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## Byron 1 – Quarterly Performance Indicators

### 3Q/2017 Performance Indicators

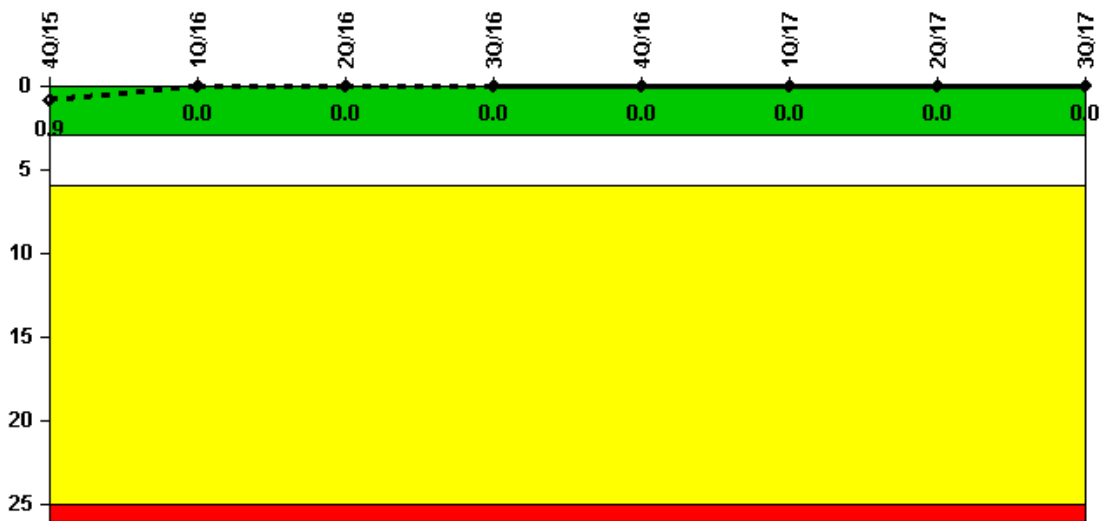
The solid trend line represents the current reporting period.

Licensee's General Comments: Byron Station Unit 1 3Q2017

On this page:

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- Unplanned Power Changes per 7000 Critical Hours (IE03)
- Unplanned Scrams with Complications (IE04)
- Safety System Functional Failures (MS05)
- Emergency AC Power Systems (MS06)
- High Pressure Injection Systems (MS07)
- Heat Removal Systems (MS08)
- Residual Heat Removal Systems (MS09)
- Cooling Water Systems (MS10)
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- Reactor Coolant System Leakage (BI02)
- Drill/Exercise Performance (EP01)
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- Protected Area Equipment (PP01)

### Unplanned Scrams per 7000 Critical Hrs



Thresholds: White > 3.0 Yellow > 6.0 Red > 25.0

**Notes**

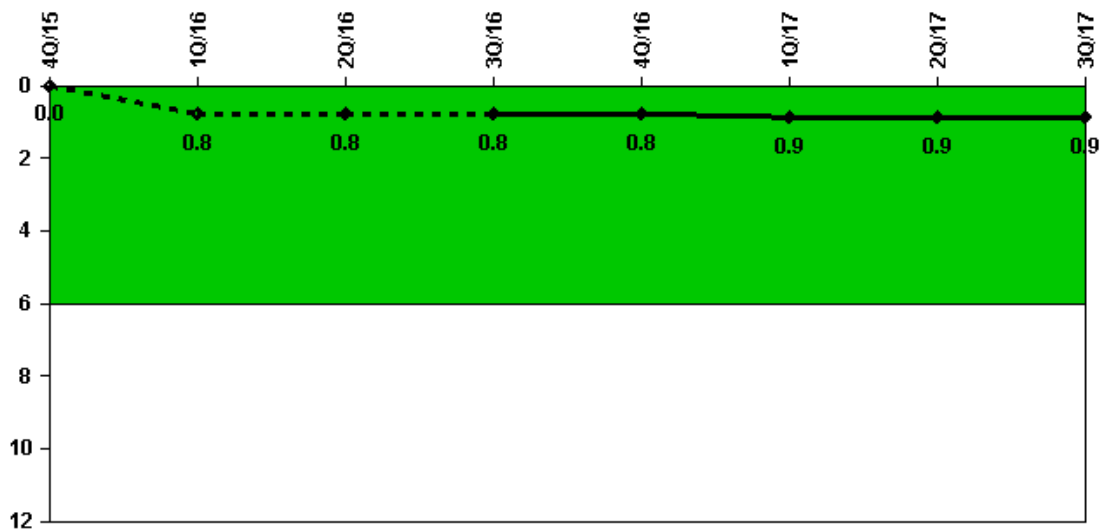
Unplanned Scrams per 7000 Critical Hrs	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Unplanned scrams	0	0	0	0	0	0	0	0
Critical hours	2184.2	2183.0	2184.0	2208.0	2209.0	1509.1	2184.0	2208.0

Indicator value	0.9	0	0	0	0	0	0	0
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Licensee Comments: none

