FB now has its own ventilation system separate from the AB ventilation system, and no longer provides effluents to the unit ventilation stacks. As such, the unit ventilation stacks are now physically capable of providing a release path from the following areas:

Unit 1 Stack

Aux Building
Unit 1 Containment
Waste Gas Compressors
Unit 1 Off-Gas System

Unit 2 Stack

Aux Building
Unit 2 Containment
Compt & Misc Room HVAC
Unit 2 Off-Gas System

Due to the permanent shutdown status and isolation of the gas decay tanks, the waste gas compressors, and the unit Off-Gas systems; the only radiologically controlled areas that still release effluents through the stacks are the AB and the containments. The Computer & Misc Room HVAC provides ventilation to non-radiologically controlled areas within the AB. The containments are isolated from the stacks and have their own radiation monitors for releases. There are no normal evolutions that require purging of the containments due to the shutdown of the plant.

The current revision of the ODCM requires continuous monitoring of the unit stacks via the 1(2)RIA-PR49 radiation monitors whenever an AB supply fan or exhaust fan is running. This requirement does not account for the current plant status and the design of the exhaust system. Specifically; (1) when an exhaust fan is off, the exhaust fan damper is shut, and (2) the unit 1 exhaust fans 0A, 0B and 0C share the exhaust fan suction plenum with the unit 2 exhaust fans 0D, 0E and 0F. The overall effect of this design is that with all exhaust fans from one unit shutoff, and at least one exhaust fan from the other unit running, the air flow through the unit stack with all fans off, would either be negligible, or in the reverse direction.

The air flow is negligible if the closed dampers are leak tight. Monitoring the air within the stack would not be indicative of the AB environment due to the isolation from the AB.

The air flow would be in the reverse direction if the closed exhaust dampers leak by, due to the shared suction plenum. This would be true regardless of the AB pressure, since the differential pressure developed by the running fan is 2 to 6 inches of water, and the AB pressure is generally maintained negative with respect to atmospheric pressure. Monitoring the air within the stack would not be indicative of the AB environment due to the reverse flow from the outside atmosphere.

Based on the design features discussed above, continuous monitoring of an isolated exhaust stack provides no meaningful information regarding airborne effluents from the AB. Therefore, the proposed change to the ODCM is to only require continuous monitoring of the unit stacks when they are available as a release path. The unit stack is to be considered available when: (1) an exhaust fan is running, discharging to that stack, or (2) no exhaust fans for both units are running and any of the associated discharge dampers are open. The unit stack can be considered unavailable when all of the exhaust dampers to that stack are mechanically blocked closed, isolating the stack from the AB.

Item number 2 for an available stack is based on the design of the damper control circuit. Since the dampers are air operated, when the control circuit is de-energized, the damper opens. This could provide an unmonitored leak path during a loss of power to the control circuit; an event not readily noticed in the Control Room. This also provides for the requirement of an unavailable stack having the dampers mechanically blocked closed.

For the case when no AB supply and exhaust fans are running (all 6 exhaust dampers closed), airborne effluents from the AB are through leakage due to natural convection and pressure differentials between the AB and the atmosphere. Radioactive effluent monitoring is still required, however the effluent flowrate will not be measurable. The effluent flowrates for the unventilated Auxiliary Building and Fuel Building shall be estimated based on building pressure. These flowrates are conservatively estimated using the method described in Appendix A.

Appendix A

Effluent Flowrate For Unventilated Buildings

The effluent flowrate for an unventilated building is a function of the total leakage path areas and the differential pressure between the building and the atmosphere. For positive building pressure, the effluent flowrate will be out of the building. Assuming the effluent pathways are the total leakage from the normal pathways (e.g. doorways, closed supply and exhaust duct dampers, etc.) as well as unsealed penetrations, the leakage area, A_L , can be expressed as the sum of all leakage pathways.

Testing of the AB ventilation system, in various exhaust fan configurations, has shown that the normal operation of one exhaust fan at a flowrate of approximately 48,000 cfm can maintain AB building pressure at approximately $-1/2$ " of water. This flowrate is indicative of the total leakage flowrate and the total leakage area, A_L .

Using equation 2-15 from Crane's Technical Paper #410, the total leakage area, A_L can be estimated by:

$$q_e = Y C A_L \{2g(144)dP/p\}^{1/2}$$

where the effluent flowrate in cfs, q_e is 48,000/60. The values of Y and C have been chosen for a diameter ratio of 0.2 for an orifice. dP is the building pressure, and p is the air density. $Y=1$ and $C=0.6$, and the air density of 0.0764 lbf/ft³ at 60 °F are taken from Crane's Technical Paper. The building pressure is assumed to be $-1/2$ " of water = 0.01806 psi. Substituting these values into the above equation yields:

$$48000/60 = (1)(0.6)(A_L) \{2(32.2)(144)0.01806 \text{ psi}/0.0764\}^{1/2}$$

$$A_L = 28.2 \text{ sq ft}$$

Using this method to solve for flowrates, the AB leakage flowrates F_{AB} (cfm) based on positive Auxiliary Building pressures (+ inches of water) can be estimated for use as the effluent flowrate of the unventilated Auxiliary Building (See Note 1 below). A lower air density of 0.0736 lbf/ft³ at 80 °F and a conservatively higher total leakage area, A_L of 30 sq ft has been chosen, since this results in higher effluent flowrates.

$$F_{AB}(\text{cfm}) = 72,900 \{dP(\text{in of water})\}^{1/2}$$

Note 1: When Auxiliary Building pressure can not be determined, the maximum flowrate of one exhaust fan, 67,000 cfm, is to be used as the effluent flowrate.

