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Watts Bar 1 – Quarterly Performance Indicators

4Q/2017 Performance Indicators

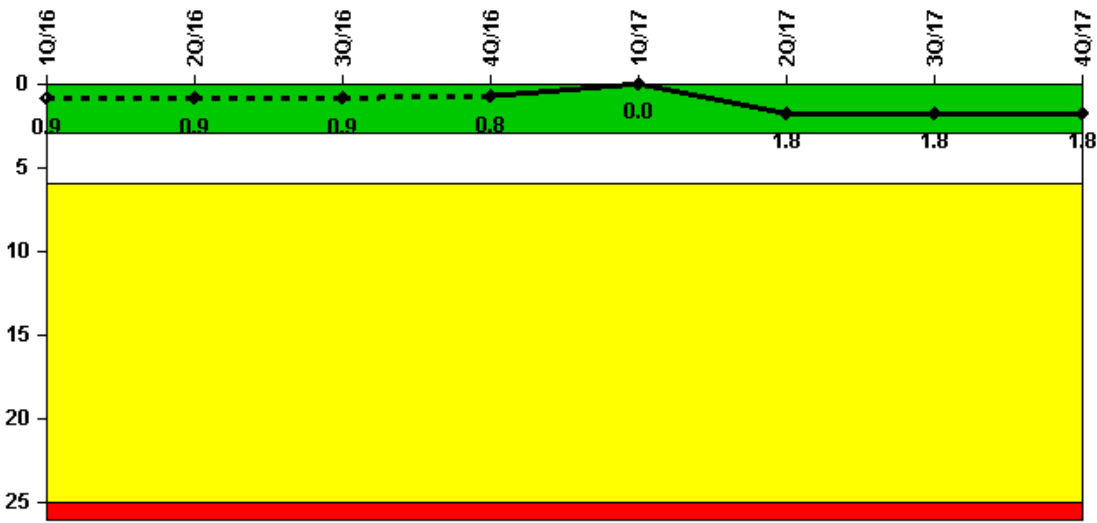
The solid trend line represents the current reporting period.

Licensee's General Comments: none

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

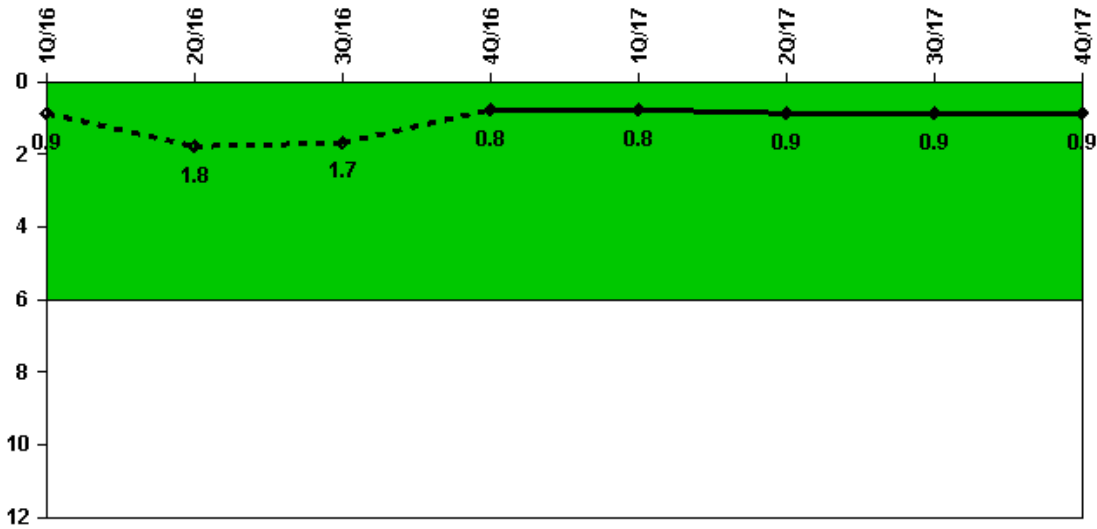
Unplanned Scrams per 7000 Critical Hrs	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Unplanned scrams	1.0	0	0	0	0	2.0	0	0
Critical hours	2109.4	2184.0	2208.0	2209.0	1833.1	1353.8	2208.0	2209.0

Indicator value	0.9	0.9	0.9	0.8	0	1.8	1.8	1.8
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Licensee Comments: none