### Unplanned Power Changes per 7000 Critical Hrs



Thresholds: White > 6.0

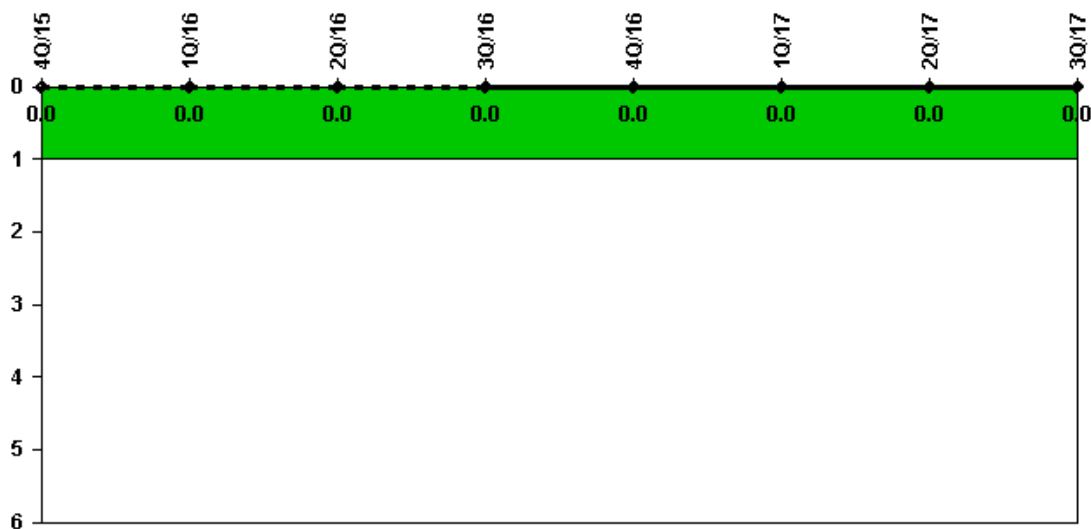
**Notes**

<b>Unplanned Power Changes per 7000 Critical Hrs</b>	<b>4Q/15</b>	<b>1Q/16</b>	<b>2Q/16</b>	<b>3Q/16</b>	<b>4Q/16</b>	<b>1Q/17</b>	<b>2Q/17</b>	<b>3Q/17</b>
Unplanned power changes	0	1.0	0	0	0	1.0	0	0
Critical hours	2184.2	2183.0	2184.0	2208.0	2209.0	1509.1	2184.0	2208.0
<b>Indicator value</b>	<b>0</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.8</b>	<b>0.9</b>	<b>0.9</b>	<b>0.9</b>

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Licensee Comments: none

**Unplanned Scrams with Complications**



Thresholds: White > 1.0

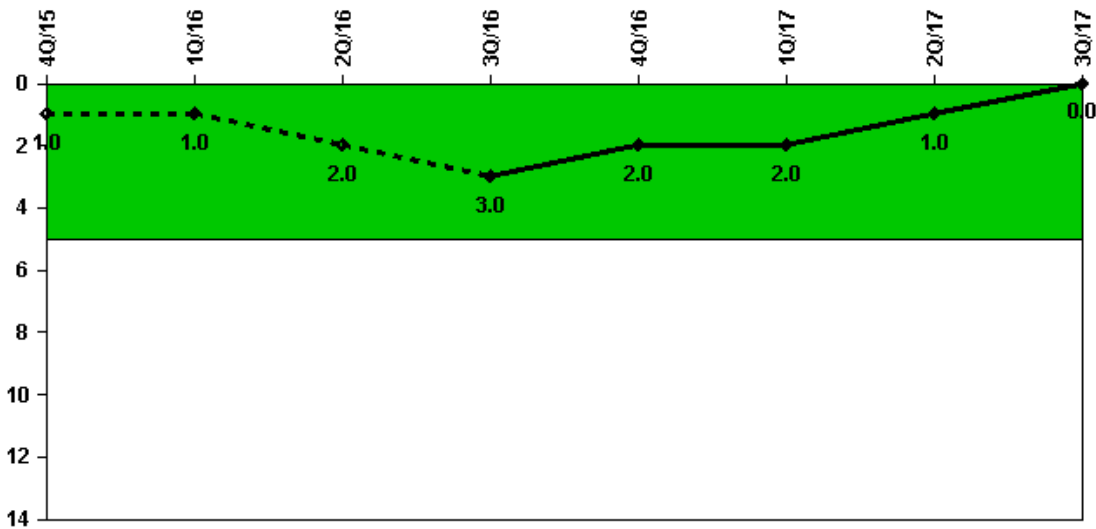
**Notes**

<b>Unplanned Scrams with Complications</b>	<b>4Q/15</b>	<b>1Q/16</b>	<b>2Q/16</b>	<b>3Q/16</b>	<b>4Q/16</b>	<b>1Q/17</b>	<b>2Q/17</b>	<b>3Q/17</b>
Scrams with complications	0	0	0	0	0	0	0	0
<b>Indicator value</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>	<b>0.0</b>

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Licensee Comments: none

### Safety System Functional Failures (PWR)



Thresholds: White > 5.0

#### Notes

#### Safety System Functional Failures (PWR) 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17

Safety System Functional Failures                      1   0   1   1   0   0   0   0

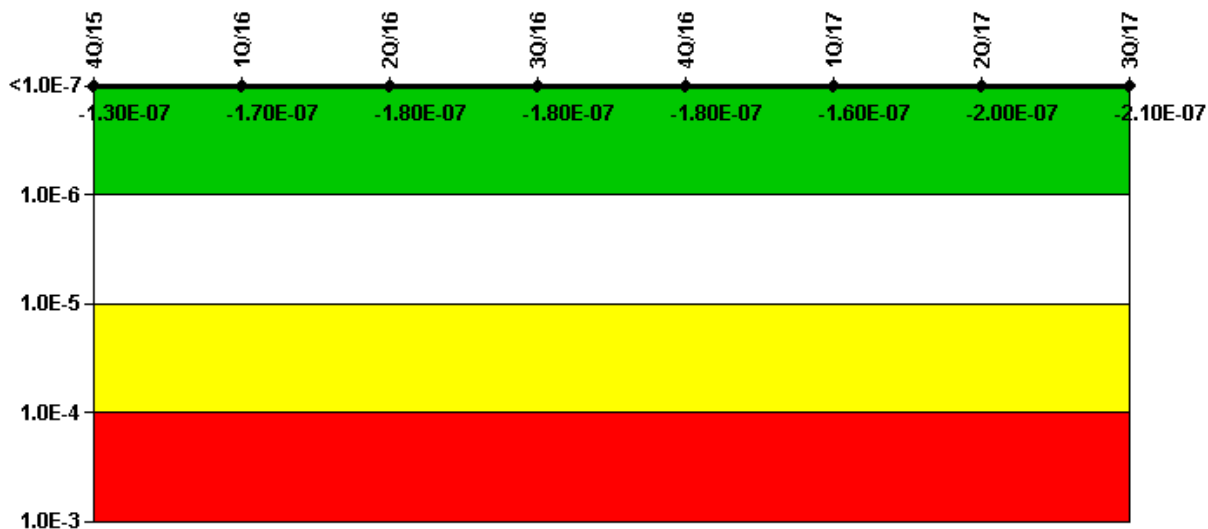
**Indicator value**    1   1   2   3   2   2   1   0