Appendix A (Continued)

Effluent Flowrate For Unventilated Buildings

Testing of the FB ventilation system, in various exhaust fan configurations, has shown that the normal operation of one exhaust fan at a flowrate of approximately 15,000 cfm can maintain FB building pressure at approximately -0.4" of water. This flowrate is indicative of the total leakage flowrate and the total leakage area, A_L .

Using equation 2-15 from Crane's Technical Paper #410, the total leakage area, A_L can be estimated by:

$$q_e = Y C A_L \{2g(144)dP/p\}^{1/2}$$

where the effluent flowrate in cfs, q_e is 15,000/60. The values of Y and C have been chosen for a diameter ratio of 0.2 for an orifice. dP is the building pressure, and p is the air density. $Y=1$ and $C=0.6$, and the air density of 0.0764 lbf/ft³ at 60 °F are taken from Crane's Technical Paper. The building pressure is assumed to be -0.4" of water = 0.01445 psi. Substituting these values into the above equation yields:

$$15000/60 = (1)(0.6)(A_L) \{2(32.2)(144)0.01445 \text{ psi}/0.0764\}^{1/2}$$

$$A_L = 9.95 \text{ sq ft}$$

Using this method to solve for flowrates, the FB leakage flowrates F_{FB} (cfm) based on positive Fuel Building pressures (+ inches of water) can be estimated for use as the effluent flowrate of the unventilated Fuel Building (See Note 2 below). A lower air density of 0.0736 lbf/ft³ at 80 °F and a conservatively higher total leakage area, A_L of 10 sq ft has been chosen, since this results in higher effluent flowrates.

$$F_{FB}(\text{cfm}) = 24,300 \{dP(\text{in of water})\}^{1/2}$$

Note 2: When Fuel Building pressure can not be determined, the maximum flowrate of the exhaust fan, 15,000 cfm, is to be used as the effluent flowrate.

November 1, 2002

OSR 002/2002

To: Art Daniels
Decommissioning Plant Manager

Subject: Qualified Technical Review of the revisions to the Offsite Dose Calculation Manual (ODCM)

Pursuant to ODCM Section 12.7.3 and Technical Specifications 5.6.1 and 5.9.1, the following provides the basis for revisions to the ODCM and documentation of the Qualified Technical Review. Section 12.7.3 of the ODCM requires a Technical Review for revisions to the ODCM.

This review will be performed by at least two individuals with the appropriate ANSI disciplines and approved by the Decommissioned Plant Manager, thereby satisfying the requirements of the Qualified Technical Review.

Prepared by


Ron Schuster

11-1-2002
Date

Station Review:

Disciplines Required: A, B, D, G

R. Sims D & F 11-1-2002
Signature Discipline Date

J. R. [unclear] ABCG 11-1-02
Signature Discipline Date

Reggie [unclear] D & F 11-4-02
Signature Discipline Date

Signature Discipline Date

I concur and approve: [Signature] 11/4/02
Art Daniels Date
Decommissioning Manager
Zion Station

Distribution:

- Decommissioning Manager
- Operations/Eng Manager
- RadChem Manager
- Regulatory Assurance
- Admin./Training Supervisor
- SRC Coordinator
- Master File
- Preparer

November 1, 2002

Subject: Discussion of changes to the Offsite Dose Calculation Manual (ODCM)

In the monitoring of the gaseous effluents from Zion Station there are several pieces of equipment used to support the process. The equipment is listed in Chapter 12 of the ODCM. Along with this equipment are the requirements needed to declare the equipment operable and the compensatory measure required if the equipment does not meet the criteria of operability.

The changes being made to the ODCM are to add clarity to the actions needed to fulfill the requirements of the compensatory measures and will not adversely impact the accuracy or reliability of the program.

The following is a summation of the changes made and the explanation of why the changes were made.

In Chapter 12 Table 12.2-3 Surveillance 8 the words "With the number channels OPERABLE less than the minimum required" has been removed. This piece of equipment is a panel and there are no channels associated. The panel is either Operable or out of service. The following statement was added to Surveillance 8 "Restore the inoperable panel to OPERABLE status within 30 days OR conduct a station review to determine a plan to restore the panel to OPEARABLE status." This statement adds a time frame in which equipment should be returned to service.

In Chapter 12 Table 12.2-3 Surveillance 10 the words added were "for the case when the associated LP-084 panel is inoperable, continuous sampling is maintained with a portable pump and Operations performs a Channel Check Daily. Compensatory sampling does not return the monitor to an OPERABLE status." If the station can maintain sample flow to the Rad Monitor without the use of the 1 or 2 LP084 panel, the station has the opportunity to monitor the effluent pathway at all times which is the desired mode. This statement also clarifies that the station must take an action to return the equipment back in service.

In Chapter 12 Table 12.2-3 Surveillance 11 the words added were " For the case when the associated LP-084 panel is inoperable, continuous sampling can be maintained with a portable pump and Operations shall perform a Channel Check Daily. Compensatory sampling does not return the monitor to an OPERABLE status." If the station can maintain sample flow to the Rad Monitor without the use of the 1 or 2 LP084 panel, the station has the opportunity to monitor the effluent pathway at all times which is the desired mode. This statement also clarifies that the station must take an action to return the equipment back in service.

These changes to the ODCM add clarifying statements to the compensatory actions required. The station has changed the process in which compensatory measures have historically been taken. The use of a portable vacuum pump to maintain the sample flow to the rad monitor, in lieu of taking grab samples, has been previously reviewed and approved within Zion Radiation Protection procedures. Supporting ZRP procedures give the station guidance on the requirements needed to be fulfilled to comply with the ODCM. These changes

are being made so that the station has one document to reference and a single source to interpret the compensatory measures that need to be taken.