Unplanned Power Changes per 7000 Critical Hrs



Thresholds: White > 6.0

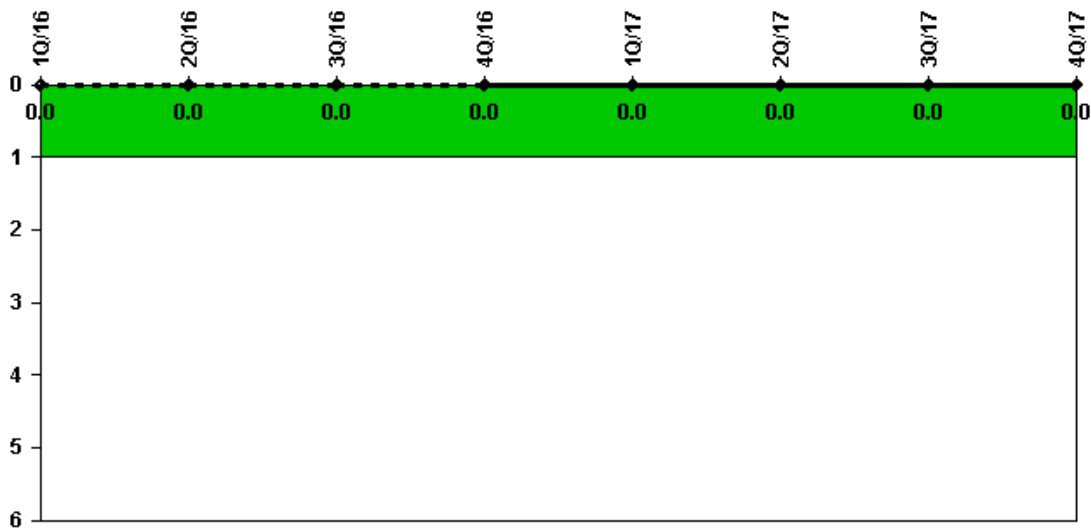
Notes

Unplanned Power Changes per 7000 Critical Hrs	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Unplanned power changes	0	1.0	0	0	0	1.0	0	0
Critical hours	2109.4	2184.0	2208.0	2209.0	1833.1	1353.8	2208.0	2209.0
Indicator value	0.9	1.8	1.7	0.8	0.8	0.9	0.9	0.9

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Licensee Comments: none

Unplanned Scrams with Complications



Thresholds: White > 1.0

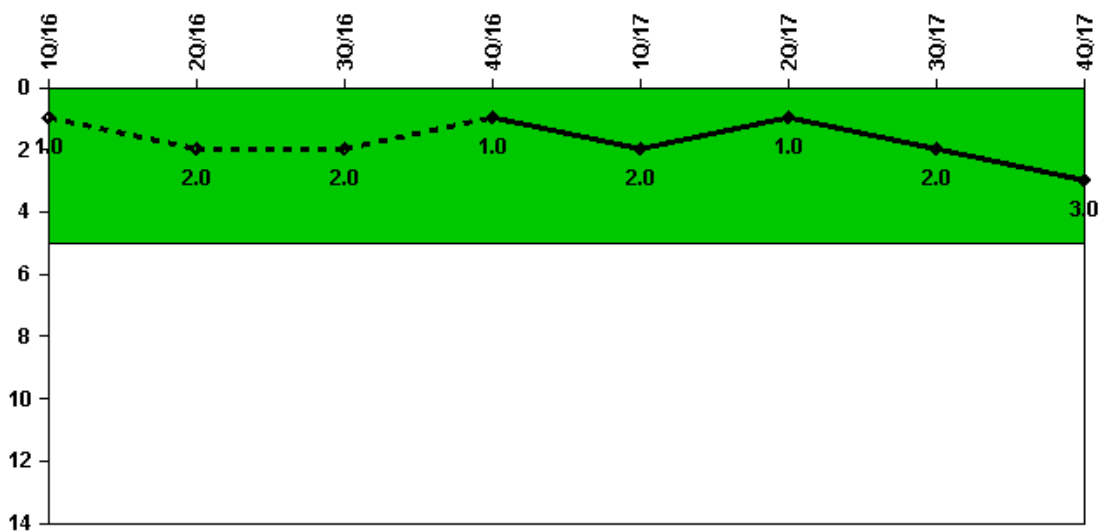
Notes

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

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Licensee Comments: none

Safety System Functional Failures (PWR)



Thresholds: White > 5.0

Notes

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

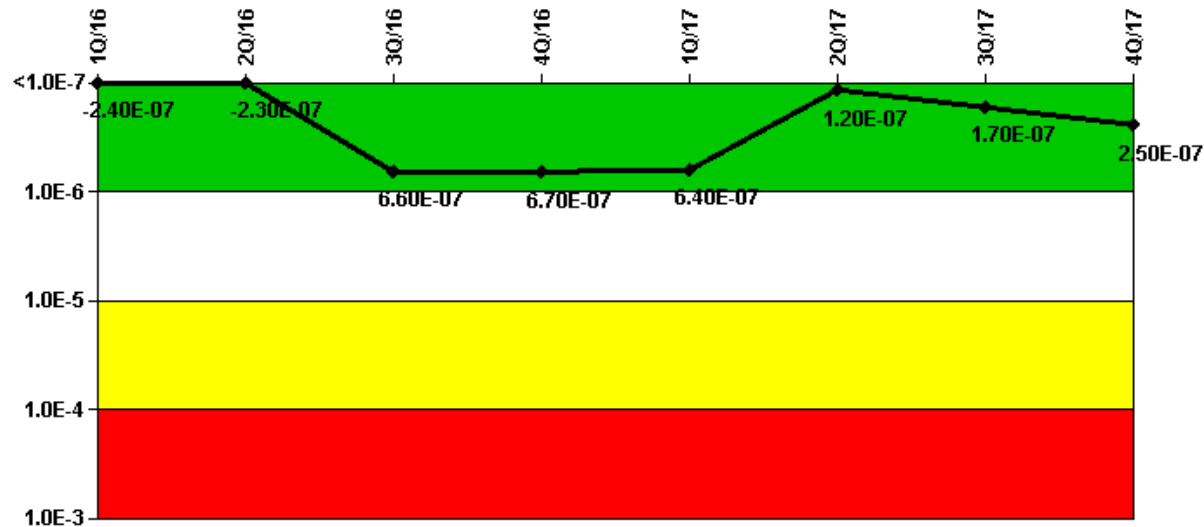
Safety System Functional Failures 0 1 0 0 1 0 1 1