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#### Licensee Comments:

3Q/16: LER 2016-001-00, May 2016 AF Diesel Intake Design Deficiency Due to High Energy Line Break (HELB) Concerns. LER 2016-002-00 was issued 7/21/16, for Inadequate protection from Tornado Missiles Due to Non-conforming Design Conditions. 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.  
 2Q/16: LER 2015-006-00 was issued on 11/30/15 for Mode 3 entered with Turbine Trip safety Function disabled due to Safety Related Relay Leads lifted. May 2016 - LER 2016-001-00 IR2636112 ICES#322087  
 1Q/16: LER 2015-006-00 was issued on 11/30/15 for Mode 3 entered with Turbine Trip safety Function disabled due to Safety Related Relay Leads lifted.  
 4Q/15: LER 2015-006-00 was issued on 11/30/15 for Mode 3 entered with Turbine Trip safety Function disabled due to Safety Related Relay Leads lifted.

### Mitigating Systems Performance Index, Emergency AC Power System



Thresholds: White > 1.00E-6 Yellow > 1.00E-5 Red > 1.00E-4

#### Notes

#### Mitigating Systems Performance Index, Emergency AC Power System

	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
UAI ( $\Delta$ CDF)	5.03E-08	1.15E-08	8.38E-09	7.31E-09	6.00E-10	2.38E-08	5.72E-08	5.01E-08
URI ( $\Delta$ CDF)	-1.84E-07	-1.84E-07	-1.84E-07	-1.84E-07	-1.84E-07	-1.82E-07	-2.56E-07	-2.56E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-1.30E-07	-1.70E-07	-1.80E-07	-1.80E-07	-1.80E-07	-1.60E-07	-2.00E-07	-2.10E-07

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#### Licensee Comments:

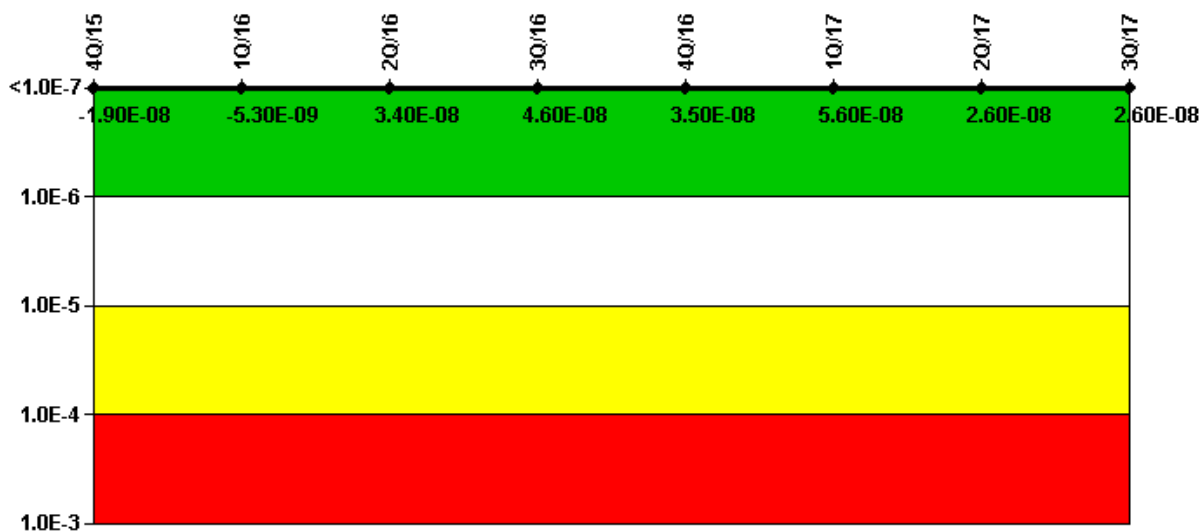
2Q/17: Changed PRA Parameter(s). Changed PRA Parameter(s).

3Q/16: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: Changed PRA Parameter(s).

