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Oconee 1 – Quarterly Performance Indicators

3Q/2017 Performance Indicators

The solid trend line represents the current reporting period.

Licensee's General Comments: none

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- Unplanned Scrams with Complications (IE04)
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- 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)
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- Alert and Notification System Reliability (EP03)
- Occupational Exposure Control Effectiveness (OR01)
- RETS/OCDM Radiological Effluent Occurrence (PR01)
- Protected Area Equipment (PP01)

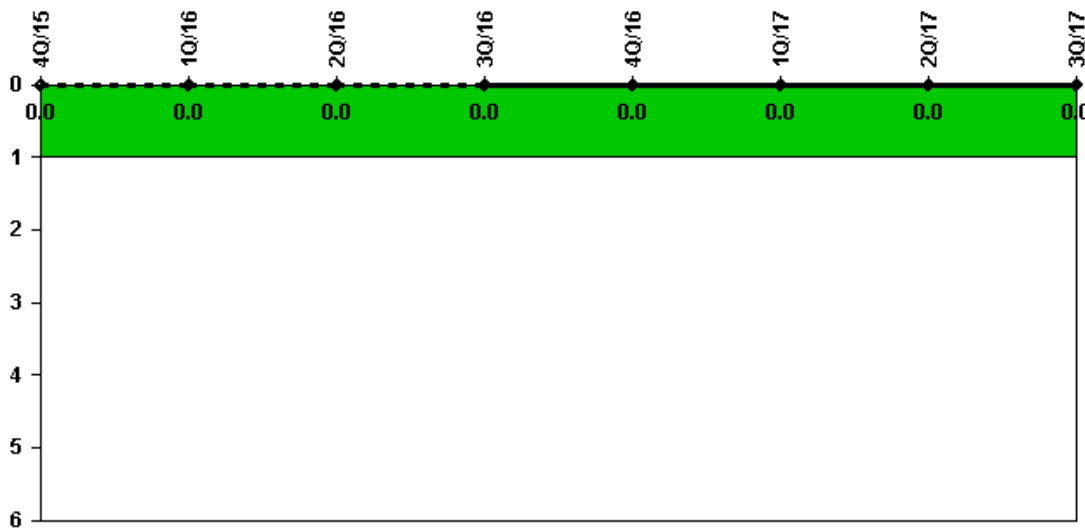
Notes

Unplanned Power Changes per 7000 Critical Hrs	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Unplanned power changes	0	1.0	0	0	0	0	0	0
Critical hours	2209.0	1648.1	2184.0	2208.0	1690.5	1988.3	2184.0	2208.0
Indicator value	0	0.8	0.8	0.8	0.9	0	0	0

