



Home > Nuclear Reactors > Operating Reactors > Reactor Oversight Process > Plant Summaries> Byron 1 > Quarterly Performance Indicators

Byron 1 – Quarterly Performance Indicators

4Q/2016 Performance Indicators

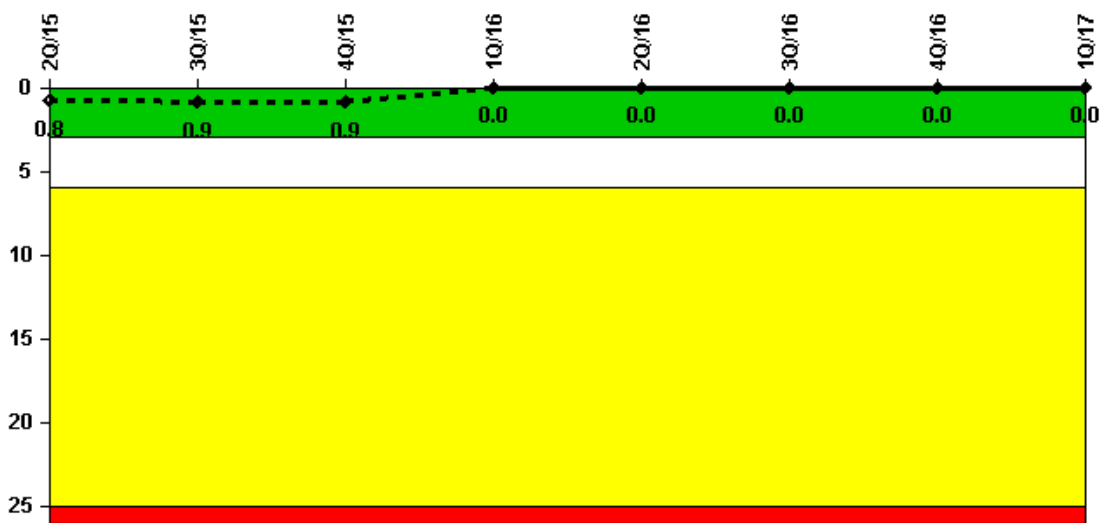
The solid trend line represents the current reporting period.

Licensee's General Comments: Byron Station 4Q2016 Data Unit 1

On this page:

- Unplanned Scrams (IE01)
- 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)
- Reactor Coolant System Activity (BI01)
- Reactor Coolant System Leakage (BI02)
- Drill/Exercise Performance (EP01)
- Emergency Response Organization Drill Participation (EP02)
- Alert and Notification System Reliability (EP03)
- Occupational Exposure Control Effectiveness (OR01)
- RETS/OCDM Radiological Effluent Occurrence (PR01)
- 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	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
Unplanned scrams	1.0	0	0	0	0	0	0	0
Critical hours	2026.0	2184.0	1800.0	2184.2	2183.0	2184.0	2208.0	2209.0

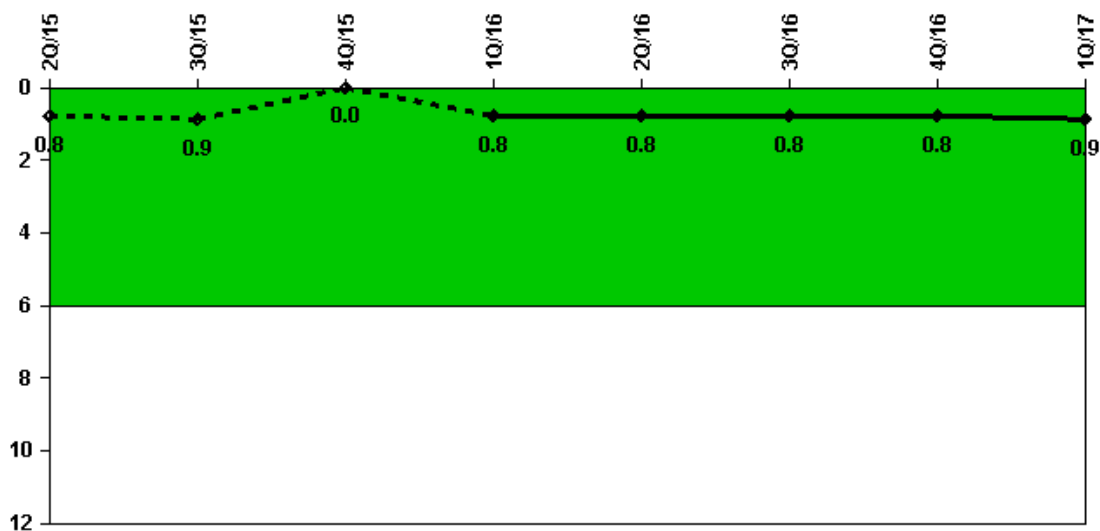
Indicator value	0.8	0.8	0.9	0.9	0	0	0	0
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Licensee Comments:

1Q/15: UNIT 1 AUTOMATICALLY TRIPPED AS A RESULT OF A WEATHER-RELATED EVENT THAT RESULTED IN A LOSS OF BUS 4. TRANSFORMERS AND BUSHINGS WERE INSPECTED AND REPAIRED.