### Mitigating Systems Performance Index, High Pressure Injection System



Thresholds: White > 1.00E-6 Yellow > 1.00E-5 Red > 1.00E-4

**Notes**

**Mitigating Systems Performance Index, High Pressure Injection System**

	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
UAI (ΔCDF)	-1.25E-08	1.10E-09	4.03E-08	5.24E-08	4.18E-08	6.19E-08	3.29E-08	3.29E-08
URI (ΔCDF)	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.49E-09	-6.49E-09
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-1.90E-08</b>	<b>-5.30E-09</b>	<b>3.40E-08</b>	<b>4.60E-08</b>	<b>3.50E-08</b>	<b>5.60E-08</b>	<b>2.60E-08</b>	<b>2.60E-08</b>

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Licensee Comments:

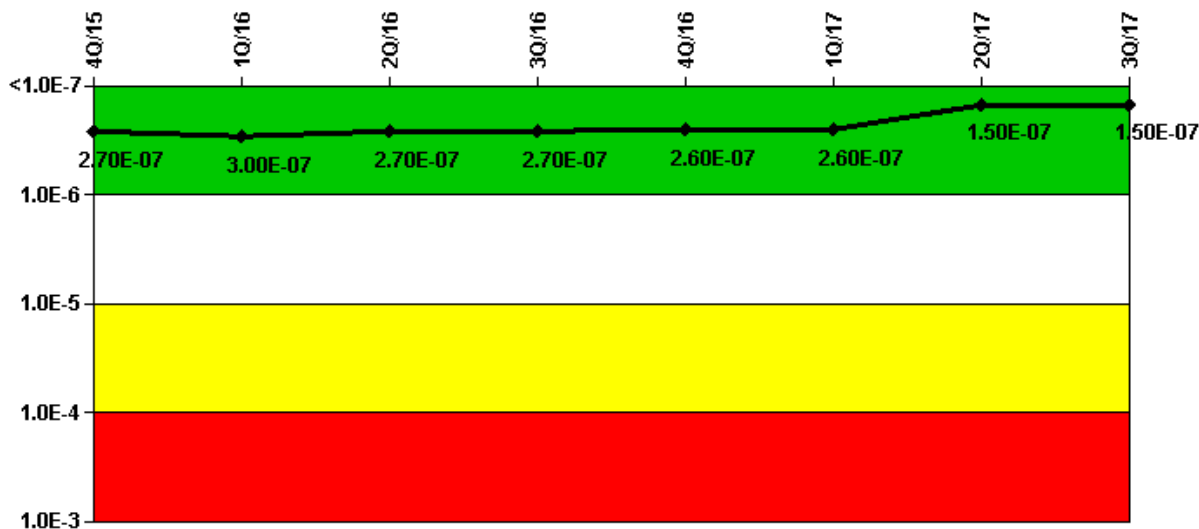
2Q/17: Changed PRA Parameter(s). Changed PRA Parameter(s).

3Q/16: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: Changed PRA Parameter(s).

### Mitigating Systems Performance Index, Heat Removal System



Thresholds: White > 1.00E-6 Yellow > 1.00E-5 Red > 1.00E-4

**Notes**

**Mitigating Systems Performance Index, Heat Removal System**

	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
UAI (ΔCDF)	1.75E-07	2.18E-07	1.88E-07	1.85E-07	1.70E-07	1.72E-07	1.15E-07	1.07E-07
URI (ΔCDF)	9.22E-08	8.68E-08	8.69E-08	8.67E-08	8.84E-08	9.25E-08	3.96E-08	3.95E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>2.70E-07</b>	<b>3.00E-07</b>	<b>2.70E-07</b>	<b>2.70E-07</b>	<b>2.60E-07</b>	<b>2.60E-07</b>	<b>1.50E-07</b>	<b>1.50E-07</b>

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Licensee Comments:

2Q/17: Changed PRA Parameter(s). Changed PRA Parameter(s).

1Q/17: Risk Cap Invoked.

4Q/16: Risk Cap Invoked. 3Q16: U2 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MSPI-001 Rev 18 was approved in June 2016

3Q/16: Risk Cap Invoked. 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

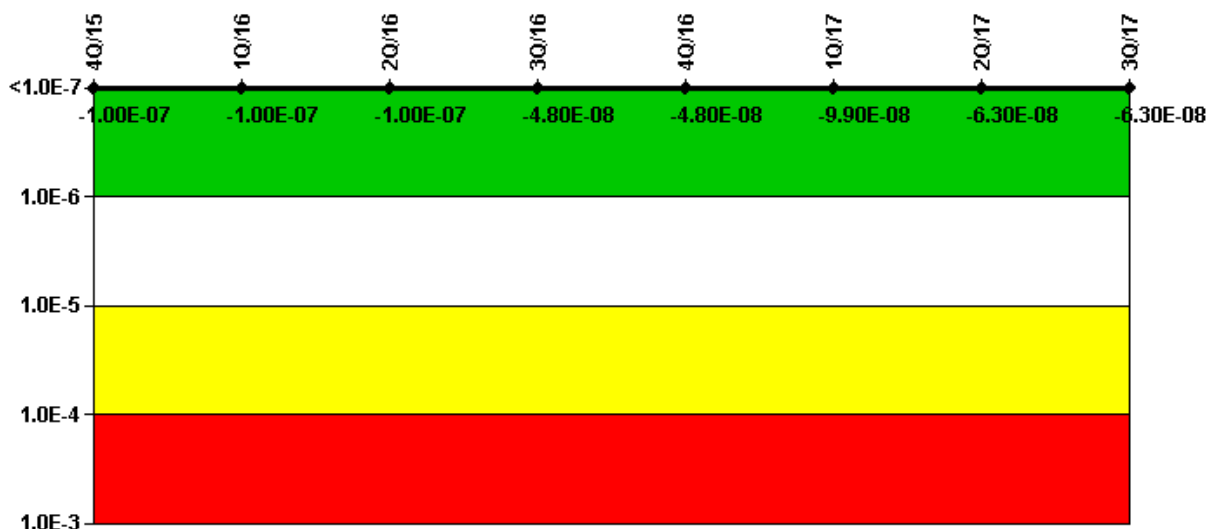
2Q/16: Risk Cap Invoked.

1Q/16: Risk Cap Invoked.

4Q/15: Risk Cap Invoked. 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: Risk Cap Invoked. Changed PRA Parameter(s).