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Licensee Comments: none

Unplanned Scrams with Complications



Thresholds: White > 1.0

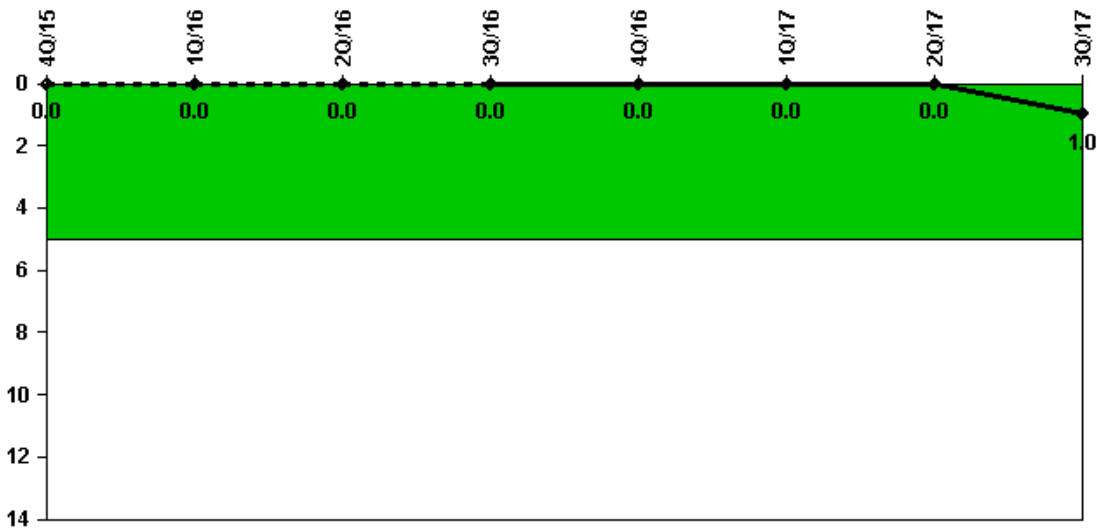
Notes

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

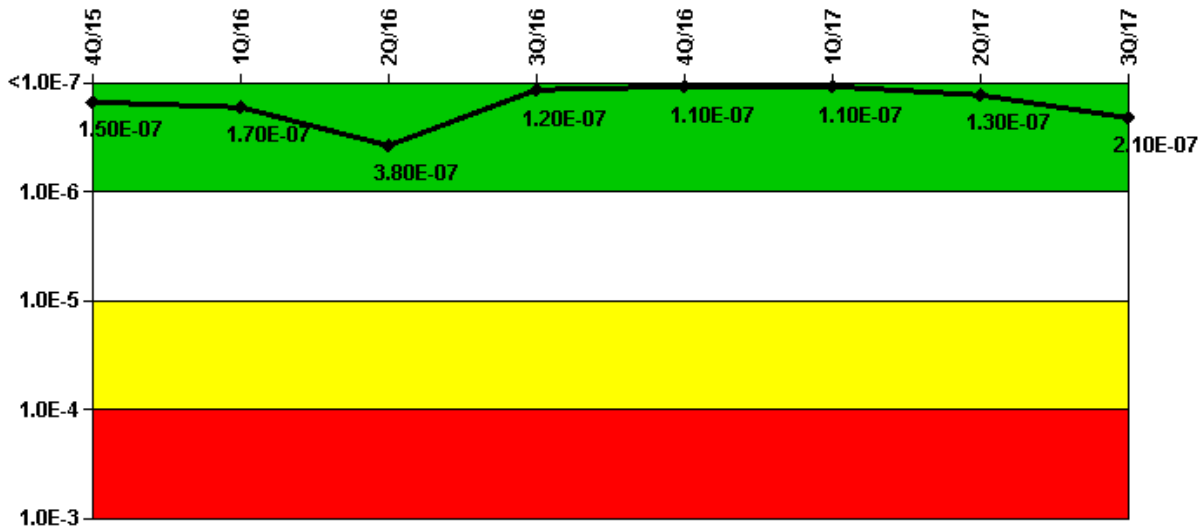
Safety System Functional Failures (PWR) 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17
 Safety System Functional Failures 0 0 0 0 0 0 0 0 1

Indicator value 0 0 0 0 0 0 0 0 1

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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

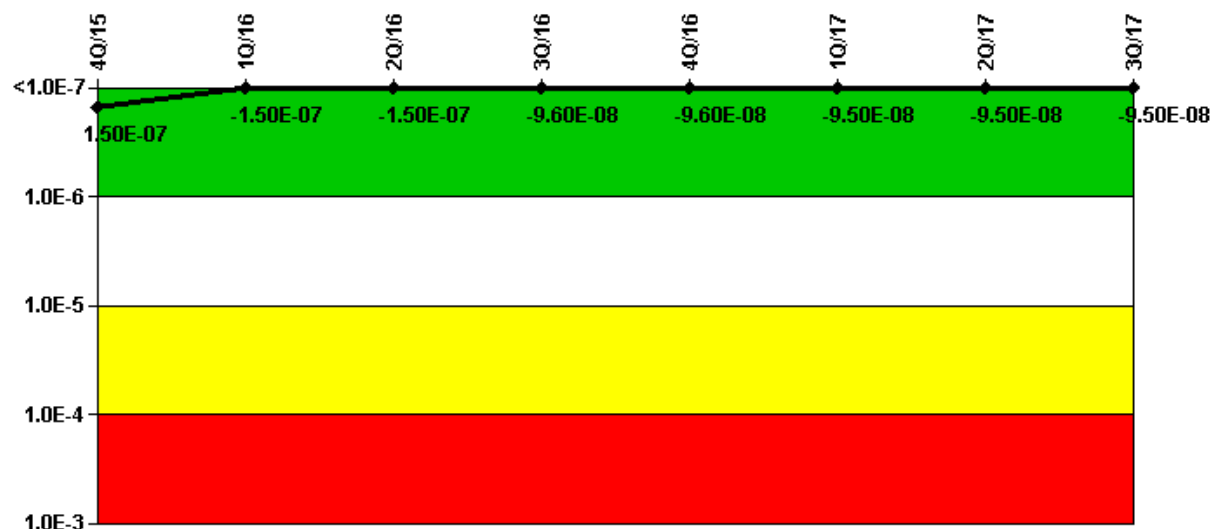
	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
UAI (ΔCDF)	1.92E-07	2.10E-07	2.07E-07	9.54E-08	1.41E-07	1.40E-07	1.55E-07	2.41E-07
URI (ΔCDF)	-4.30E-08	-4.30E-08	1.75E-07	2.76E-08	-2.84E-08	-2.84E-08	-2.84E-08	-2.84E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	1.50E-07	1.70E-07	3.80E-07	1.20E-07	1.10E-07	1.10E-07	1.30E-07	2.10E-07

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Licensee Comments:

4Q/16: Changed PRA Parameter(s). The following comments should have been included with the Oconee third quarter submittal. The Oconee Units 1, 2, and 3 PRA Model, Revision 7, was approved on 4/1/16, and a corresponding MSPI Basis Document Revision 18 was approved on 10/6/16. 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 changes were entered into CDE on 10/6/16, and the changes are effective for third quarter 2016.
 3Q/16: Changed PRA Parameter(s). Planned UA Baseline was updated to be applied to 4th quarter 2016 per revised MSPI Basis Document.