Revision Summary

Table 12.2-3

Rev 8	Rev 9
<p>Surveillance 8- With the number of channels OPERABLE less than the minimum number required, effluent releases via this pathway may continue provided the flow rate is estimated at least once per day while release is in progress.</p>	<p>Surveillance 8- Effluent releases via this pathway may continue provided the effluent flow rate is estimated at least once per day while a release is in progress. Restore the inoperable panel to OPERABLE status within 30 days OR conduct a station review to determine a plan of action to restore the panel to OPERABLE status.</p>
<p>Surveillance 10- With the number of OPERABLE channels less than the minimum number required, restore the channel to OPERABLE status within 30 days or conduct a station review to determine a plan of action to restore the channel to OPERABLE status. Effluent releases via this way may continue provided grab samples are obtained and analyzed for gross activity at least once per day</p>	<p>Surveillance 10- With the number of OPERABLE channels less than the minimum number required, restore the channel to OPERABLE status within 30 days or conduct a station review to determine a plan of action to restore the channel to OPERABLE status. Effluent releases via this pathway may continue provided grab samples are obtained and analyzed for gross activity at least once per day. OR for the case when the associated LP-084 panel is inoperable, continuous sampling is maintained with a portable pump and Operations performs a Channel Check Daily. Compensatory sampling does not return the monitor to an OPERABLE status.</p>
<p>Surveillance 11 - With the number of OPERABLE channels less than the minimum number required, restore the channel to OPERABLE status within 30 days or conduct a station review to determine a plan of action to restore the channel to OPERABLE status. Effluent release via this pathway may continue provided grab samples are continuously collected as required in Table 12.4-1</p>	<p>Surveillance 11- With the number of OPERABLE channels less than the minimum number required, restore the channel to OPERABLE status within 30 days or conduct a station review to determine a plan of action to restore the channel to OPERABLE status. Effluent releases via this pathway may continue provided samples are continuously collected as required in Table 12.4-1. For the case when the associated LP-084 panel is inoperable, continuous sampling can be maintained with a portable pump and Operations shall perform a Channel Check Daily. Compensatory sampling does not return the monitor to an OPERABLE status.</p>

Table of Contents

Page or Section

Change Description

Cover Page

Replaced ComEd logo with Exelon Nuclear logo.

Table of Contents

Updated table of contents to reflect changes to generic section of ODCM.

Chapter 1

Page or Section

Change Description

Page 1

Added "INTRODUCTION" to chapter heading.

1.0

Last paragraph. Changed "ComEd" to "Exelon Nuclear"

1.1

Revised first sentence of first paragraph to read: "The manual is the ODCM for the following Exelon Nuclear power stations: Braidwood, Byron, Dresden, LaSalle, Quad Cities and Zion."

Second paragraph. Changed "ComEd" to "Exelon Nuclear"

Revised second sentence in second paragraph to read: "Appendices A and B provide detailed information on specific aspects of the methodology."

Chapter 2

Page or Section

Change Description

2.0

Editorial revision. Changed "CFR" to read " Code of Federal Regulations (CFR)"

2.1.4

Changed "whole body" to "total body"

2.1.5

Changed "whole body" to "total body"

Changed "ComEd" to "Exelon Nuclear"

Editorial revision. Changed "calculational" to "calculation" in last sentence of last paragraph.

2.4

Changed "whole body" to "total body"

Added "(or TEDE)" to first paragraph.

2.5

Revised section to indicate that dose methodology is based upon maximum individual concept of Regulatory Guide 1.109 and NUREG 0133. Clarified location of dose receptor based upon NUREG 0133.

Table 2-1

Revised references to equation numbers.

Added footnote 4 to explanation of Total Effective Dose Equivalent.

Changed "whole body" to "total body"

Changed "ComEd" to "Exelon Nuclear" in footnote 2.

Table 2-2

Clarified reference to Table F-8.

Deleted reference to direct dose from radioactivity deposited on the ground.

Added reference to dose due to radioiodines, tritium and particulates with half-lives greater than 8 days for inhalation, ingestion of vegetation, milk and meat, and ground plane exposure pathways.

Deleted reference to receiver at unrestricted area boundary location with highest D/Q.

Defined dose receptor in accordance with methodology of NUREG 0133.

Deleted reference to Total Effective Dose Equivalent replacing it with Total Dose.

Added: "Note it may also be necessary to address dose from on-site activity by members of the public."

Deleted footnote 1.

Table 2-3

Revised to reflect new equation and section numbers.

Changed "whole body" to "total body"

Deleted reference to 10CFR20 requirement for instantaneous dose rate limits from airborne radioactivity and added reference to RETS.
 Revised footnote 1 to include all groups for 10CFR20 and 40CFR190 compliance assessment.
 Deleted reference to FGR 11 in footnote 1.
 Added footnote 4 to explanation of Total Effective Dose Equivalent.
 Changed receptor from "Adult" to "Child" for Non-Noble Gas Inhalation dose rate.
 Changed "whole body" to "total body"
 Revised references to new section numbers.
 Changed "Leafy Vegetables" to "Vegetation"
 Deleted reference to "Produce"
 Revised footnote c to reflect changes in location of dose receptor.
 Changed "ComEd" to "Exelon Nuclear" in footnote 2.