### Mitigating Systems Performance Index, Residual Heat Removal System



Thresholds: White > 1.00E-6 Yellow > 1.00E-5 Red > 1.00E-4

**Notes**

**Mitigating Systems Performance Index, Residual Heat Removal System**

	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
UAI (ΔCDF)	-2.39E-08	-2.39E-08	-2.39E-08	2.87E-08	2.87E-08	-2.30E-08	-1.42E-08	-1.42E-08
URI (ΔCDF)	-7.64E-08	-7.64E-08	-7.64E-08	-7.64E-08	-7.64E-08	-7.64E-08	-4.91E-08	-4.91E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-1.00E-07</b>	<b>-1.00E-07</b>	<b>-1.00E-07</b>	<b>-4.80E-08</b>	<b>-4.80E-08</b>	<b>-9.90E-08</b>	<b>-6.30E-08</b>	<b>-6.30E-08</b>

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Licensee Comments:

2Q/17: Changed PRA Parameter(s). Changed PRA Parameter(s).

4Q/16: U1-U2 Train A crosstie considered unavailable starting 10/28/11 when standing order 11-057 and 1/2BFRH.1 procedure revisions were issued to remove procedural guidance on use of crosstie modification pending NRC approval. Reference IR 1257908

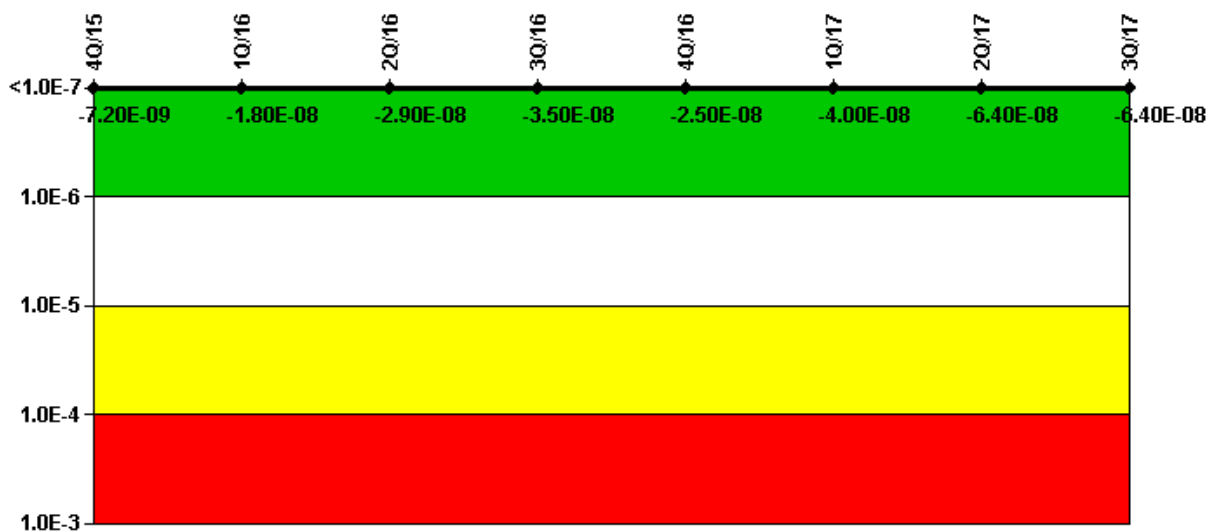
3Q/16: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: Changed PRA Parameter(s).



### Mitigating Systems Performance Index, Cooling Water Systems



Thresholds: White > 1.00E-6 Yellow > 1.00E-5 Red > 1.00E-4

**Notes**

**Mitigating Systems Performance Index, Cooling Water Systems**

	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
UAI (ΔCDF)	4.78E-08	3.74E-08	2.63E-08	1.99E-08	3.02E-08	1.49E-08	2.99E-08	3.00E-08
URI (ΔCDF)	-5.50E-08	-5.50E-08	-5.50E-08	-5.50E-08	-5.50E-08	-5.50E-08	-9.36E-08	-9.36E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-7.20E-09</b>	<b>-1.80E-08</b>	<b>-2.90E-08</b>	<b>-3.50E-08</b>	<b>-2.50E-08</b>	<b>-4.00E-08</b>	<b>-6.40E-08</b>	<b>-6.40E-08</b>

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Licensee Comments:

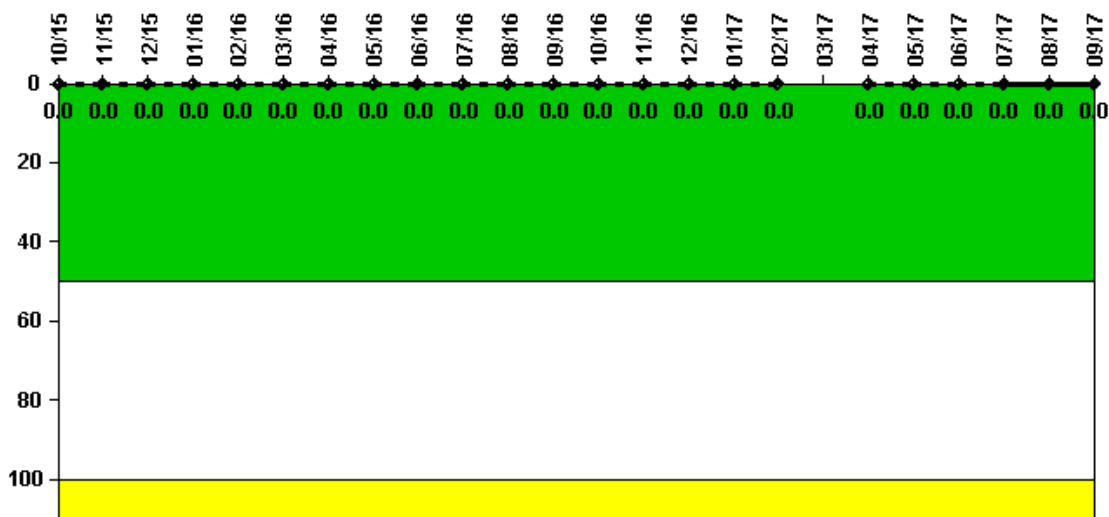
2Q/17: Changed PRA Parameter(s). Changed PRA Parameter(s).