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)	-1.72E-10	-6.37E-10	-3.76E-10	-3.23E-10	-2.15E-10	2.39E-10	1.41E-11	1.32E-10
URI (ΔCDF)	1.50E-07	-1.51E-07	-1.51E-07	-9.53E-08	-9.53E-08	-9.53E-08	-9.53E-08	-9.53E-08

PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	1.50E-07	-1.50E-07	-1.50E-07	-9.60E-08	-9.60E-08	-9.50E-08	-9.50E-08	-9.50E-08

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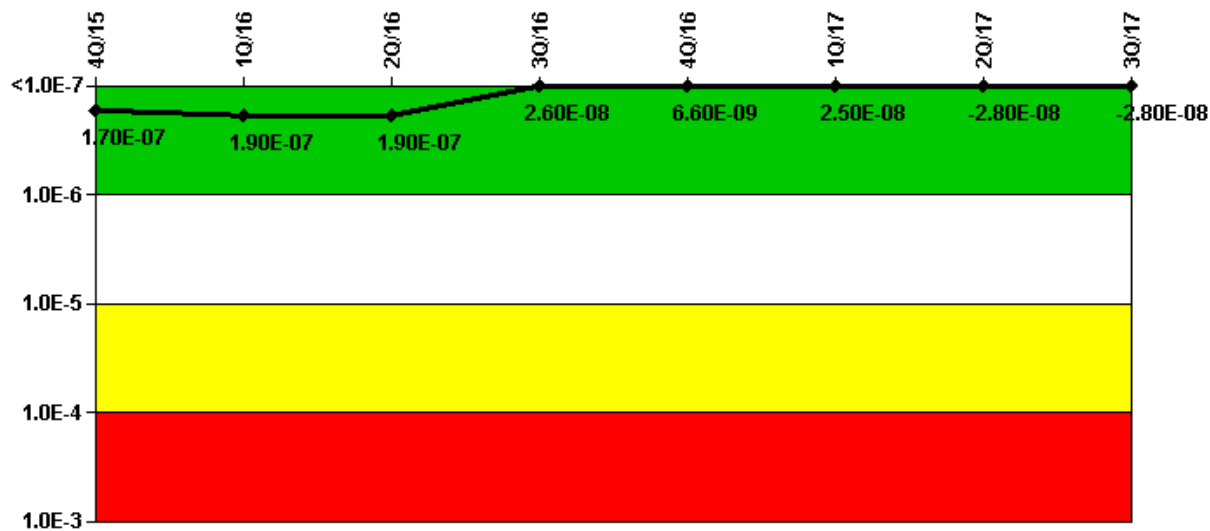
Licensee Comments:

3Q/17: The estimates of motor-operated valve (MOV) demands for the High Pressure Injection (HPI) system were updated. The baseline changes were incorporated into the MSPI Basis Document Revision 23, dated 9/27/17. The changes were entered into CDE on 10/2/17 and will be effective for fourth quarter 2017.

4Q/16: Changed PRA Parameter(s). The following comments should have been included with the Oconee third quarter submittal. The Oconee Units 1, 2, and 3 PRA Model, Revision 7, was approved on 4/1/16, and a corresponding MSPI Basis Document Revision 18 was approved on 10/6/16. 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 changes were entered into CDE on 10/6/16, and the changes are effective for third quarter 2016. The planned unavailability baseline for the high pressure injection (HPI) system was revised and the baseline changes were incorporated into the PRA model and the MSPI Basis Document Revision 18. The changes were entered into CDE on 10/6/16 and will be effective in the first quarter of 2017. Also, consistent with the PRA model changes, the B HPI pumps for all Oconee units were added as MSPI monitored components. The MSPI Basis Document revision 19 was approved on 10/18/16 to incorporate these changes, and the corresponding changes were entered into CDE on October 18-19, 2016. The changes are effective for the third quarter 2016.