Figure 2-1

Chapter 3

Page or Section

Change Description

3.1 Deleted reference to Figure 3-1.
 Changed "Radiation from radioactivity airborne..." to read, "External Radiation from radioactivity airborne..."
 Changed "Radiation from radioactivity deposited..." to read, "External Radiation from radioactivity deposited..."
 Deleted references to "transfer of radioactivity deposited on the soil" for vegetation and animal food products.
 Delete last paragraph and added statement: "Dose for airborne releases is assessed at the location in the unrestricted area where the combination of existing pathways and receptor age groups indicates the maximum potential exposures."

3.2 Delete references to the following pathways: direct exposure, shoreline exposure, vegetation irrigation and animal food product irrigation.

Figure 3-1 Changed "ComEd" to "Exelon Nuclear"
 Revised Figure 3-1 to reflect NUREG 0133 pathways.

Chapter 4

Page or Section

Change Description

4.0 Changed "ComEd" to "Exelon Nuclear"
 4 1.1 Deleted, "and Dose Commitment" from section title.
 Deleted last sentence of first paragraph.
 Changed first sentence of second paragraph to read "Internal exposure occurs when the source of radioactivity is inside the body"
 Editorial change, second paragraph. Changed "eating" to "consumption of"
 Deleted definition of ingested activity.
 Added paragraph to define dose as used by Regulatory Guide 1.109
 4 1.2 Editorial revision. Changed "...deposited the radioactivity on vegetation" to read "deposited radioactivity on vegetation."
 Changed notation for "N¹⁶" to "¹⁶N."
 4 1.3 Changed "ComEd" to "Exelon Nuclear"
 Editorial revision. Changed "where-as" to "whereas".
 Editorial revision. Deleted "(Ci)" in second paragraph.
 4 1.4 Revised first paragraph to read: " The dose impact from airborne release of radioactivity, is determined by the height of the release of the effluent plume relative to the ground and by the location of the dose recipient "

- 4.1.5 Changed second paragraph from, "It has been found that the height an ..." to read "The height an..."
Changed "ComEd" to "Exelon Nuclear".
Changed "X/Q" to " χ/Q ".
Added reference to "gamma- χ/Q ".
Deleted reference to Gamma Air Dose Factor.
Deleted reference to Whole Body Dose Factor.
Changed first sentence of last paragraph to read, "The bases sections of the Standard Radiological Effluent Technical Specifications (guidance documents NUREGs 0472, 0473, 1301 and 1302)..."
- 4.1.6 Changed "X/Q" to " χ/Q ".
Added reference to "gamma- χ/Q ".
Added verbal definition of gamma- χ/Q .
Changed "methodology" to "methodologies" in last paragraph.
- 4.1.7 Changed "X/Q" to " χ/Q ".
Changed "ComEd" to "Exelon Nuclear"
- 4.2.1 Added discussion of how gamma- χ/Q impacts assessment of gamma air dose.
Revised definition of Finite Cloud Gamma Air Dose Factor to be consistent with that of Regulatory Guide 1.109 and the use of gamma- χ/Q .
Revised definition of Semi-Infinite Cloud Gamma Air Dose Factor to be consistent the use of gamma- χ/Q .
- 4.2.1.1 Changed section title from "The Gamma Air Dose Factor" to "Finite Cloud Gamma Air Dose Factor"
Revised definition of Semi-Infinite Cloud Gamma Air Dose Factor to be consistent the use of gamma- χ/Q .
- 4.2.2 Changed first sentence of first paragraph to read: " The term 'beta air dose' refers to the component of dose absorbed by air resulting from the absorption of energy from emissions of beta particles..."
Revised definition of Beta Air Dose Factor to be consistent with that of Regulatory Guide 1.109
- 4.2.3 Revised wording referring to "Whole Body" to read "Total Body" to be consistent with that of Regulatory Guide 1.109 and NUREG 0133.
Deleted references to deep dose equivalent and DDE
Revised references to equation numbers.
Revised definition of Whole Body Dose Factor (now Total Body Dose Factor) to be consistent with that of Regulatory Guide 1.109 and NUREG 0133
- 4.2.4 Deleted reference to shallow dose equivalent and SDE.
Revised references to equation numbers
Revised definition of Skin Dose Factor to be consistent with that of Regulatory Guide 1.109 and NUREG 0133
- 4.2.5 Changed "whole body" to "total body"
Deleted reference to deep dose equivalent.
Revised wording referring to "Whole Body" to read "Total Body "
Revised references to equation numbers
- 4.2.6 Editorial revision. Deleted last two sentences of last paragraph
Replaced wording of "Dose Commitment" with "Dose".
Deleted reference to C-14
Revised references to equation numbers.
Deleted reference to committed dose equivalent and CDE.
Revised definition of Inhalation Dose Factor to be consistent with that of Regulatory Guide 1.109 and NUREG 0133
- 4.2.7 Changed receptor age group from "Adult" to "Child."
Replaced reference to "Leafy Vegetables" with "Vegetables "
Deleted reference to "Produce"