Unplanned Power Changes per 7000 Critical Hrs



Thresholds: White > 6.0

Notes

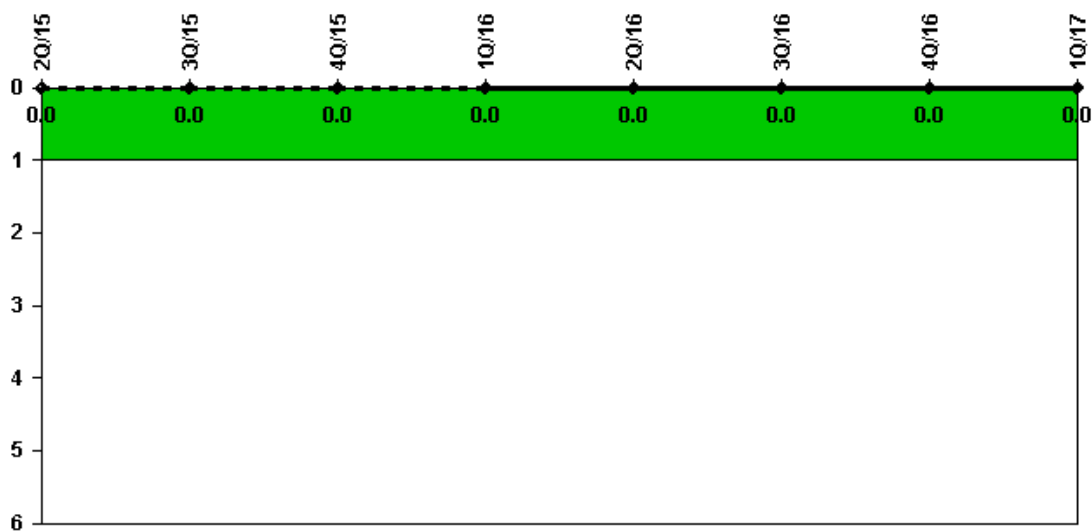
Unplanned Power Changes per 7000 Critical Hrs	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
Unplanned power changes	0	0	0	0	1.0	0	0	0
Critical hours	2026.0	2184.0	1800.0	2184.2	2183.0	2184.0	2208.0	2209.0

Indicator value	0.8	0.8	0.9	0	0.8	0.8	0.8	0.8
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Licensee Comments: none

Unplanned Scrams with Complications



Thresholds: White > 1.0

Notes

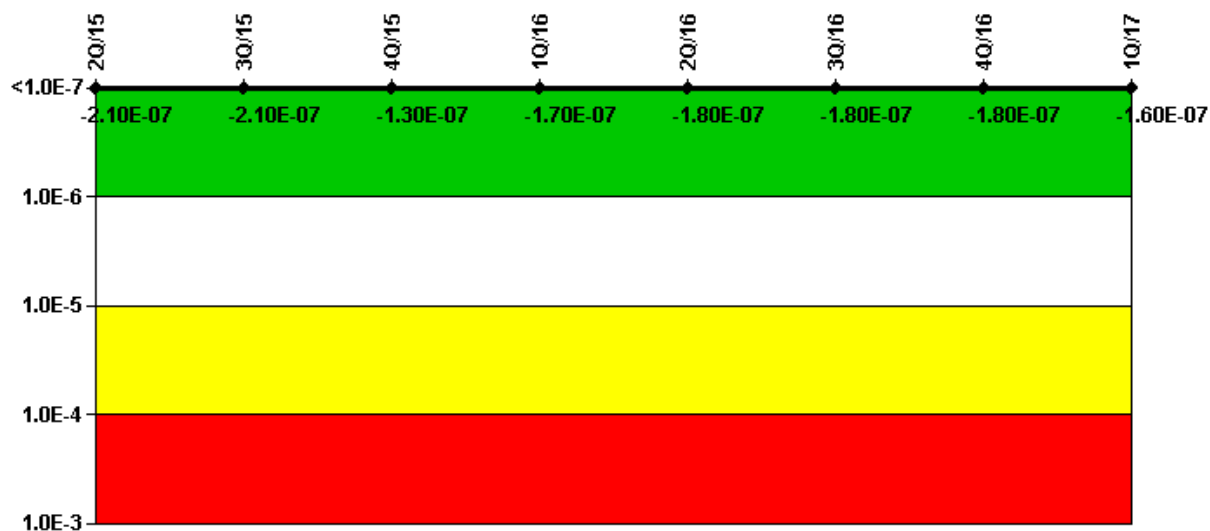
Unplanned Scrams with Complications 1Q/15 2Q/15 3Q/15 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17
 Scrams with complications 0 0 0 0 0 0 0 0 0