3Q/16: 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)	2.48E-07	2.70E-07	2.71E-07	7.74E-08	5.76E-08	7.59E-08	2.30E-08	2.34E-08
URI (ΔCDF)	-8.07E-08	-8.07E-08	-8.07E-08	-5.10E-08	-5.10E-08	-5.10E-08	-5.10E-08	-5.10E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO

Indicator value

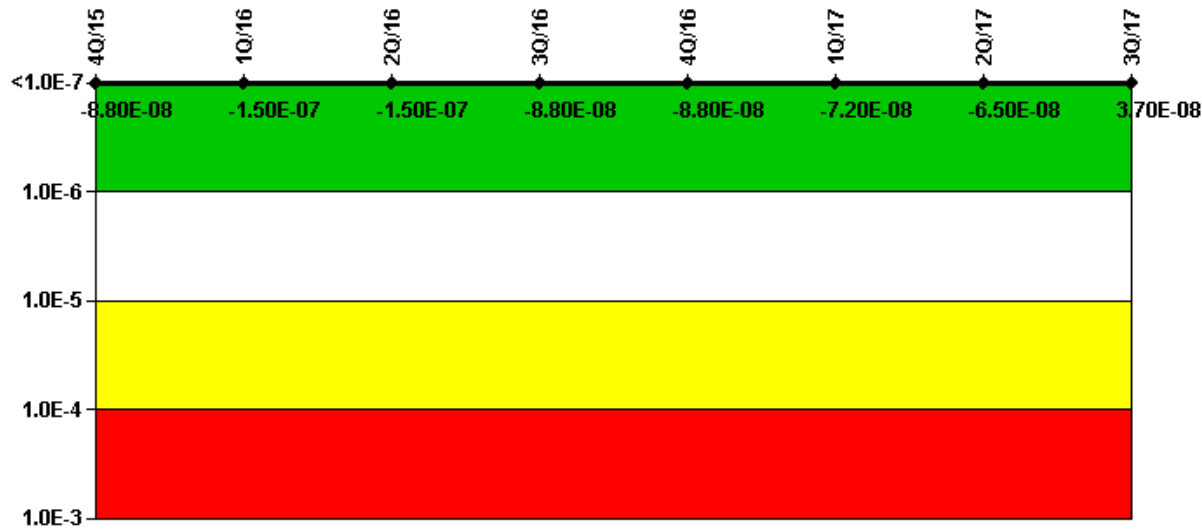
1.70E-07 1.90E-07 1.90E-07 2.60E-08 6.60E-09 2.50E-08 -2.80E-08 -2.80E-08

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Licensee Comments:

4Q/16: Changed PRA Parameter(s). The following comments should have been included with the Oconee third quarter submittal. The Oconee Units 1, 2, and 3 PRA Model, Revision 7, was approved on 4/1/16, and a corresponding MSPI Basis Document Revision 18 was approved on 10/6/16. 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 changes were entered into CDE on 10/6/16, and the changes are effective for third quarter 2016.
 3Q/16: 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)	2.34E-08	-3.35E-08	-3.39E-08	-2.39E-08	-2.39E-08	-8.17E-09	-1.11E-09	1.01E-07
URI (ΔCDF)	-1.12E-07	-1.12E-07	-1.12E-07	-6.36E-08	-6.36E-08	-6.36E-08	-6.36E-08	-6.36E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-8.80E-08	-1.50E-07	-1.50E-07	-8.80E-08	-8.80E-08	-7.20E-08	-6.50E-08	3.70E-08

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Licensee Comments:

3Q/17: The estimates of pump demands for the Residual Heat Removal (RHR) system were updated. The baseline changes were incorporated into the MSPI Basis Document Revision 23, dated 9/27/17. The changes were entered into CDE on 10/2/17 and will be effective for fourth quarter 2017.

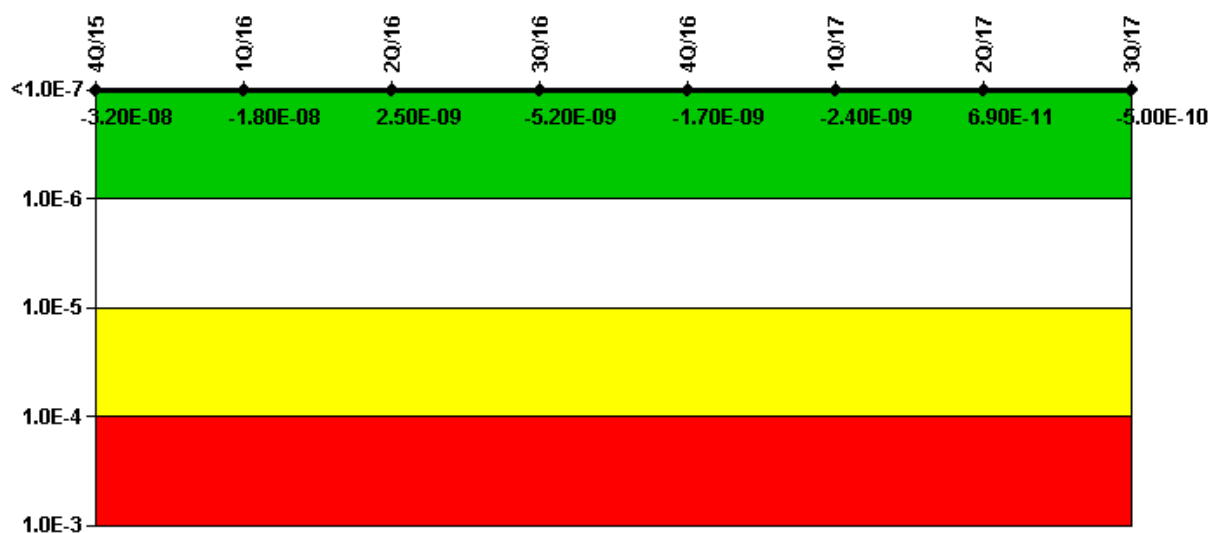
2Q/17: The planned unavailability baseline for the residual heat removal (RHR) system was revised to remove UA hours that were previously added due to significant maintenance evolutions that are performed at an interval greater than the 3-year monitoring period.