- 4.3 Deleted reference to absorption by vegetation.
 Changed "ComEd" to "Exelon Nuclear"
 Editorial revision. Replaced "Milk, and" with "Milk"
 Revised references to equation numbers.
 Deleted reference to FDR 11.
 Changed last sentence of section to read: "The equations used for radioactivity concentration on vegetation and in milk and meat are discussed in Appendix A."
 Changed "ComEd" to "Exelon Nuclear"
 Deleted reference to dose rate.
 Changed "bio-accumulation" to "bioaccumulation."
 In first paragraph changed wording "principal pathways" to "pathways."
 In first paragraph changed wording, "from both the drinking water" to "from the drinking water."
 Revised references to equation numbers.
 Revised wording to reflect change from Regulatory Guide 1.109 to NUREG 0133 dose calculation methodology.
- 4.4 Changed "rad" to "radioactive" in last sentence of last paragraph.
- 4.4.1 Changed notation for "N¹⁶" to "¹⁶N."
- 4.4.2 Revised references to equation numbers.
 Editorial revision: Changed "Low level" to "Low-level" in first sentence of first paragraph.
 Changed "ComEd" to "Exelon Nuclear"
 Editorial revision: changed "In addition Rad Material may be stored on site:" to read, "Rad Material may be stored on site."
 Added reference to ISFSI facilities.
- 4.5 Revised to address details of how 10CFR20 compliance will be demonstrated
 Reference to TEDE was deleted.
- 4.6 Changed notation for "N¹⁶" to "¹⁶N."
- Table 4-1 Deleted reference to C-14.
 Deleted footnote 1.
- Table 4-2 Revised to reflect changes in footnotes.
 Changed "Whole Body" to "Total Body"
 Changed units for whole body (now total body) dose factor from "mrad/yr per $\mu\text{Ci}/\text{m}^3$ " to "mrem/yr per $\mu\text{Ci}/\text{m}^3$ "
 Changed Name and Symbol for ground plane to "Ground Plane Dose Conversion Factor"
 Deleted references to S_i, V_i and G_i.
 Revised references to equation numbers.
 Revised units for Gamma Air Dose Factors.
 Deleted Inhalation Dose Commitment Factor reference to FGR 11
 Deleted Ingestion Dose Commitment Factor reference to FGR 11
 Deleted reference to FRG 11 from table Note 1

Chapter 5
Page or Section

Change Description

- 5.2 Changed "station's" to "stations' "
 Changed "ComEd" to "Exelon Nuclear"

Chapter 6
Page or Section

Change Description

- 6.1 Changed third sentence of first paragraph to read, "These date are used. . ."
 Deleted last paragraph.

6.3 Changed reference to "GSRPD" to "corporate"
 6.4 Deleted

Chapter 7

Page or Section Change Description

Reference 93 Deleted
 Reference 104 Added: " Federal Register, Vol. 56, No. 98, Tuesday, May 21, 1991, page 23374, column 3."
 Reference 105 Added: " U.S. Nuclear Regulatory Commission, Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors, NUREG-1301, April 1991."
 Reference 106 Added: " U.S. Nuclear Regulatory Commission, Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors, NUREG-1302, April 1991."
 Reference 107: Added: " U.S. Nuclear Regulatory Commission, LADTAP II - Technical Reference and Users Guide, NUREG-4013, April 1986."

Appendix A

Page or Section Change Description

Table of Contents Updated table of contents to reflect changes to Appendix A.

A.0 Revised "These factors, X/Q and D/Q are defined..." to read, "These atmospheric dispersion and deposition factors..."
 Reworded to remove references to meteorologically based dose factors.
 Deleted fifth paragraph and added the statement, "This section of the ODCM provides the methodological details for demonstrating compliance with the 10CFR20, 10CFR50 Appendix I and 40CFR190 radiological limits for liquid and gaseous effluents."

A.1.2.1 Revised section to reflect change to NUREG 0133 and gamma- χ /Q methodology.
 Clarified location of calculation for gamma air dose.

A.1.2.2 Revised section to reflect change to NUREG 0133 methodology.
 Clarified location of calculation for beta air dose.

A.1.2.3 Revised section to reflect change to NUREG 0133 and gamma- χ /Q methodology.
 Changed "whole body" to "total body."
 Clarified location of calculation for total body noble gas dose

A.1.2.4 Revised section to reflect change to NUREG 0133 and gamma- χ /Q methodology.
 Clarified location of calculation for skin noble gas dose.

A.1.3.1 Revised section to reflect change to NUREG 0133 and gamma- χ /Q methodology
 Deleted references to deep dose equivalent.
 Changed "whole body" to "total body."

A.1.3.2 Revised section to reflect change to NUREG 0133 and gamma- χ /Q methodology
 Deleted reference to "shallow dose equivalent rate"

A.1.4 Revised to reflect change to NUREG 0133 methodology.
 Added paragraph to define dose as used by Regulatory Guide 1.109.
 Clarified location of calculation for dose due to non-noble gas radionuclides.

A.1.4.1 Revised to reflect change to NUREG 0133 methodology.
 Changed "whole body" to "total body"