Indicator value 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0 0.0

TOP

Licensee Comments: none

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

	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
UAI (ΔCDF)	6.26E-08	6.26E-08	6.20E-08	5.03E-08	1.15E-08	8.38E-09	7.31E-09	6.00E-10
URI (ΔCDF)	-2.71E-07	-2.71E-07	-2.71E-07	-1.84E-07	-1.84E-07	-1.84E-07	-1.84E-07	-1.84E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-2.10E-07	-2.10E-07	-2.10E-07	-1.30E-07	-1.70E-07	-1.80E-07	-1.80E-07	-1.80E-07

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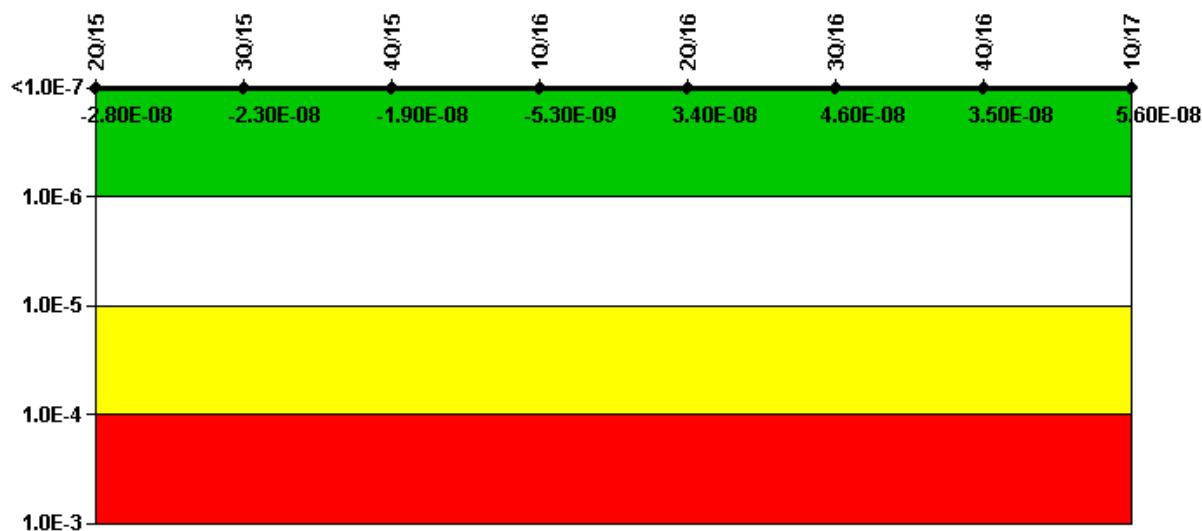
Licensee Comments:

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

	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
UAI (ΔCDF)	-1.89E-08	-1.89E-08	-1.41E-08	-1.25E-08	1.10E-09	4.03E-08	5.24E-08	4.18E-08
URI (ΔCDF)	-9.21E-09	-9.21E-09	-9.21E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-2.80E-08	-2.80E-08	-2.30E-08	-1.90E-08	-5.30E-09	3.40E-08	4.60E-08	3.50E-08

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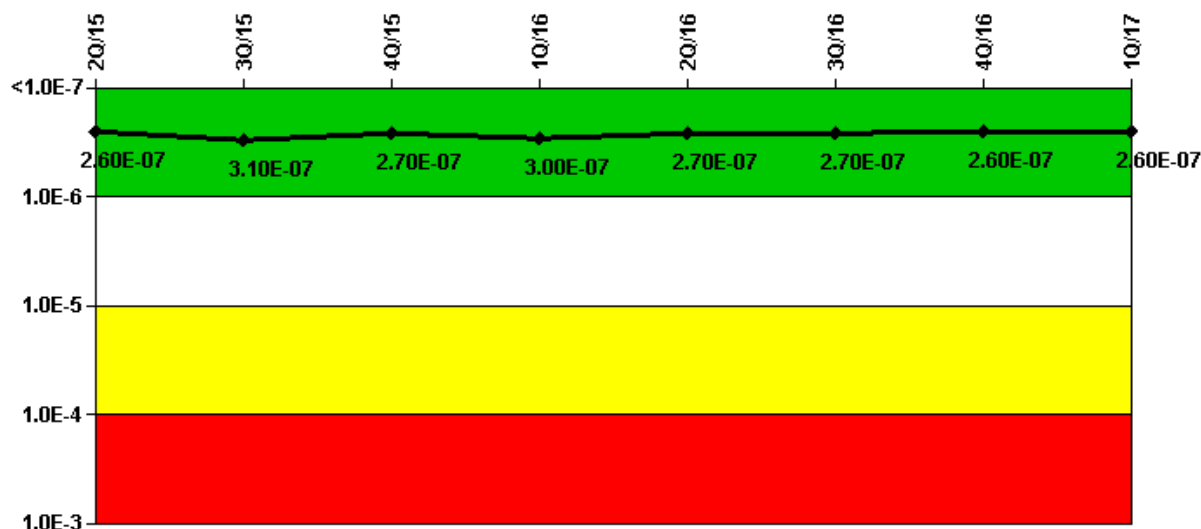
Licensee Comments:

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

	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
UAI (ΔCDF)	3.66E-08	1.49E-07	2.24E-07	1.75E-07	2.18E-07	1.88E-07	1.85E-07	1.70E-07
URI (ΔCDF)	-3.74E-07	1.07E-07	8.13E-08	9.22E-08	8.68E-08	8.69E-08	8.67E-08	8.84E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-3.40E-07	2.60E-07	3.10E-07	2.70E-07	3.00E-07	2.70E-07	2.70E-07	2.60E-07

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Licensee Comments:

4Q/16: Risk Cap Invoked. 3Q/16: 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. 4Q/15: 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.

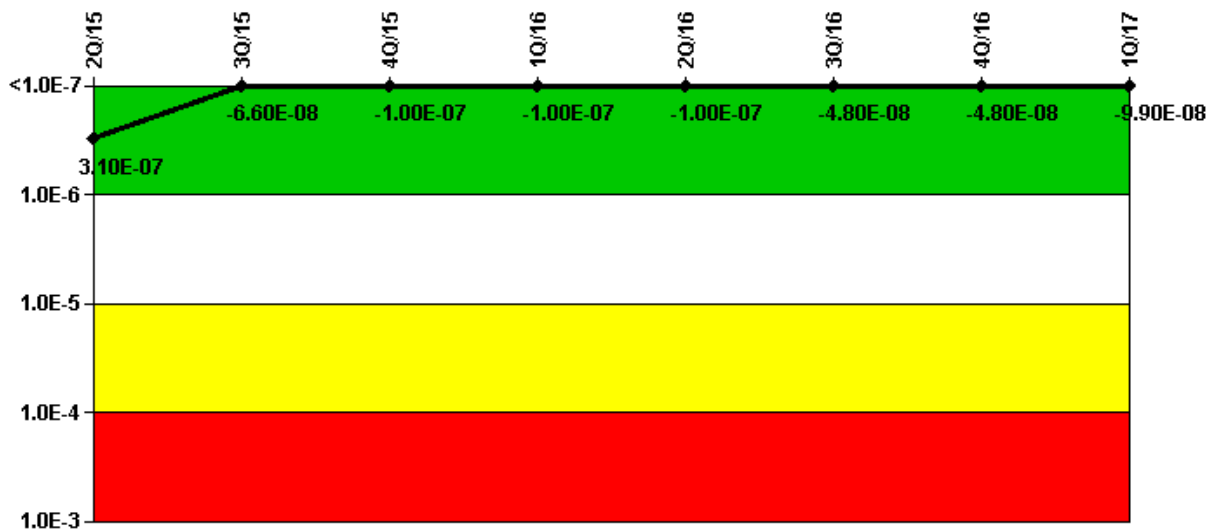
2Q/16: Risk Cap Invoked.

1Q/16: Risk Cap Invoked.

4Q/15: Risk Cap Invoked. 4Q/15: 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

	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
UAI (ΔCDF)	-1.11E-08	4.34E-08	4.18E-08	-2.39E-08	-2.39E-08	-2.39E-08	2.87E-08	2.87E-08
URI (ΔCDF)	2.69E-07	2.69E-07	-1.08E-07	-7.64E-08	-7.64E-08	-7.64E-08	-7.64E-08	-7.64E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	2.60E-07	3.10E-07	-6.60E-08	-1.00E-07	-1.00E-07	-1.00E-07	-4.80E-08	-4.80E-08

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Licensee Comments:

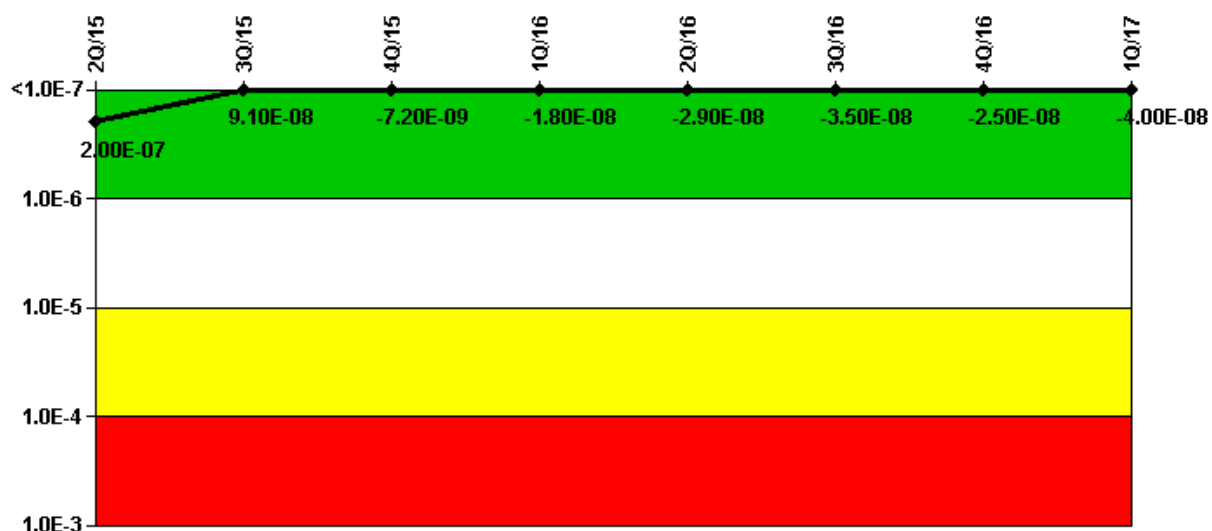
4Q/16: U1-U2 Train A crosstie considered unavailable starting 10/28/11 when standing order 11-057 and 1/2BFRH.1 procedure revisions were issued to remove procedural guidance on use of crosstie modification pending NRC approval. Reference IR 1257908

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

	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
UAI (ΔCDF)	2.27E-07	1.86E-07	1.85E-07	4.78E-08	3.74E-08	2.63E-08	1.99E-08	3.02E-08
URI (ΔCDF)	1.69E-08	1.69E-08	-9.41E-08	-5.50E-08	-5.50E-08	-5.50E-08	-5.50E-08	-5.50E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	2.40E-07	2.00E-07	9.10E-08	-7.20E-09	-1.80E-08	-2.90E-08	-3.50E-08	-2.50E-08

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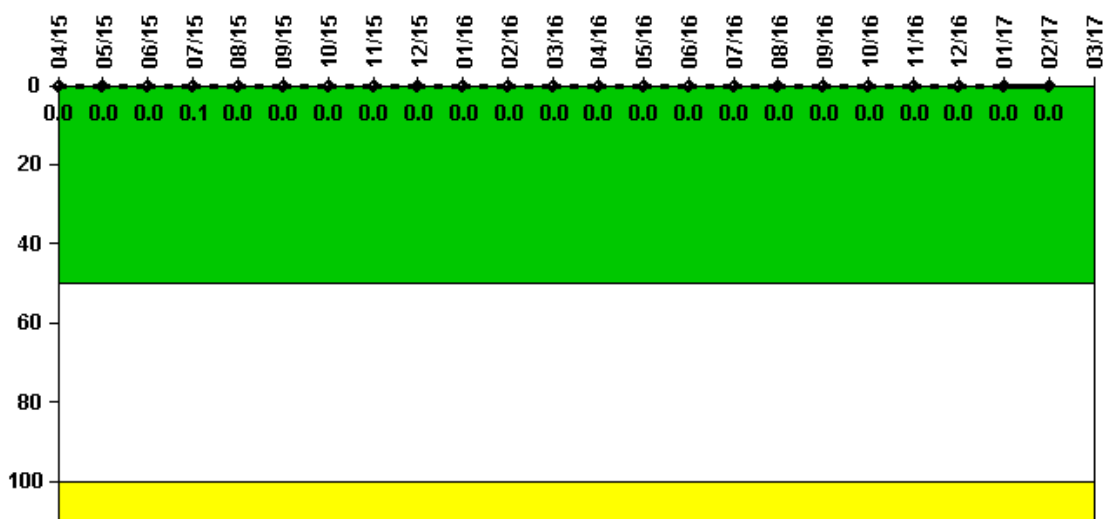
Licensee Comments:

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

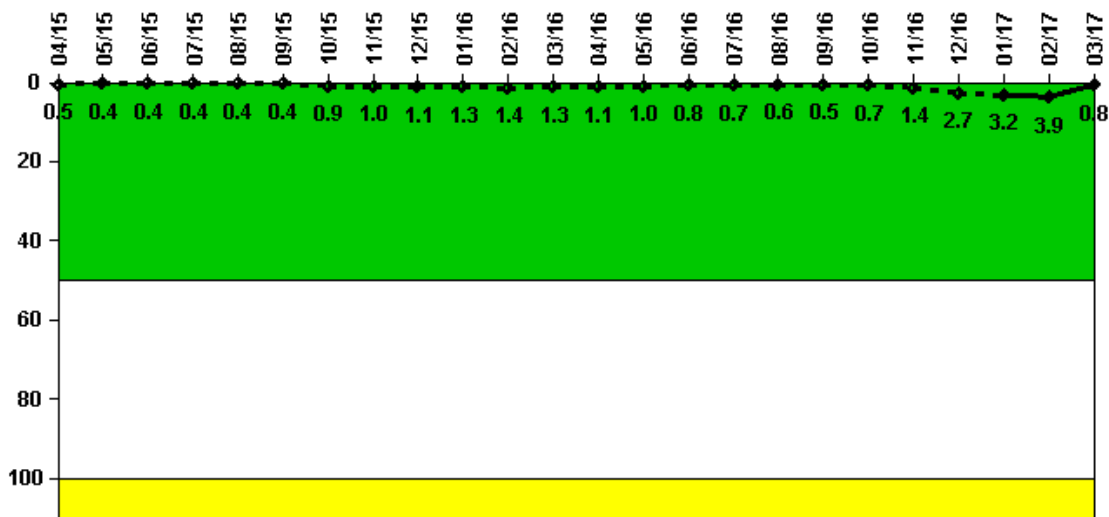
Reactor Coolant System Activity	1/15	2/15	3/15	4/15	5/15	6/15	7/15	8/15	9/15	10/15	11/15	12/15
Maximum activity	0.000296	0.000305	0.000308	0.000333	0.000343	0.000369	0.000500	0.000389	0.000383	0.000154	0.000156	0.000168
Technical specification limit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
Indicator value	0	0	0	0	0	0	0.1	0	0	0	0	0
Reactor Coolant System Activity	1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16	10/16	11/16	12/16
Maximum activity	0.000173	0.000267	0.000191	0.000204	0.000214	0.000220	0.000234	0.000250	0.000249	0.000256	0.000280	0.000294
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

▲ TOP

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

Reactor Coolant System Leakage



Thresholds: White > 50.0 Yellow > 100.0

Notes

Reactor Coolant System Leakage	1/15	2/15	3/15	4/15	5/15	6/15	7/15	8/15	9/15	10/15	11/15	12/15
Maximum leakage	0.040	0.040	0.050	0.047	0.040	0.040	0.040	0.040	0.040	0.090	0.100	0.110
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

Indicator value	0.4	0.4	0.5	0.5	0.4	0.4	0.4	0.4	0.4	0.9	1.0	1.1
Reactor Coolant System Leakage	1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16	10/16	11/16	12/16
Maximum leakage	0.130	0.140	0.130	0.110	0.100	0.080	0.070	0.060	0.050	0.070	0.140	0.270
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

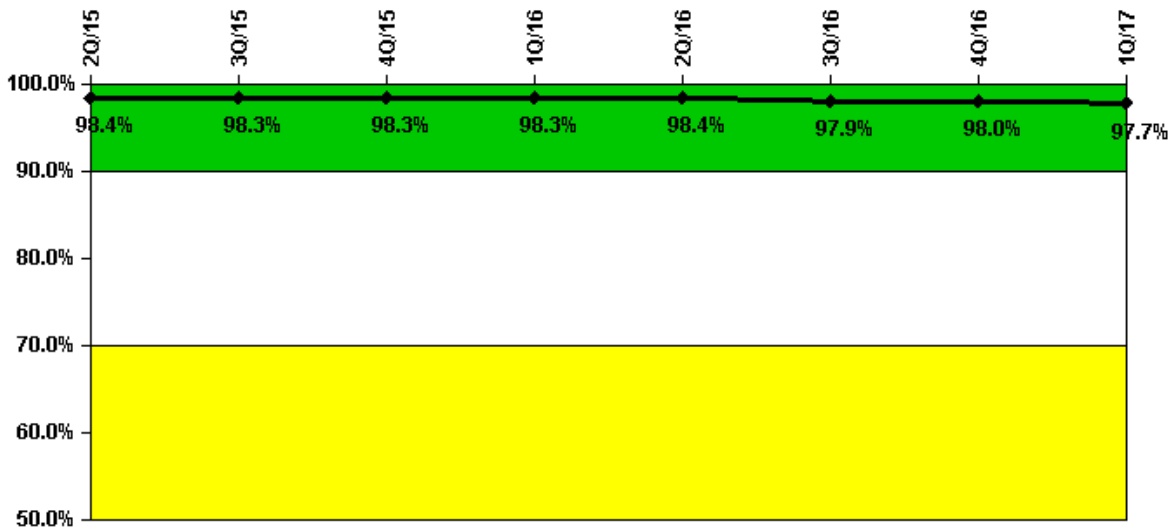
Indicator value	1.3	1.4	1.3	1.1	1.0	0.8	0.7	0.6	0.5	0.7	1.4	2.7
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Licensee Comments:

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

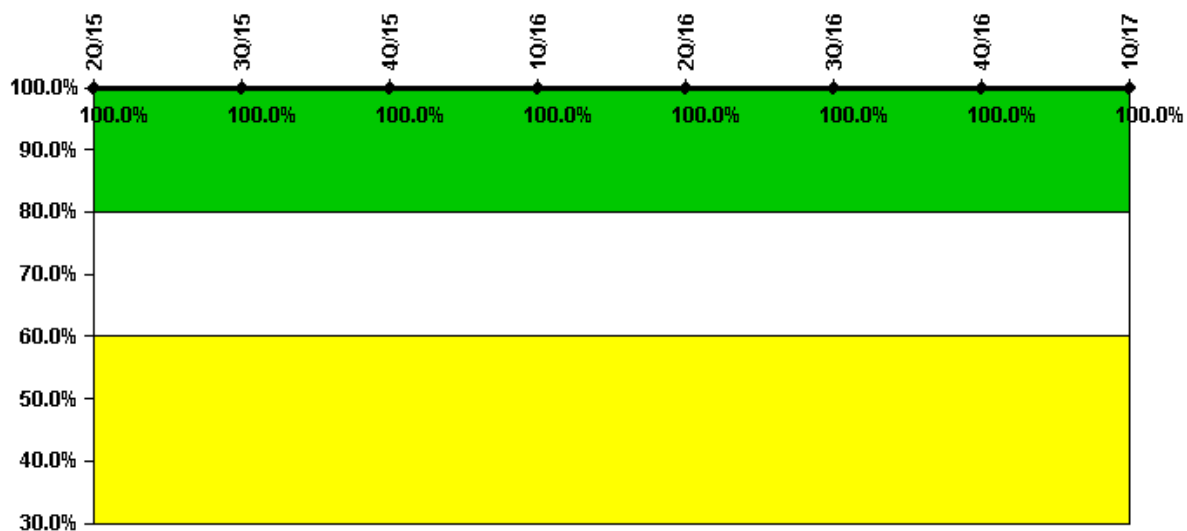
Drill/Exercise Performance	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
Successful opportunities	74.0	41.0	27.0	32.0	106.0	44.0	29.0	34.0
Total opportunities	74.0	43.0	27.0	32.0	109.0	44.0	32.0	34.0

Indicator value 98.8% 98.4% 98.3% 98.3% 98.3% 98.4% 97.9% 98.0%

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Licensee Comments: none

ERO Drill Participation



Thresholds: White < 80.0% Yellow < 60.0%

Notes

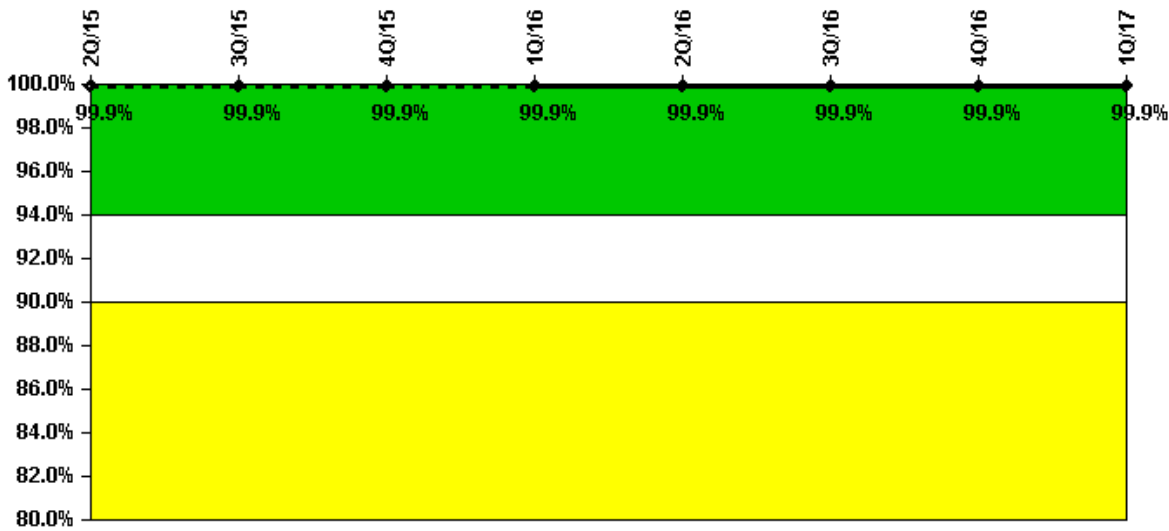
ERO Drill Participation	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
Participating Key personnel	74.0	74.0	72.0	75.0	76.0	78.0	77.0	77.0
Total Key personnel	74.0	74.0	72.0	75.0	76.0	78.0	77.0	77.0