The maintenance evolutions have rolled off the 3-year monitoring period. The baseline changes were incorporated into the MSPI Basis Document Revision 22, dated 5/2/17. The changes are bounded by the existing PRA model, so a PRA model update is not required. The changes were entered into CDE effective third quarter 2017.

4Q/16: Changed PRA Parameter(s). The following comments should have been included with the Oconee third quarter submittal. The Oconee Units 1, 2, and 3 PRA Model, Revision 7, was approved on 4/1/16, and a corresponding MSPI Basis Document Revision 18 was approved on 10/6/16. 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 changes were entered into CDE on 10/6/16, and the changes are effective for third quarter 2016. The planned unavailability baseline for the residual heat removal (RHR) system was revised and the baseline changes were incorporated into the PRA model and the MSPI Basis Document Revision 18. The changes were entered into CDE on 10/6/16 and will be effective in the first quarter of 2017.

3Q/16: 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)	-2.35E-09	1.19E-08	3.25E-08	5.66E-09	9.11E-09	8.37E-09	1.09E-08	1.03E-08
URI (ΔCDF)	-3.00E-08	-3.00E-08	-3.00E-08	-1.08E-08	-1.08E-08	-1.08E-08	-1.08E-08	-1.08E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-3.20E-08	-1.80E-08	2.50E-09	-5.20E-09	-1.70E-09	-2.40E-09	6.90E-11	-5.00E-10

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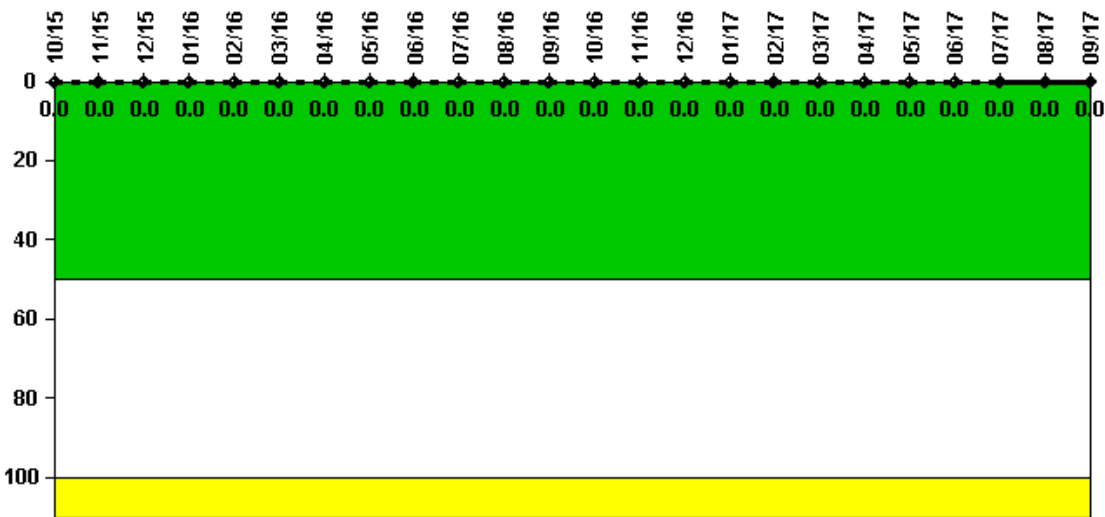
Licensee Comments:

4Q/16: Changed PRA Parameter(s). The following comments should have been included with the Oconee third quarter submittal. The Oconee Units 1, 2, and 3 PRA Model, Revision 7, was approved on 4/1/16, and a corresponding MSPI Basis Document Revision 18 was approved on 10/6/16. 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 changes were entered into CDE on 10/6/16, and the changes are effective for third quarter 2016.

On 10/19/16, risk metrics for the Cooling Water System were recalculated using the method described for making corrections to FV/UA and FV/UR ratios for fault trees using modeling method 2 as described in NEI 99-02. The MSPi Basis Document revision 20 was approved on 10/19/16, and the corresponding changes were entered into CDE on 10/19/16. The changes are effective for the third quarter 2016.