3Q/16: Changed PRA Parameter(s). 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016.

4Q/15: Changed PRA Parameter(s).

### Reactor Coolant System Activity



Thresholds: White > 50.0 Yellow > 100.0

**Notes**

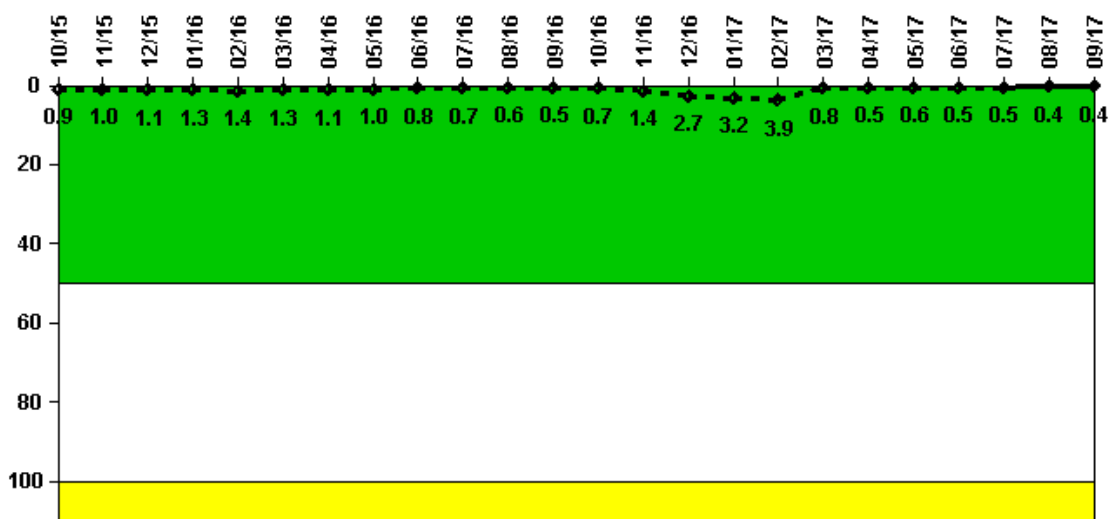
Reactor Coolant System Activity	10/15	11/15	12/15	1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16
Maximum activity	0.000154	0.000156	0.000168	0.000173	0.000267	0.000191	0.000204	0.000214	0.000220	0.000234	0.000250	0.000249
Technical specification limit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Indicator value	0	0	0	0	0	0	0	0	0	0	0	0
Reactor Coolant System Activity	10/16	11/16	12/16	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17
Maximum activity	0.000256	0.000280	0.000294	0.000294	0.000315	N/A	0.000117	0.000118	0.000130	0.000136	0.000138	0.000145
Technical specification limit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Indicator value	0	0	0	0	0	N/A	0	0	0	0	0	0

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Licensee Comments:

3/17: No steady state data was measured this period due to refueling outage B1R21  
 9/16: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016. PI

### Reactor Coolant System Leakage



Thresholds: White > 50.0 Yellow > 100.0

**Notes**

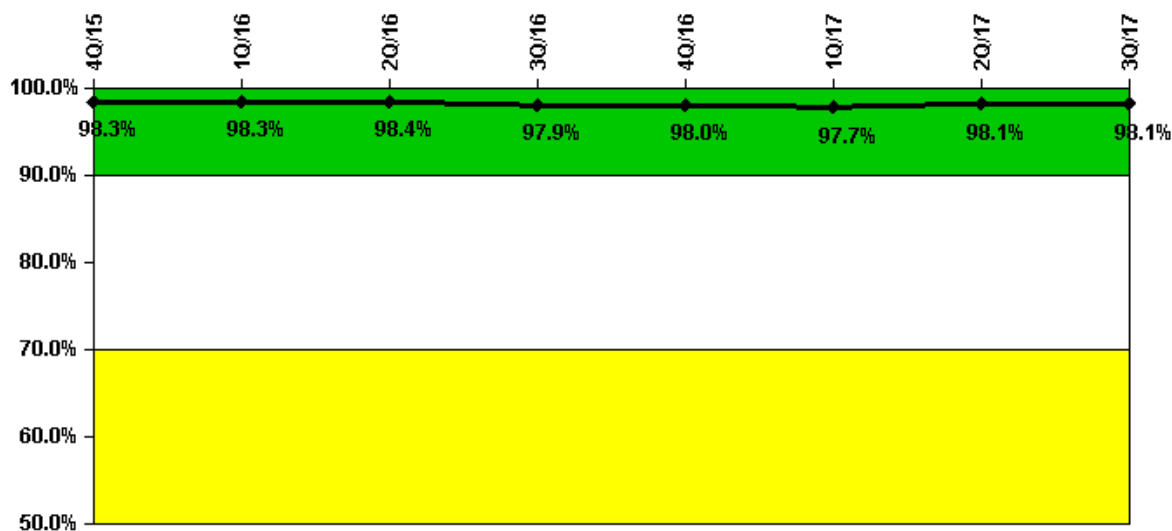
Reactor Coolant System Leakage	10/15	11/15	12/15	1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16
Maximum leakage	0.090	0.100	0.110	0.130	0.140	0.130	0.110	0.100	0.080	0.070	0.060	0.050
Technical specification limit	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
<b>Indicator value</b>	<b>0.9</b>	<b>1.0</b>	<b>1.1</b>	<b>1.3</b>	<b>1.4</b>	<b>1.3</b>	<b>1.1</b>	<b>1.0</b>	<b>0.8</b>	<b>0.7</b>	<b>0.6</b>	<b>0.5</b>
Reactor Coolant System Leakage	10/16	11/16	12/16	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17
Maximum leakage	0.070	0.140	0.270	0.320	0.390	0.080	0.050	0.060	0.050	0.050	0.040	0.040
Technical specification limit	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0
<b>Indicator value</b>	<b>0.7</b>	<b>1.4</b>	<b>2.7</b>	<b>3.2</b>	<b>3.9</b>	<b>0.8</b>	<b>0.5</b>	<b>0.6</b>	<b>0.5</b>	<b>0.5</b>	<b>0.4</b>	<b>0.4</b>