Indicator value 1 2 2 1 2 1 2 3

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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/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (ΔCDF)	5.07E-07	5.20E-07	5.75E-07	1.49E-07	1.10E-07	2.61E-08	6.21E-08	7.19E-08
URI (ΔCDF)	-7.50E-07	-7.53E-07	8.98E-08	5.25E-07	5.25E-07	9.55E-08	1.09E-07	1.74E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-2.40E-07	-2.30E-07	6.60E-07	6.70E-07	6.40E-07	1.20E-07	1.70E-07	2.50E-07

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Licensee Comments:

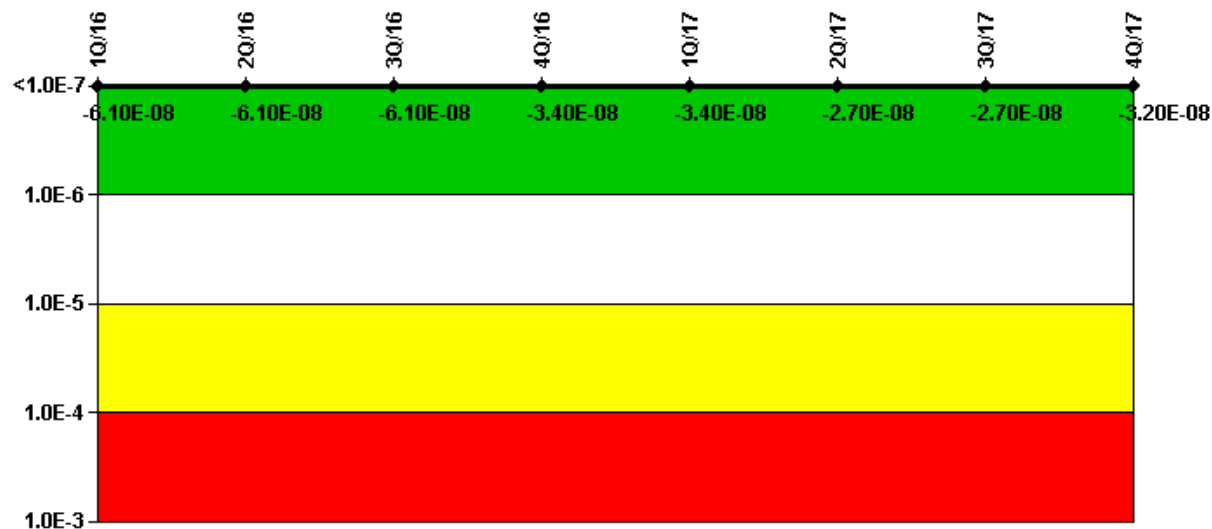
4Q/17: Changed PRA Parameter(s). PRA values were update due to basis document change due to scope change on Cooling Water ERCW headers being added.

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

1Q/17: Risk Cap Invoked.

4Q/16: Risk Cap Invoked. Changed PRA Parameter(s). PRA model update with MSPI basis document revision. Comment will be submitted with NRC submittal

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/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (ΔCDF)	-5.24E-08	-5.26E-08	-5.28E-08	-3.00E-08	-3.00E-08	-2.40E-08	-2.40E-08	-2.81E-08
URI (ΔCDF)	-8.35E-09	-8.35E-09	-8.35E-09	-4.44E-09	-4.44E-09	-3.39E-09	-3.39E-09	-3.74E-09

PLE	NO	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-6.10E-08	-6.10E-08	-6.10E-08	-3.40E-08	-3.40E-08	-2.70E-08	-2.70E-08	-3.20E-08	

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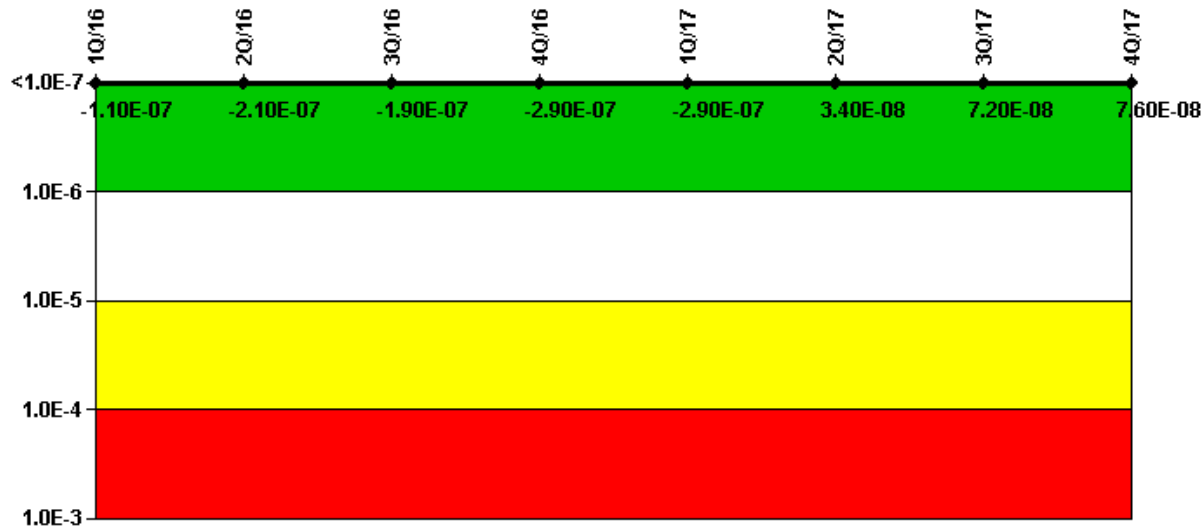
Licensee Comments:

4Q/17: Changed PRA Parameter(s). PRA values were update due to basis document change due to scope change on Cooling Water ERCW headers being added.