3Q/16: 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	0.000157	0.000163	0.000156	0.000171	0.000196	0.000118	0.000156	0.000230	0.000157	0.000245	0.000193	0.000177
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

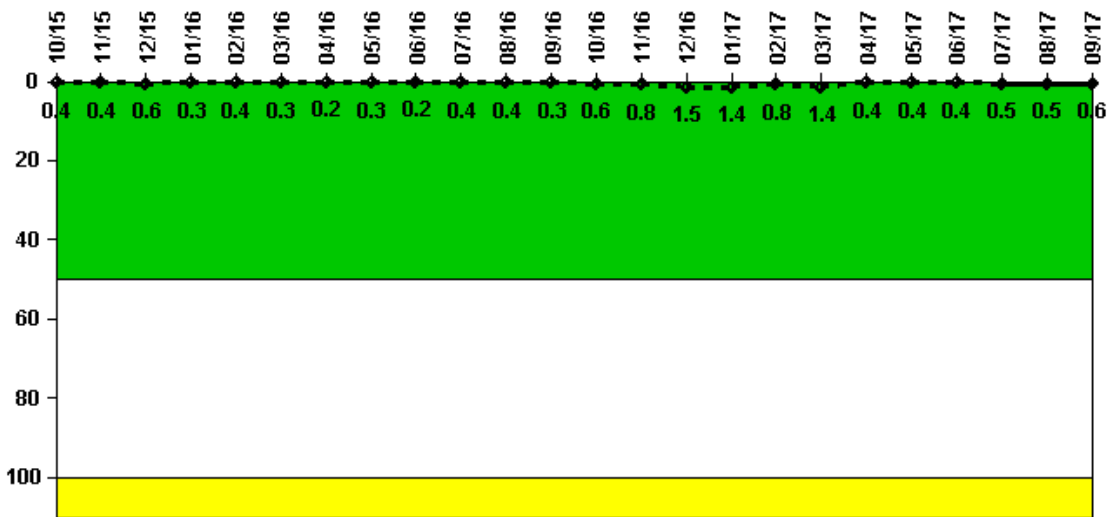
Reactor Coolant System Activity	10/16	11/16	12/16	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17
Maximum activity	0.000218	0.000206	0.000084	0.000270	0.000152	0.000149	0.000123	0.000127	0.000108	0.000104	0.000136	0.000135
Technical specification limit	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Indicator value 0 0 0 0 0 0 0 0 0 0 0 0 0

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Licensee Comments: none

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	0.038	0.035	0.061	0.026	0.038	0.031	0.023	0.028	0.021	0.036	0.036	0.034
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

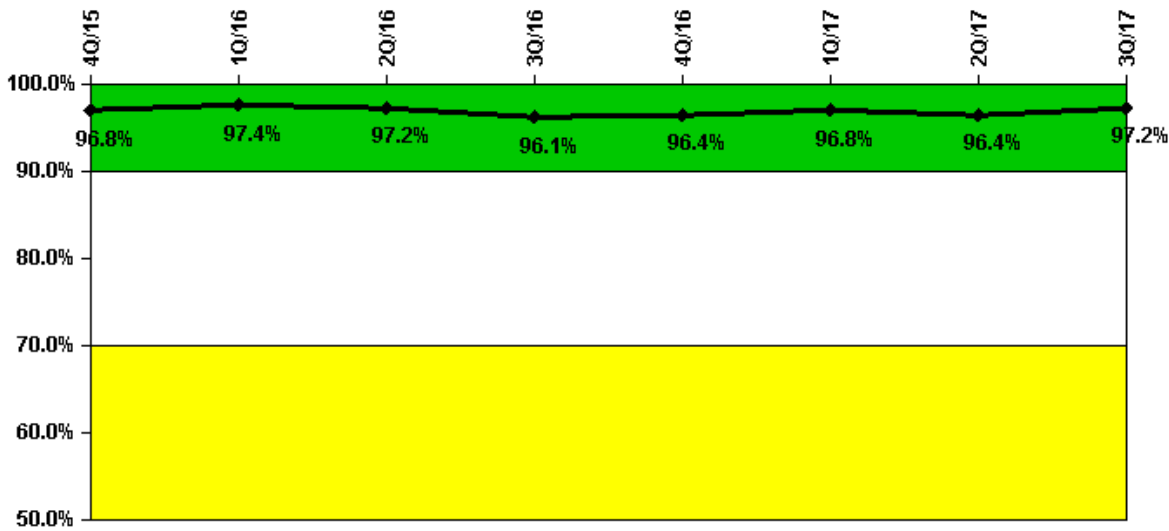
Indicator value	0.4	0.4	0.6	0.3	0.4	0.3	0.2	0.3	0.2	0.4	0.4	0.3
Reactor Coolant System Leakage	10/16	11/16	12/16	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17
Maximum leakage	0.063	0.075	0.151	0.141	0.079	0.135	0.038	0.042	0.038	0.045	0.047	0.055
Technical specification limit	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Indicator value	0.6	0.8	1.5	1.4	0.8	1.4	0.4	0.4	0.4	0.5	0.5	0.6
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Licensee Comments: none