Change Summary
ODCM, Generic Section
Revision 3

- A.1.4.2 Revised to reflect change to NUREG 0133 methodology.
- A.1.4.3 Revised to reflect change to NUREG 0133 methodology.
- A.1.4.3.1 Revised to reflect change to NUREG 0133 methodology.
- A.1.4.3.2 Revised to reflect change to NUREG 0133 methodology.
- A.1.4.3.3 Revised to reflect change to NUREG 0133 methodology.
- A.1.5 Revised to reflect change to NUREG 0133 methodology.
Changed age group typically considered as dose rate receptor from adult to child in accordance with guidance in NUREGs 0472, 0473, 1301 and 1302.
- A.1.6 Deleted last paragraph of "Requirements"
Revised equation numbers.
- A.2 Deleted references to dose commitment.
Deleted references to FRG 11.
Revised to reflect change to NUREG 0133 methodology.
- A.2.1.1 Added section for potable water pathway dose factors.
- A.2.1.2 Added section for fish ingestion pathway dose factors
- A.2.2 Editorial revision: changed format of Equation A-21.
Editorial revision: changed "over index I (radionuclides)." to read "oved radionuclides i."
Editorial revision: changed "mL" to "ml"
Deleted wording "(if approved)" in definition of Tech Spec Multiplier.
Revised equation numbers.
- A.2.3 Editorial revision: changed "mL" to "ml"
Revised Equation A-22 to reflect terminology of Equation 18.
Revised definition of dilution flow to be consistent with NUREG 0133.
- A.2.5 Changed "whole body" to "total body."
Revised equation numbers.
Changed wording in last paragraph from, "Projected radionuclide releases are used in placed of measured releases, A_i," to read, "Projected radionuclide release concentrations are used in placed of measured concentration, C_i."
- A.3 Changed "ComEd" to "Exelon Nuclear"
Changed notation for "N¹⁶⁻" to "¹⁶N."
Added "(boiling water reactor)"
Chanced reference to "whole body" to "total body."
Deleted references to deep dose equivalent.
- A.3.1 Changed "ComEd" to "Exelon Nuclear"
Changed notation for "N¹⁶⁻" to "¹⁶N."
Changed notation for "O¹⁶⁻" to "¹⁶O."
Editorial revision: Reworded paragraph 4.
Editorial revision: changed format of Equation A-23.
Deleted references to deep dose equivalent.
Added bullet: "Independent Spent Fuel Storage Installation (ISFSI) facilities"
Deleted next-to-last paragraph.
Revised equation numbers.
- A.3.2 Changed "ComEd" to "Exelon Nuclear"
- A.4 Section reworded to reflect change to NUREG 0133 methodology
Section reworded to reflect compliance with 10CFR20 to be based upon compliance with 40CFR190
- A.4.1 Changed title of section to "External Total Body Dose"
Deleted references to deep dose equivalent.
Deleted item 3 following first paragraph and incorporated into item 2.
Changed references to "whole body" to "total body"
- A.4.2 Deleted.
- A.4.3 Deleted.

Change Summary
 ODCM, Generic Section
 Revision 3

A.5.1	Section reworded to reflect compliance with 10CFR20 to be based upon compliance with 40CFR190.
A.5.1.1	Deleted 2 nd paragraph.
A.5.1.2	Section reworded to reflect compliance with 10CFR20 to be based upon compliance with 40CFR190.
A.5.2	Editorial revision: Changed "The calculation of compliance to 40CFR190 regulations is now required as part of demonstration of compliance to 10CFR290 regulations." to read, "Compliance with the 40CFR190 regulations is now required as part of demonstration of compliance with 10CFR20 regulations per 10CFR20.1301(d)." Revised equation numbers.
A.6.1	Added wording. "(not verbatim)"
A.6.2	Changed "radionuclides" to "radionuclide" in second sentence of first paragraph. Revised equation numbers.
Table A-1	Deleted references to CDE. Deleted references to TEDE. Added wording to reflect compliance with 10CFR20 to be based upon compliance with 40CFR190. Changed "whole body" to "total body." Added the wording: "instantaneous' noble gas total body and skin dose rates and radioiodine, tritium and particulate inhalation dose rates to a child due to radioactivity in airborne effluents." Deleted first sentence of footnote 1.
Table A-2	Revised Table to include "Chemical Cleaning" and "Vent (Mixed Mode)" for Dresden 1.
Table A-4	Revised equation numbers. Changed references to "whole body" to "total body." Changed wording, "Deep Dose Equivalent" to "Total Body Dose." Changed wording, "Committed Dose Equivalent" to "Organ Dose" Added table note 1c. Deleted table note 2.

Appendix B
Page or Section

Change Description

Table of Contents	Updated table of contents to reflect changes to Appendix B
B 0	Added reference to gamma- χ /Q. Deleted references to meteorologically dependent dose factors Changed wording in last paragraph from, "Most of these equations " to "These equations..." Revised section numbers.
B.2.1	Changed "X" to " χ "
B.2.2	Changed "X" to " χ "
B 3	Changed first sentence of first paragraph to read, "...provides a simplified method of calculating..." Changed "X" to " χ "
B.3.1	Changed "X" to " χ "
B.3.2	Changed "X" to " χ "
B.3.3	Changed "X" to " χ "
B.3.4	Deleted last sentence of 1 st paragraph. Changed "X" to " χ "
B.3.5	Added section to address to gamma- χ /Q methodology.

Change Summary
 ODCM, Generic Section
 Revision 3

- B.5.1 Revised equation numbers.
- B.5.2 Deleted last two sentences of last paragraph.
- B.6 Renamed "Whole Body Dose Factors" to "Gamma Total Body Dose Conversion Factor"
 Changed wording from "whole body" to "total body"
 Revised definition of dose factor in this section to correspond to NUREG 0133 methodology.
- B.6.1 Deleted
- B.6.2 Deleted
- B.6.3 Deleted
- B.7 Editorial revision: Changed title from "BETA AIR AND SKIN DOSE FACTORS" to read, "BETA AIR AND BETA SKIN DOSE CONVERSION FACTORS"
 Revised definition of dose factors in this section to correspond to NUREG 0133 methodology.
- B.8 Revised equation numbers.
- B.9 Revised equation numbers.
 Editorial revision: Changed "(mrem per (pCi inhaled))" to "mrem per pCi inhaled"
 Deleted last paragraph.
- B.10 Changed ingestion dose commitment factor from "DFA₁₀" to "DFL₁₀" to be consistent with the notation of Appendix A.
- B.14 Deleted reference to radiological decay constants.
- B.15.1 Revised section to reflect change to NUREG 0133 methodology.
- B.15.2 Revised section to reflect change to NUREG 0133 methodology.
- B.15.3.1 Revised section to reflect change to NUREG 0133 methodology.
- B.15.3.1.1 Deleted references to radioactive decay in transit.
- B.15.3.1.2 Revised section to reflect change to NUREG 0133 methodology.
 Deleted references to radioactive decay in transit.
- B.15.3.2 Revised equation numbers.
 Changed ingestion dose commitment factor from "DFI₁₀" to "DFL₁₀" to be consistent with the notation of Appendix A.
 Deleted last paragraph to remove references to FGR 11 and radioactive decay in transit.
- B.15.3.3 Changed "A," to "C," to be consistent with notation of Appendix A
- B.15.3.4 Deleted.
- B.15.3.5 Renumbered.
- B.15 Revised equation numbers.
 Changed "U_w" and "U₁₀" to "U_s" and "U_s" to be consistent with notation of Appendix A.
- B.15 Revised equation numbers.
 Revised Equation A-22 to match Appendix A.
- Table B-0 Added table of Noble Gas Nuclide Fractions.
- Figure B-5 Deleted.
- Figure B-6 Deleted.