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

4Q/16: Changed PRA Parameter(s). PRA model update with MSPI basis document revision. Comment will be submitted with NRC submittal

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/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (ΔCDF)	1.19E-07	1.91E-08	3.97E-08	-2.96E-08	-2.98E-08	2.36E-10	3.25E-09	3.32E-09
URI (ΔCDF)	-2.30E-07	-2.28E-07	-2.28E-07	-2.60E-07	-2.60E-07	3.34E-08	6.86E-08	7.31E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-1.10E-07	-2.10E-07	-1.90E-07	-2.90E-07	-2.90E-07	3.40E-08	7.20E-08	7.60E-08

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Licensee Comments:

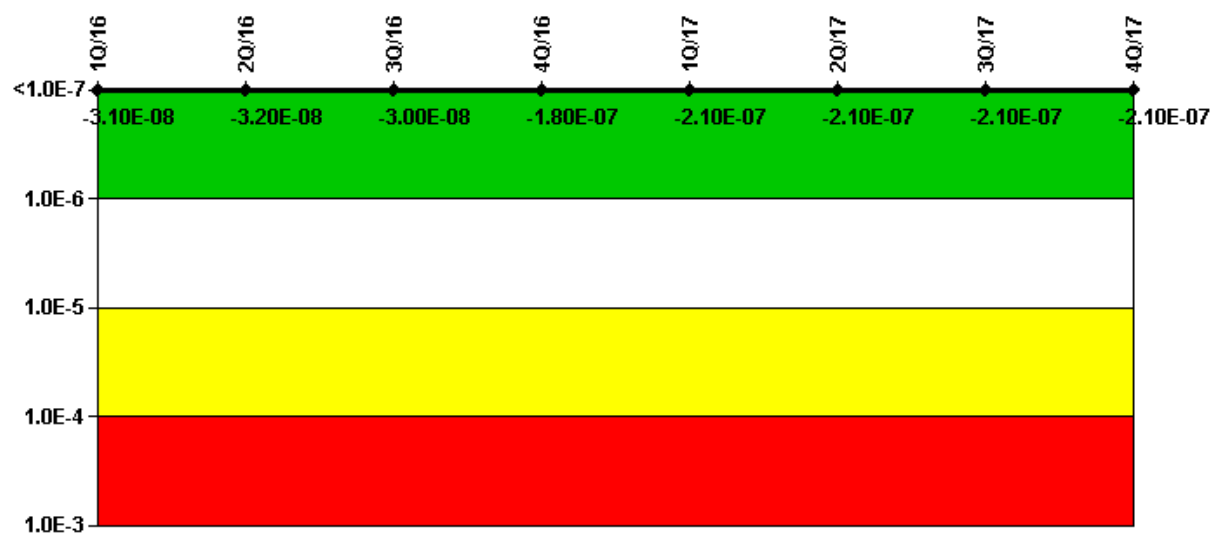
4Q/17: Changed PRA Parameter(s). PRA values were update due to basis document change due to scope change on Cooling Water ERCW headers being added.

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

4Q/16: The CAFTA PRA Model for Watts Bar Revision 2 was approved on 9/30/16 and corresponding MSPI Basis Document Revision 11 was approved on 01/18/17. The PRA model revision was a periodic update to incorporate system design changes. As a result of the PRA model change, the CDF, Fussel-Vesely and Basic Event Probabilities for all monitored trains and components were revised. The 1A and 1B D/G planned maintenance base line was changed based upon a preventative maintenance activity (7 day tank inspection) that is performed once every 10 years in the first quarter 2017. This activity is tracked and will be removed from the baseline in 12 quarters. MS08 change file is due to run hours were incorrectly entered in 1st Qty 2015 for the Terry Turbine Train. The run hours were supposed to be to the Motor Driven. The correct changes were made. No affect on Color for MS08. MS09 change file is due to small number of unavailability hours that was not entered in 1st Quarter 2015. No affect on Color for MS09.

4Q/16: Changed PRA Parameter(s). PRA model update with MSPI basis document revision. Comment will be submitted with NRC submittal

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/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (ΔCDF)	-4.47E-09	-4.47E-09	-2.26E-09	7.14E-09	-1.59E-08	-1.54E-08	-1.36E-08	-1.58E-08
URI (ΔCDF)	-2.68E-08	-2.73E-08	-2.78E-08	-1.90E-07	-1.93E-07	-1.97E-07	-1.97E-07	-1.99E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-3.10E-08	-3.20E-08	-3.00E-08	-1.80E-07	-2.10E-07	-2.10E-07	-2.10E-07	-2.10E-07

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Licensee Comments:

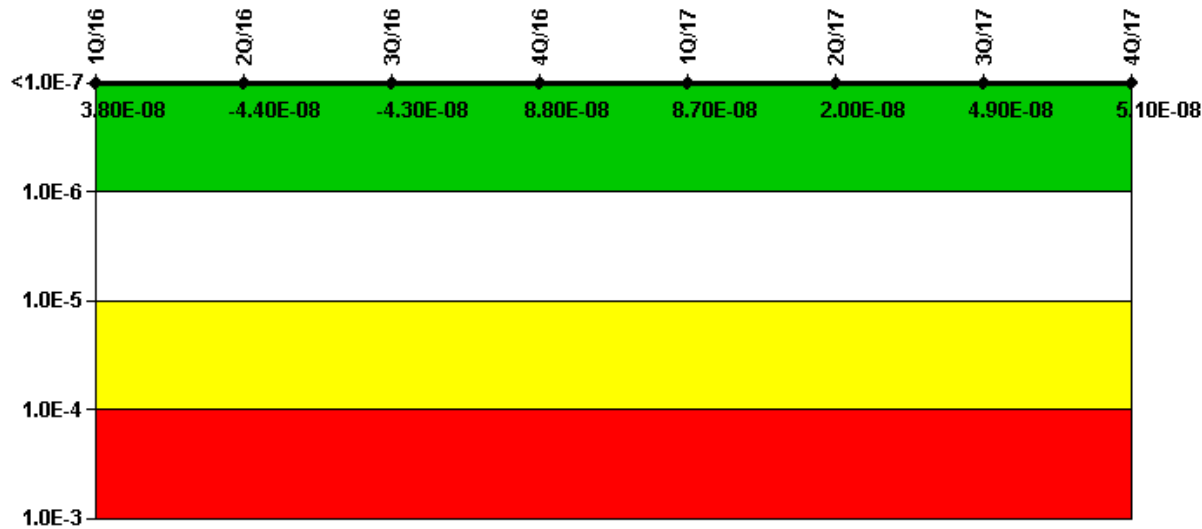
4Q/17: Changed PRA Parameter(s). PRA values were update due to basis document change due to scope change on Cooling Water ERCW headers being added.

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

4Q/16: The CAFTA PRA Model for Watts Bar Revision 2 was approved on 9/30/16 and corresponding MSPI Basis Document Revision

11 was approved on 01/18/17. The PRA model revision was a periodic update to incorporate system design changes. As a result of the PRA model change, the CDF, Fussel-Vesely and Basic Event Probabilities for all monitored trains and components were revised. The 1A and 1B D/G planned maintenance base line was changed based upon a preventative maintenance activity (7 day tank inspection) that is performed once every 10 years in the first quarter 2017. This activity is tracked and will be removed from the baseline in 12 quarters. MS08 change file is due to run hours were incorrectly entered in 1st Qty 2015 for the Terry Turbine Train. The run hours were supposed to be to the Motor Driven. The correct changes were made. No affect on Color for MS08. MS09 change file is due to small number of unavailability hours that was not entered in 1st Quarter 2015. No affect on Color for MS09.
 4Q/16: Changed PRA Parameter(s). PRA model update with MSPI basis document revision. Comment will be submitted with NRC submittal

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/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (ΔCDF)	3.69E-08	1.98E-08	2.04E-08	2.60E-08	2.52E-08	1.73E-08	1.72E-08	1.58E-08
URI (ΔCDF)	1.14E-09	-6.35E-08	-6.35E-08	6.18E-08	6.14E-08	2.53E-09	3.17E-08	3.57E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	3.80E-08	-4.40E-08	-4.30E-08	8.80E-08	8.70E-08	2.00E-08	4.90E-08	5.10E-08

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Licensee Comments:

4Q/17: Changed PRA Parameter(s). PRA values were update due to basis document change due to scope change on Cooling Water ERCW headers being added.

3Q/17: Changed PRA Parameter(s).

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

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

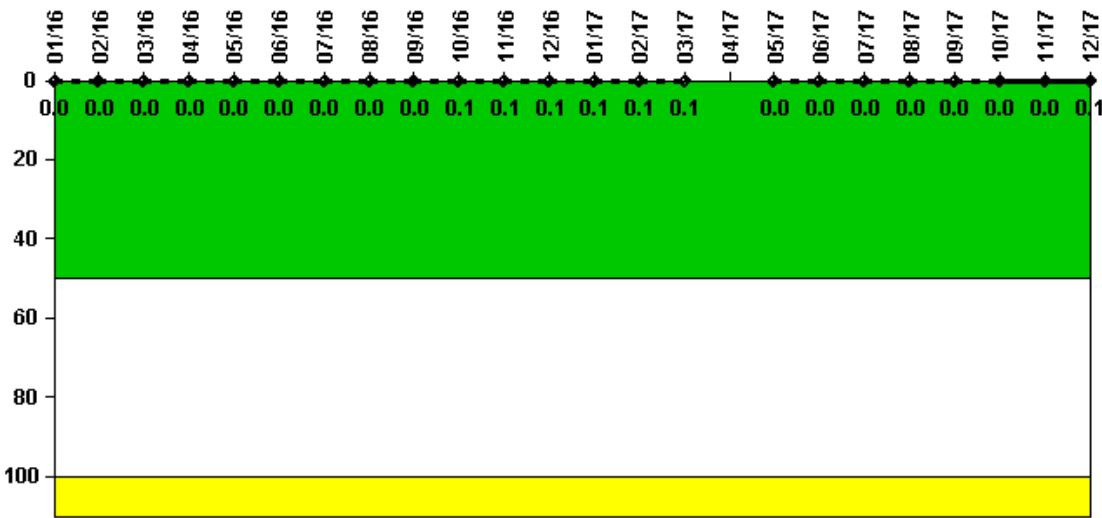
1Q/17: Changed PRA Parameter(s).