Drill/Exercise Performance



Thresholds: White < 90.0% Yellow < 70.0%

Notes

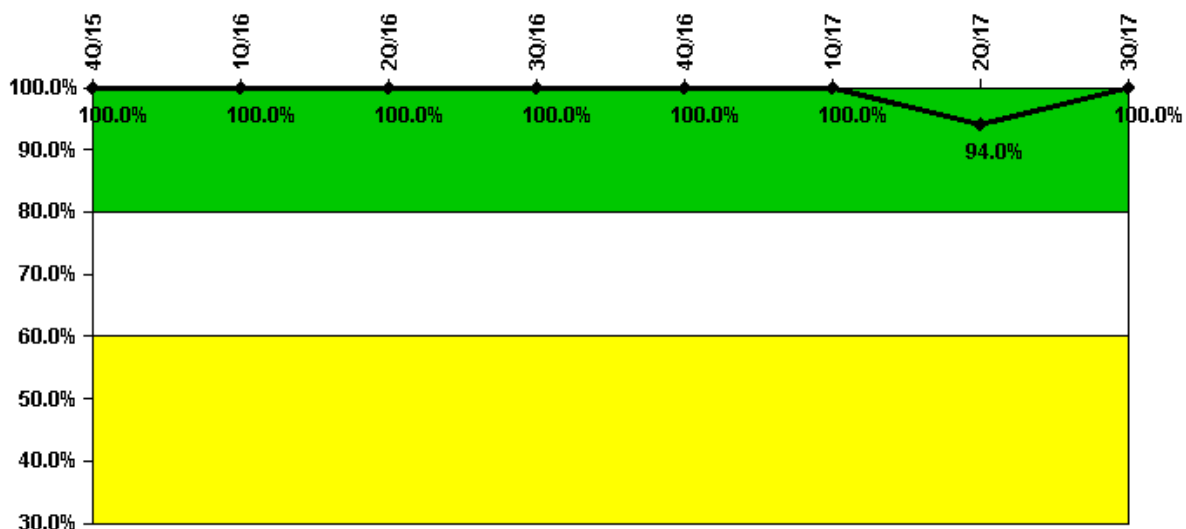
Drill/Exercise Performance	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Successful opportunities	52.0	63.0	25.0	39.0	10.0	11.0	0	43.0
Total opportunities	54.0	63.0	26.0	43.0	10.0	11.0	0	43.0

Indicator value **96.8% 97.4% 97.2% 96.1% 96.4% 96.8% 96.4% 97.2%**

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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	129.0	124.0	129.0	130.0	129.0	129.0	126.0	139.0
Total Key personnel	129.0	124.0	129.0	130.0	129.0	129.0	134.0	139.0

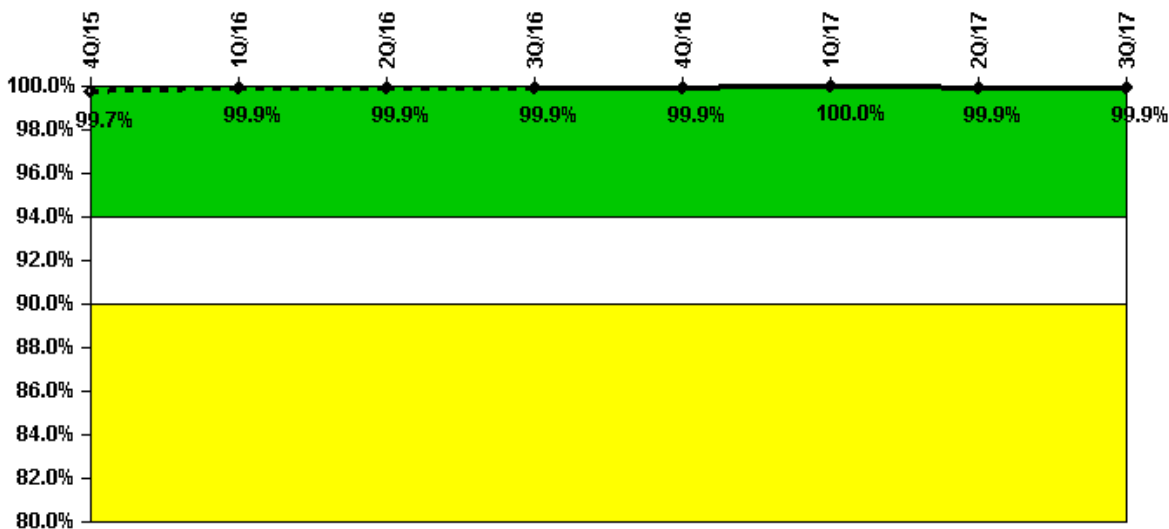
Indicator value **100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 94.0% 100.0%**

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Licensee Comments:

3Q/17: The ERO Participation PI Data for 2nd Quarter 2017 has been updated and is different than previously reported. This update did not result in a color change for the performance indicator.