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Licensee Comments:

9/16: 4Q15: Unit 1 CDF and MSPI result were updated using the application specific model BB011b4, which takes credit for the Generation III Westinghouse RCP Shutdown Seals. The corresponding BY-MPSI-001 Rev 17 was approved in January 2016. PI

### Drill/Exercise Performance



Thresholds: White < 90.0% Yellow < 70.0%

#### Notes

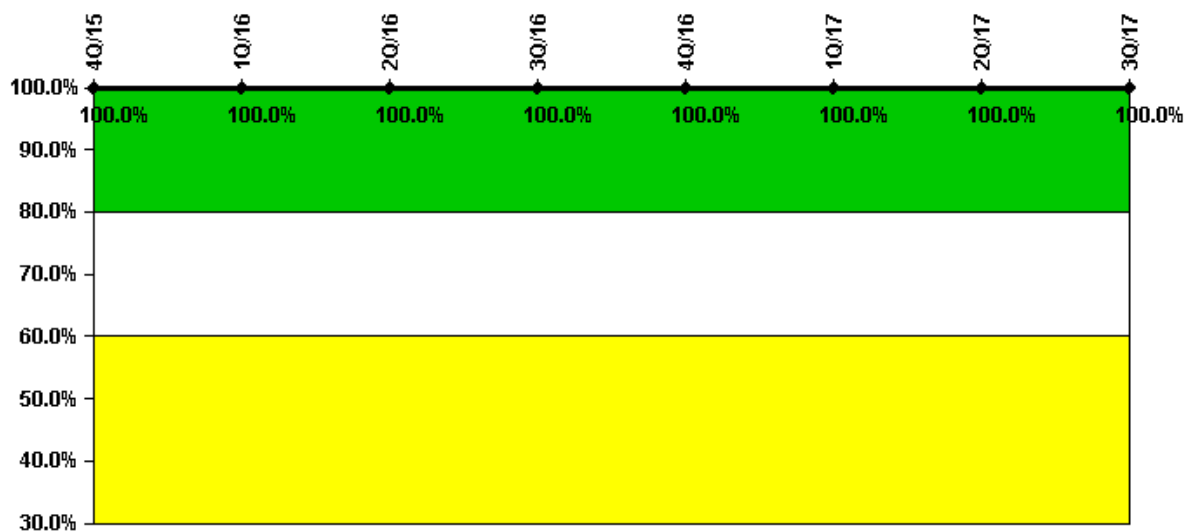
Drill/Exercise Performance	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Successful opportunities	32.0	106.0	44.0	29.0	34.0	28.0	55.0	40.0
Total opportunities	32.0	109.0	44.0	32.0	34.0	28.0	56.0	40.0

**Indicator value**                    **98.3% 98.3% 98.4% 97.9% 98.0% 97.7% 98.1% 98.1%**

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Licensee Comments: none

### ERO Drill Participation



Thresholds: White < 80.0% Yellow < 60.0%

**Notes**

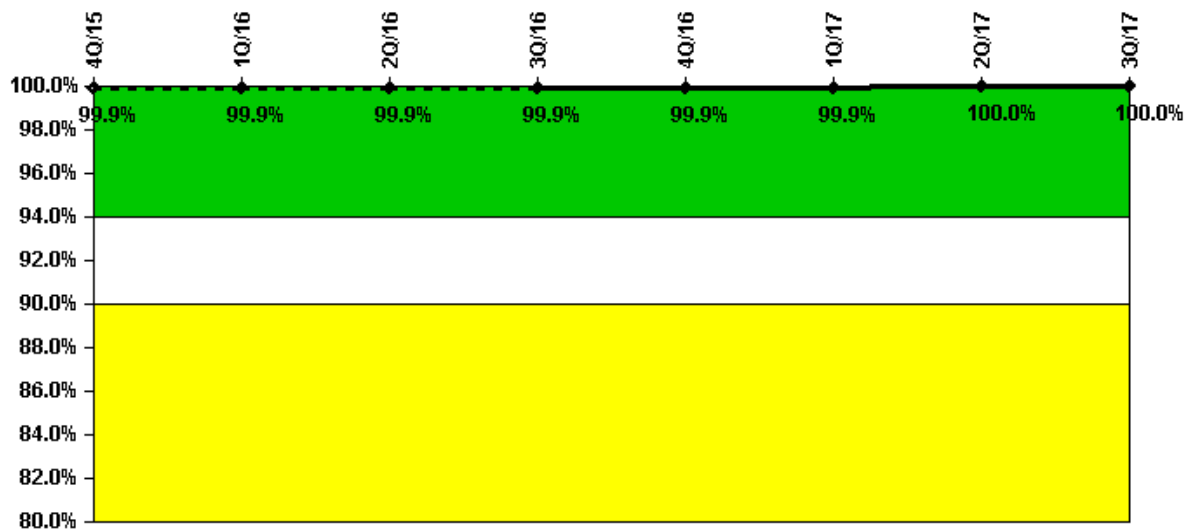
ERO Drill Participation	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Participating Key personnel	75.0	76.0	78.0	77.0	77.0	78.0	66.0	70.0
Total Key personnel	75.0	76.0	78.0	77.0	77.0	78.0	66.0	70.0