4Q/16: Changed PRA Parameter(s). PRA model update with MSPI basis document revision. Comment will be submitted with NRC submittal

2Q/16: Changed PRA Parameter(s). A MSPI basis document revision R9 and INPO CDE were update to add a cooling water unavailability segment for 2nd Quarter 2016. Before this change the segment was excluded from unavailability monitoring because the basis document concluded that it could not be taken out of service without plant shutdown as specified in NEI 99-02. During a review this quarter the header was determined to be able to be removed. The new segment was added to the Component Cooling Water as 1B header and appropriate data added. The effect of MSPI values in the past are insignificant because this header is not removed from service for planned maintenance due to the high on line risk (making multiple B train ECCS equipment unavailable). No unavailable was entered for the last 36 months. CJW

1Q/16: Changed PRA Parameter(s).

Reactor Coolant System Activity



Thresholds: White > 50.0 Yellow > 100.0

Notes

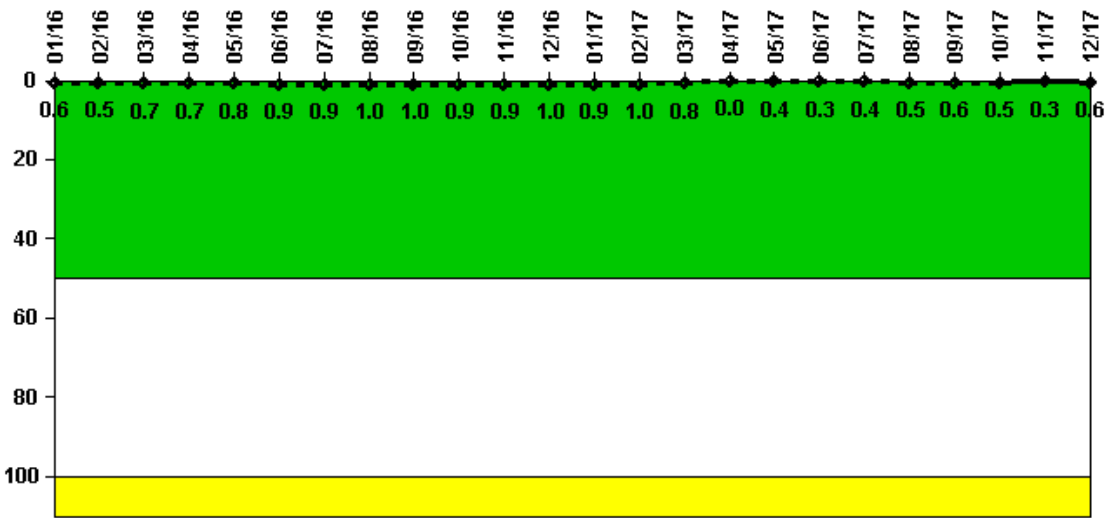
Reactor Coolant System Activity	1/16	2/16	3/16	4/16	5/16	6/16	7/16	8/16	9/16	10/16	11/16	12/16
Maximum activity	0.000094	0.000098	0.000106	0.000109	0.000115	0.000112	0.000111	0.000116	0.000127	0.000135	0.000187	0.000157
Technical specification limit	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3
Indicator value	0	0	0	0	0	0	0	0	0	0.1	0.1	0.1
Reactor Coolant System Activity	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17	10/17	11/17	12/17
Maximum activity	0.000161	0.000239	0.000161	N/A	0.000086	0.000090	0.000104	0.000098	0.000105	0.000117	0.000115	0.000141
Technical specification limit	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3	0.3

Indicator value 0.1 0.1 0.1 N/A 0 0 0 0 0 0 0 0.1

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Licensee Comments: none

Reactor Coolant System Leakage



Thresholds: White > 50.0 Yellow > 100.0

Notes

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	0.060	0.050	0.070	0.070	0.080	0.090	0.090	0.100	0.100	0.090	0.090	0.100
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