Alert & Notification System



Thresholds: White < 94.0% Yellow < 90.0%

Notes

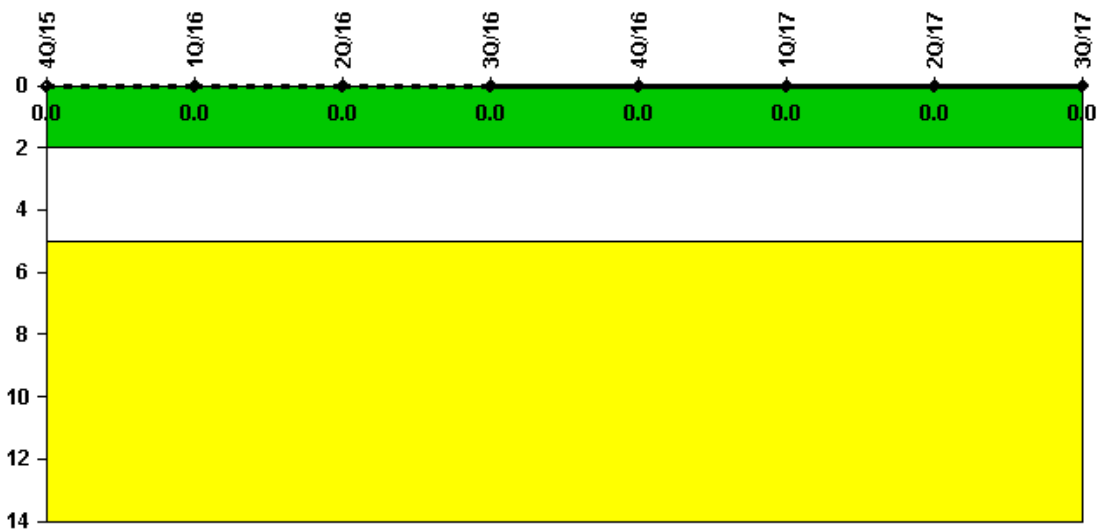
Alert & Notification System	4Q/15	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17
Successful siren-tests	1817	1752	1754	1754	1727	1754	1753	1686
Total sirens-tests	1820	1755	1755	1755	1727	1755	1755	1690

Indicator value **99.7% 99.9% 99.9% 99.9% 99.9% 100.0% 99.9% 99.9%**

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Licensee Comments: none

Occupational Exposure Control Effectiveness



Thresholds: White > 2.0 Yellow > 5.0

Notes

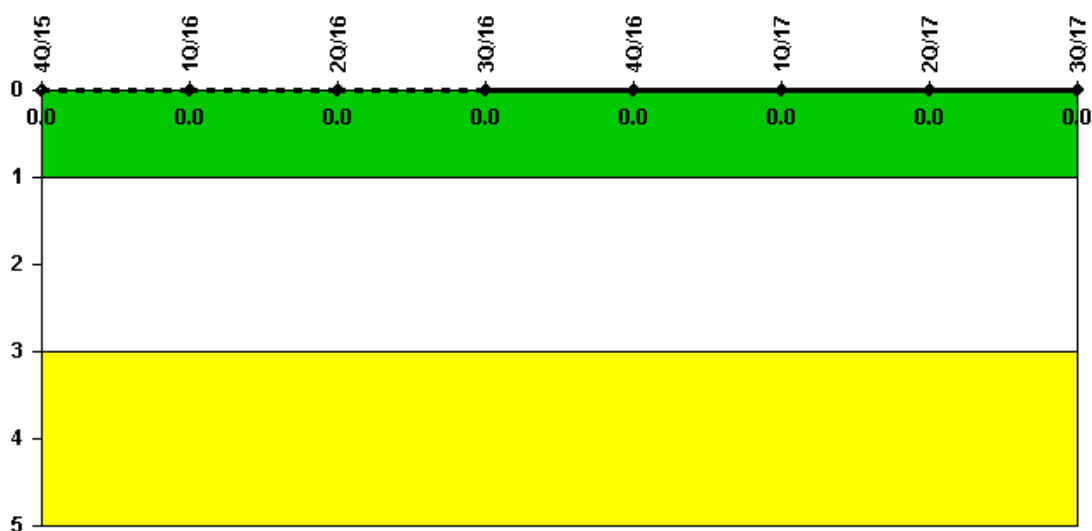
Occupational Exposure Control Effectiveness 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17

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
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 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