Appendix C
Page or Section

Change Description

- Table of Contents Updated table of contents to reflect changes to Appendix C.
- C Deleted reference to section C.3.
- C.2 Added reference to NUREG 4013 for H-3 dose factors
- C.3 Deleted.
- Table C-1 Revised equation numbers.

Change Summary
ODCM, Generic Section
Revision 3

	Revised to reflect change to NUREG 0133 methodology
	Deleted Basis Key "B"
	Changed t_b from 20 years to 30 years.
	Revised footnote C to read: " The parameter t_b is taken as the midpoint of plant operating life (based upon an assumed 60 year plant operating lifetime)."
Table C-2	Revised terms in Variable column to reflect notation of Appendix A.
Table C-3	Changed reference to " F_E " to " F_i " to be consistent with notation of Appendix A.
Table C-7	Changed nuclide abbreviation notation from "XX" to "Xx" (e.g. "BE" changed to "Be")
Table C-8	Changed reference to "B," to "BF," to be consistent with notation of Appendix A.
Table C-9	Revised to reflect change to NUREG 0133 methodology.
Table C-10	Deleted reference to FGR 11 in table note.

<u>Page or Section</u>	<u>Change Description</u>
General Document	Changed revision number and data.
Table of Contents	Updated table of contents to reflect changes to Appendix O of ODCM.
List of Tables	Changed "ComEd" to Exelon"
O.3.1	Revised to reflect changes from Reg. Guide 1.109 to NUREG 0133 methodology.
O.3.2	Revised to reflect changes from Reg. Guide 1.109 to NUREG 0133 methodology Changed wording in first sentence of third paragraph from: "The selection of liquid pathways evaluated was based on.. " to read: "The liquid pathways were evaluated based on..."
O.3.3	Changed "whole body" to "total body" in fifth paragraph.
O.4.1	Revised definition of time factors to agree with that of NUREG 0133, Section 2.2.
O.4.2	Corrected Reg. Guide 1.111 Section reference.
O.4.3	Corrected reference number.
O.6	Changed: "ComEd's" to "Exelon's"
O.7.1	Corrected Reg. Guide 1.109 Section reference. Corrected Reg. Guide 1.111 Section reference.
O.7.3	Corrected Reg Guide 1.111 Section reference in first and second paragraph.
O.7.4	Corrected Reg Guide 1.109 Section reference. Corrected Reg. Guide 1.111 Section reference. Changed "X/Q" to " χ/Q " Changed "whole body" to "total body"
O 7 5	Changed "X" to " χ "
O 7 6	Changed "X/Q" to " χ/Q "
O 7 6 1	Changed "(X/Q),s" to " $(\chi/Q),s$ "
O 7 6 2	Changed "(X/Q),g" to " $(\chi/Q),g$ "
O 7 6 3	Changed wording in first sentence from: "Equation B-29 of Appendix B is the formula for calculating..." to read: "Equation B-29 of Appendix B may be used for calculating..." Changed " $(X/Q),v$ " to " $(\chi/Q),v$ " Corrected Reg Guide 1.111 Section reference
O 7 6 4	Changed "X/Q" to " χ/Q "
O 7 6 5	Added section for Gamma- χ/Q