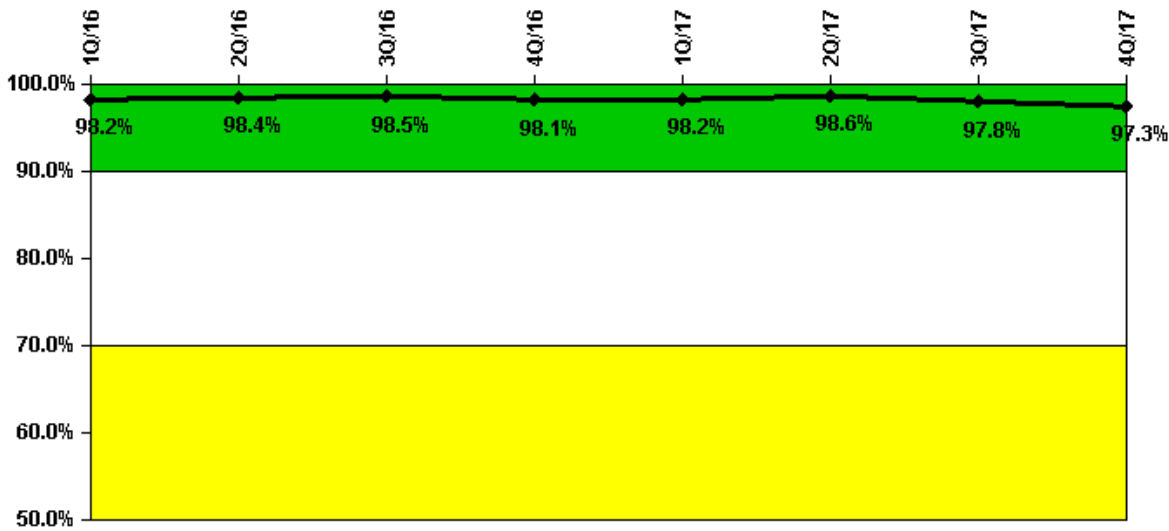
Indicator value	0.6	0.5	0.7	0.7	0.8	0.9	0.9	1.0	1.0	0.9	0.9	1.0
Reactor Coolant System Leakage	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17	10/17	11/17	12/17
Maximum leakage	0.090	0.100	0.080	0	0.040	0.030	0.040	0.050	0.060	0.050	0.030	0.060
Technical specification limit	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Indicator value 0.9 1.0 0.8 0 0.4 0.3 0.4 0.5 0.6 0.5 0.3 0.6

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Licensee Comments: none

Drill/Exercise Performance



Thresholds: White < 90.0% Yellow < 70.0%

Notes

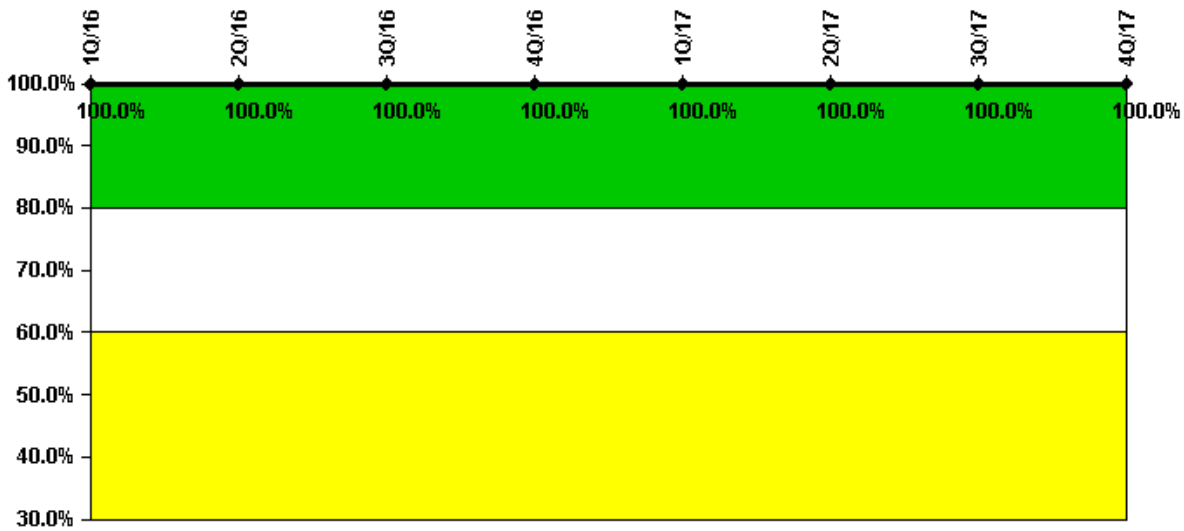
Drill/Exercise Performance	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Successful opportunities	36.0	52.0	14.0	42.0	32.0	24.0	85.0	8.0
Total opportunities	38.0	52.0	14.0	44.0	32.0	24.0	89.0	8.0

Indicator value **98.2% 98.4% 98.5% 98.1% 98.2% 98.6% 97.8% 97.3%**

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Licensee Comments: none

ERO Drill Participation



Thresholds: White < 80.0% Yellow < 60.0%

Notes

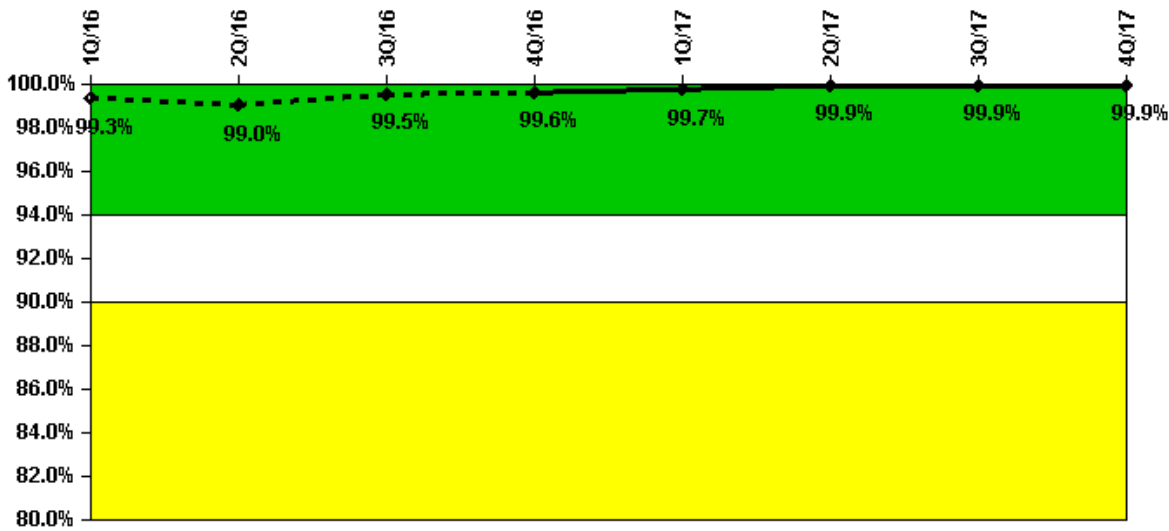
ERO Drill Participation	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Participating Key personnel	74.0	76.0	82.0	81.0	77.0	77.0	80.0	74.0
Total Key personnel	74.0	76.0	82.0	81.0	77.0	77.0	80.0	74.0