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

▲ TOP

Licensee Comments: none

Alert & Notification System



Thresholds: White < 94.0% Yellow < 90.0%

Notes

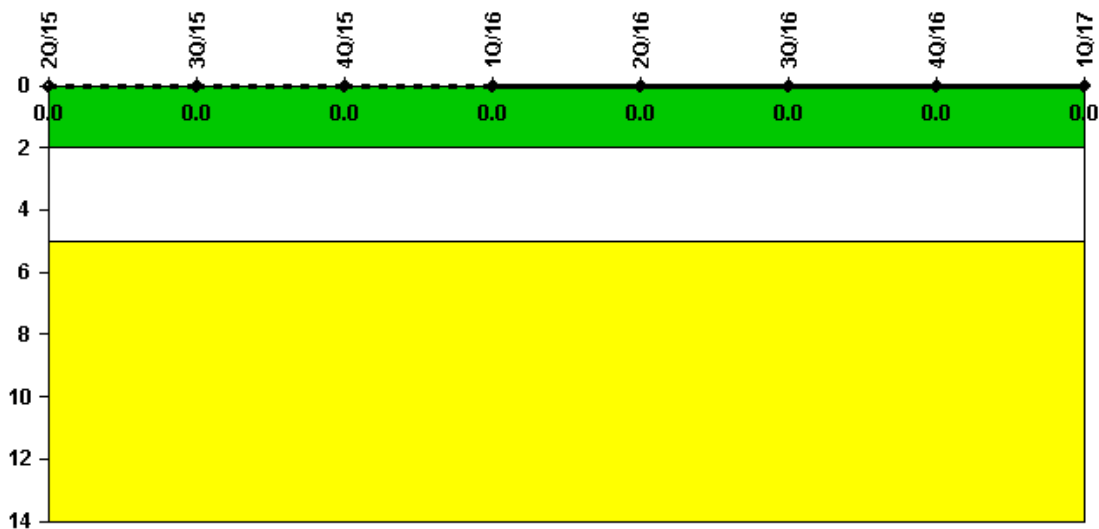
Alert & Notification System	1Q/15	2Q/15	3Q/15	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16
Successful siren-tests	3834	3902	3962	3903	3897	3902	3900	3780
Total sirens-tests	3840	3904	3965	3904	3904	3904	3904	3782

Indicator value 99.9% 99.9% 99.9% 99.9% 99.9% 99.9% 99.9% 99.9%

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Licensee Comments: none

Occupational Exposure Control Effectiveness



Thresholds: White > 2.0 Yellow > 5.0

Notes

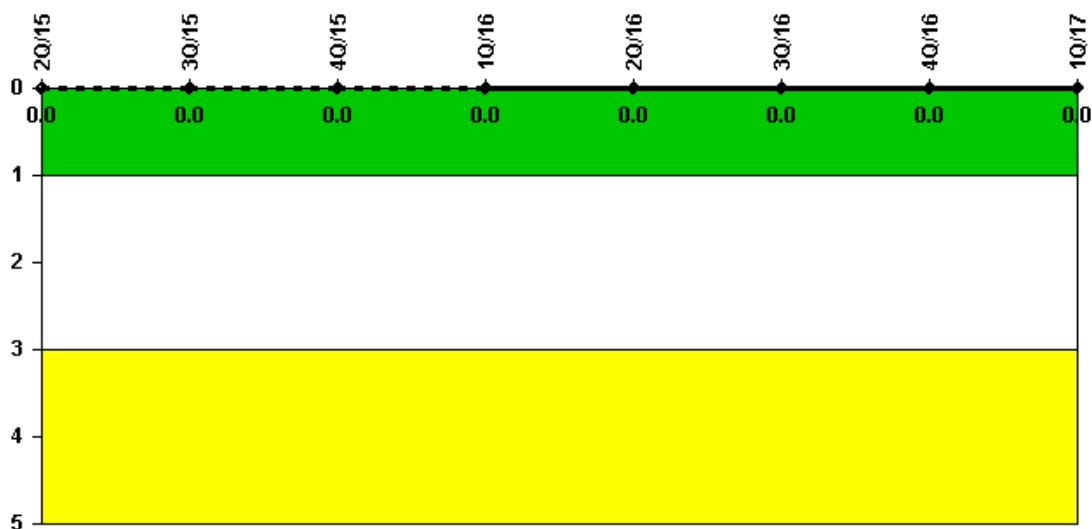
Occupational Exposure Control Effectiveness 1Q/15 2Q/15 3Q/15 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17

High radiation area occurrences	0	0	0	0	0	0	0	0	0
Very high radiation area occurrences	0	0	0	0	0	0	0	0	0
Unintended exposure occurrences	0	0	0	0	0	0	0	0	0
Indicator value	0	0	0	0	0	0	0	0	0

TOP

Licensee Comments: none

RETS/ODCM Radiological Effluent



Thresholds: White > 1.0 Yellow > 3.0

Notes

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

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

Indicator value 0 0 0 0 0 0 0 0 0

[TOP](#)

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: February 8, 2017

Page Last Reviewed/Updated Wednesday, June 07, 2017