<u>Page or Section</u>	<u>Change Description</u>
O.7.7	Revised references to equation numbers in Appendix B. Corrected Reg. Guide 1.111 Section reference.
O.7.8.1	Revised first paragraph to reflect use of gamma- χ /Q. Changed reference from Regulatory Guide 1.109 to NUREG 0133 in first and second paragraphs. Changed wording in second sentence of second paragraph from "... contains a term: representing each of the three release point..." to read: "contains terms representing the appropriate release point..." Corrected Reg. Guide 1.111 Section reference. Added reference for M, dose factors.
O.7.8.2	Revised references to equation numbers in Appendix B Corrected Reg. Guide 1.111 Section reference. Changed wording in first sentence of first paragraph from: "Equation A-1 of Appendix A involves the use of dose factors..." to read: "Calculation of gamma- χ /Q involves the use of finite plume gamma air dose factors..." Changed wording in first two sentences of third paragraph from: "As explained in Section B.5.2 of Appendix B, the gamma air dose factor for a ground level release is obtained by a slightly modified version of Equation B-36 of Appendix B. The approach corresponds to use of a finite plume model and differs from Regulatory Guide 1.109. In the regulatory guide, dose factors for a ground level release are based on a semi-infinite cloud model (see Equation 7 of Regulatory Position B.16.b)." to read: "The finite plume gamma air dose factors for a ground level release are obtained by Equation B-40 of Appendix B using the ground level joint frequency distribution data and assuming an effective release height of zero. The use of a finite plume model differs from NUREG 0133 in that ground level releases are based on a semi-infinite cloud model (see Equation 7 of Regulatory Position C.2.b)." Changed wording in second paragraph from: "The dose factor is obtained " to read: "The dose factors are obtained..."
O.7.8.3	Changed wording in second sentence of first paragraph from " the gamma air dose factors should be..." to read: "...the gamma- χ /Q values should be " Revised table reference. Changed wording in third sentence of first paragraph from " of Appendix F are unrestricted are boundary values" to read: "...of Appendix F are for the unrestricted area boundary" Changed wording in last sentence of first paragraph from " gamma air dose factors..." to read: "...gamma air dose factors used to calculate gamma- χ /Q " Changed wording in first sentence of last paragraph from: "The dose factors in the each station's..." to read: "The gamma air dose factors used to calculate gamma- χ /Q in each station's..." Changed wording in last sentence of last paragraph from: "...it is judged that a gamma air dose factor value..." to read: "it is judged that a gamma- χ /Q value "
O 7 9	Changed reference from Regulatory Guide 1.109 to NUREG 0133 Corrected Reg. Guide 1.111 Section reference. Changed dose factor "L," to "N,".

<u>Page or Section</u>	<u>Change Description</u>
O.7.10	<p>Changed "Whole body" to "Total body" in first paragraph. Revised references to equation numbers in Appendix A in first paragraph Corrected Reg. Guide 1.111 Section reference in first paragraph. Changed reference from Regulatory Guide 1.109 to NUREG 0133 in first paragraph. Added sentence: "The dose factors K_i used in Equation A-3 of Appendix A are identical to the beta air dose factors DF_{Bi} specified in Table B-1 of Regulatory Guide 1.109." in first paragraph. Deleted rest of section.</p>
O.7.11	<p>Revised references to equation numbers in Appendix A. Changed reference from Regulatory Guide 1.109 to NUREG 0133. Corrected Reg. Guide 1.111 Section reference. Changed wording in last sentence of first paragraph from: " The dose factors L_i used in Equation A-7 of Appendix A are identical to the beta skin dose..." to read " The dose factors L_i and M_i used in Equation A-4 of Appendix A are identical to the gamma and beta skin dose..." Changed wording in first sentence of last paragraph from: "... calculated with the same dose factors as used in Equation..." to read: "...calculated with gamma-χ/Q in the same manner as that of Equation..." Changed wording in the second sentence of the last paragraph from: "...contribution due to ground level releases" to read: "...contribution to the skin due to gamma emissions..." Deleted last sentence of last paragraph.</p>
O.7.12	<p>Changed "Whole body" to "Total body" Revised references to equation numbers in Appendix A.</p>
O.7.13	<p>Revised references to equation numbers in Appendix A.</p>
O.7.14	<p>Revised references to equation numbers in Appendix A. Changed reference from Regulatory Guide 1.109 to NUREG 0133.</p>
O.7.15	<p>Revised references to equation numbers in Appendix A. Deleted second and third sentence of first paragraph and added: " The methodology is based upon Sections 5.3.1 and 5.3.1.2 of NUREG 0133" Changed wording in last sentence of last paragraph from: "...of R.G. 1.109 " to read: "...of Regulatory Guide 1.109 and Section 5.3.1.2 of NUREG 0133."</p>
O.7.16	<p>Revised references to equation numbers in Appendix A. Changed wording in first paragraph from: "It is based on Equations 13 and C-3 of Regulatory Guide 1.109 except that the relative concentration factor, X/Q, depends on whether the release point is elevated, vent, or ground level. This is done for conformance with Regulatory Position B.16.b of Regulatory Guide 1.111." to read: "This equation is explained in Section 4.2.6. It is based on Sections 5.3.1 and 5.3.1.1 of NUREG 0133." Deleted last sentence of first paragraph.</p>

Page or Section

Change Description

O.7.17

Revised references to equation numbers in Appendix A.
Changed wording in third sentence of first paragraph from: " They are similar to Equations 14 and C-5 through C-13 of Regulatory Guide 1.109 except as follows:" to read: " They are based the methodology found in Sections 5.3.1.3 through 5.3.1.5 of NUREG 0133."
Deleted bulleted paragraphs.
Deleted second sentence of last paragraph.
Deleted last bulleted paragraph.

O.7.18

Revised references to equation numbers in Appendix A.

O.8.1

Revised references to equation numbers in Appendix A.
Changed wording in second sentence of first paragraph from: "The total dose is the sum..." to read: "The dose is based upon the sum..."
Deleted second paragraph and the bulleted paragraphs that followed.
Added reference to dilution factors "Z" and "D"
Deleted last paragraph.

O.8.2

Revised references to equation numbers in Appendix A.

O.9.1

Revised references to equation numbers in Appendix A.

April 15, 2003

Subject is the submittal of the annual effluent report.

The material for the Zion Annual Effluent Report that is contained in this package is not complete. Omitted from this copy are the current ODCM. All other data has been included in this copy. A copy of the current ODCM has been provided to the regulators.

The reason that this manual were left out of this copy is the size of the manual are in excess of 4 inches tall and would make this copy of the report very cumbersome to ship and handle

If a copy of the manual are required please contact central file at Zion Station and they will insure that a copy of the current ODCM is provided.

If there are any questions or concerns please contact Ron Schuster at 847-746-2084 extension 2700.