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

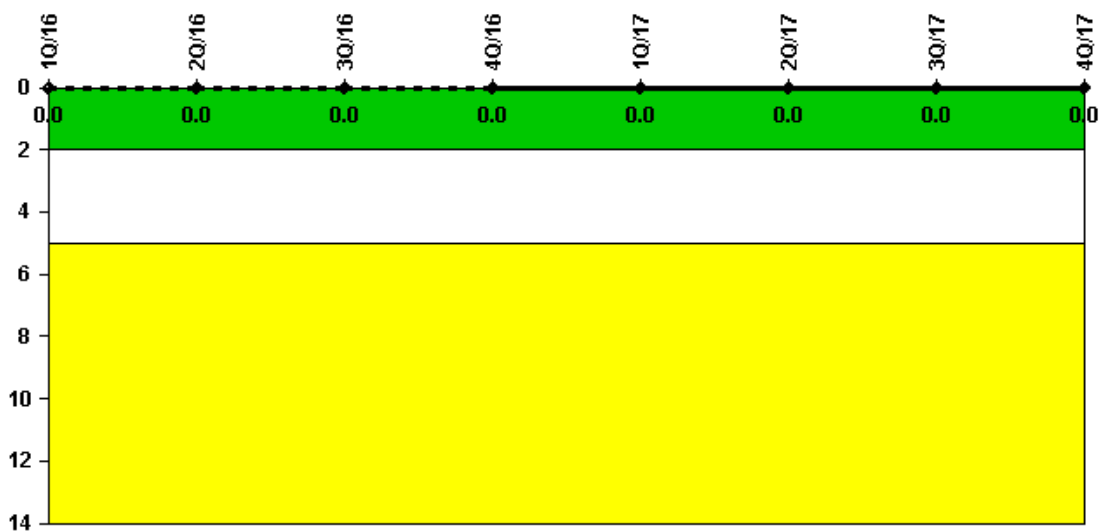
Alert & Notification System	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Successful siren-tests	906	699	805	808	909	807	807	807
Total sirens-tests	909	707	808	808	909	808	808	808

Indicator value **99.3% 99.0% 99.5% 99.6% 99.7% 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

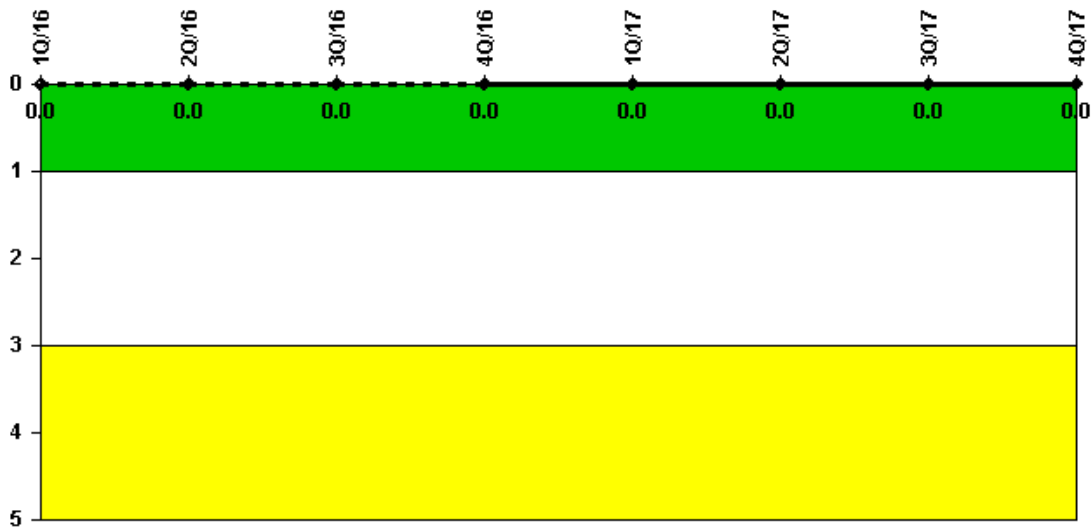
Occupational Exposure Control Effectiveness 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17 4Q/17

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
Indicator value	0	0	0	0	0	0	0	0

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Licensee Comments: none

RETS/ODCM Radiological Effluent



Thresholds: White > 1.0 Yellow > 3.0

Notes

RETS/ODCM Radiological Effluent 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17 4Q/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: February 1, 2018

Page Last Reviewed/Updated Monday, November 06, 2017