**Indicator value**                **100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0%**

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Licensee Comments: none

### Alert & Notification System



Thresholds: White < 94.0% Yellow < 90.0%

**Notes**

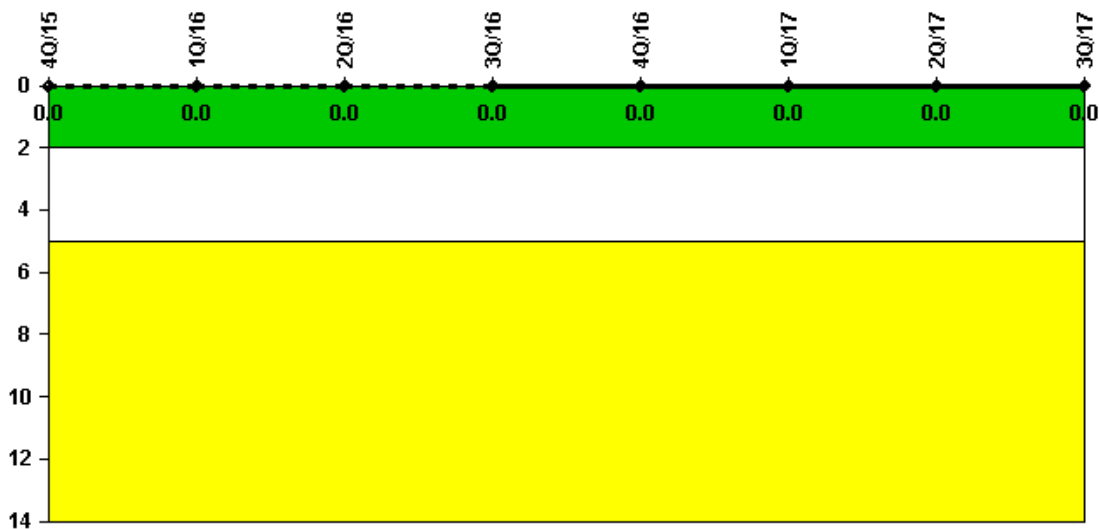
Alert & Notification System	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Successful siren-tests	3903	3897	3902	3900	3780	3964	3904	3842
Total sirens-tests	3904	3904	3904	3904	3782	3965	3904	3843

**Indicator value**                    **99.9%** **99.9%** **99.9%** **99.9%** **99.9%** **99.9%** **100.0%** **100.0%**

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Licensee Comments: none

### Occupational Exposure Control Effectiveness



Thresholds: White > 2.0 Yellow > 5.0

**Notes**

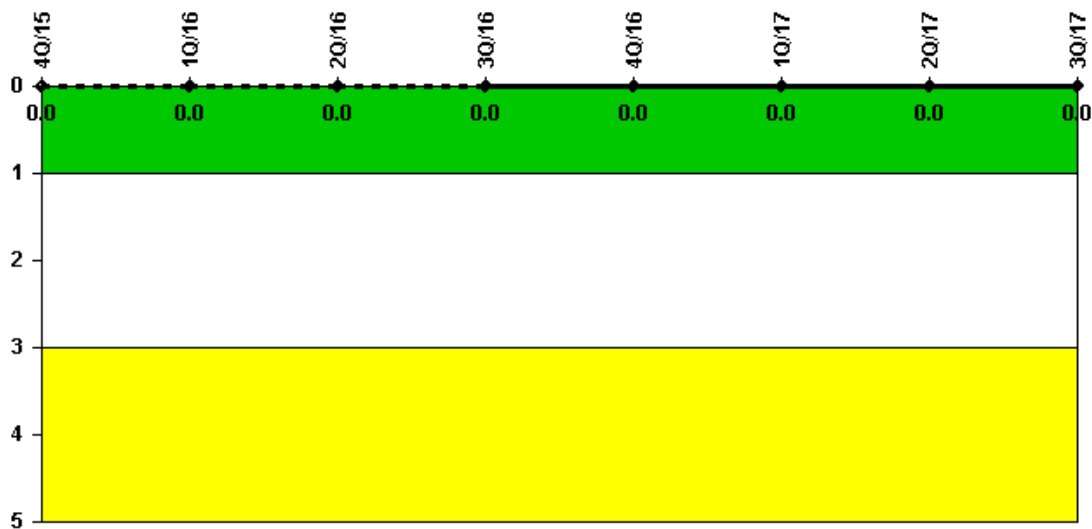
**Occupational Exposure Control Effectiveness** 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17

High radiation area occurrences	0	0	0	0	0	0	0	0
Very high radiation area occurrences	0	0	0	0	0	0	0	0
Unintended exposure occurrences	0	0	0	0	0	0	0	0
<b>Indicator value</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>

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Licensee Comments: none

### RETS/ODCM Radiological Effluent



Thresholds: White > 1.0 Yellow > 3.0

**Notes**

**RETS/ODCM Radiological Effluent** 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17

RETS/ODCM occurrences                    0    0    0    0    0    0    0    0

**Indicator value**                            0    0    0    0    0    0    0    0

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Licensee Comments: none

Although the Security Cornerstone is included in the Reactor Oversight Process assessment program, the Commission has decided that specific information related to findings and performance indicators pertaining to the Security Cornerstone will not be publicly available to ensure that security information is not provided to a possible adversary. Other than the fact that a finding or performance indicator is Green or Greater-Than-Green, security related information will not be displayed on the public web page.

*Current data as of: October 31, 2017*

*Page Last Reviewed/Updated Monday, November 06, 2017*