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## Browns Ferry 3 – Quarterly Performance Indicators

### 4Q/2017 Performance Indicators

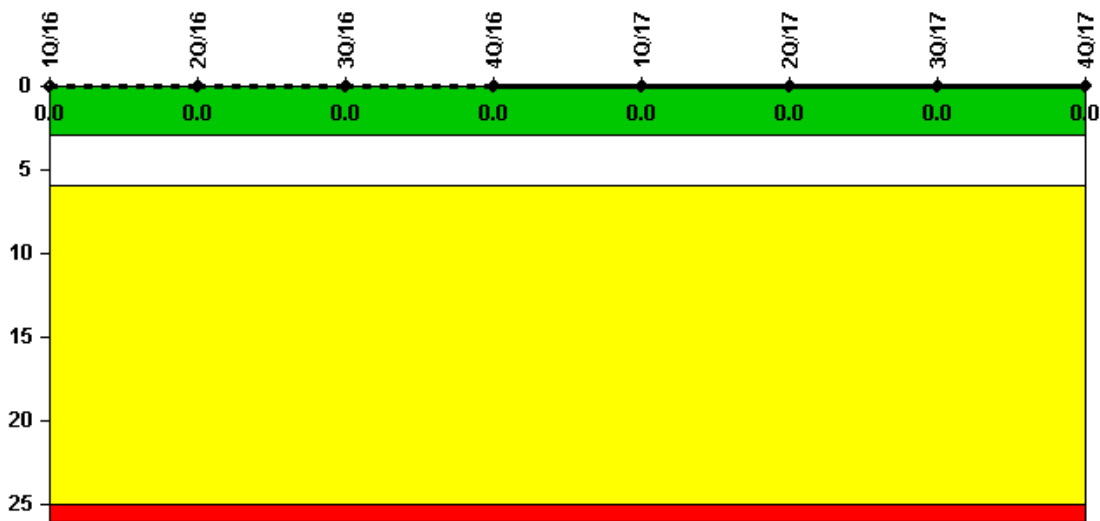
The solid trend line represents the current reporting period.

Licensee's General Comments: none

On this page:

- Unplanned Scrams (IE01)
- Unplanned Power Changes per 7000 Critical Hours (IE03)
- Unplanned Scrams with Complications (IE04)
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- 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**

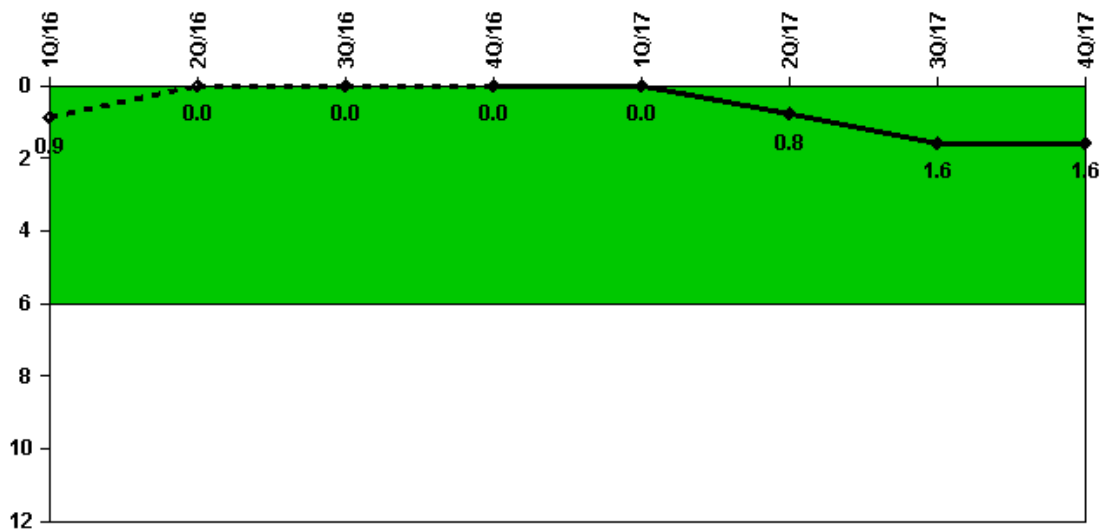
Unplanned Scrams per 7000 Critical Hrs	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Unplanned scrams	0	0	0	0	0	0	0	0
Critical hours	1327.5	2184.0	2208.0	2209.0	2159.0	2184.0	2208.0	2209.0

Indicator value	0	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>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>	<b>4Q/17</b>
Unplanned power changes	0	0	0	0	0	1.0	1.0	0
Critical hours	1327.5	2184.0	2208.0	2209.0	2159.0	2184.0	2208.0	2209.0
<b>Indicator value</b>	<b>0.9</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0</b>	<b>0.8</b>	<b>1.6</b>	<b>1.6</b>

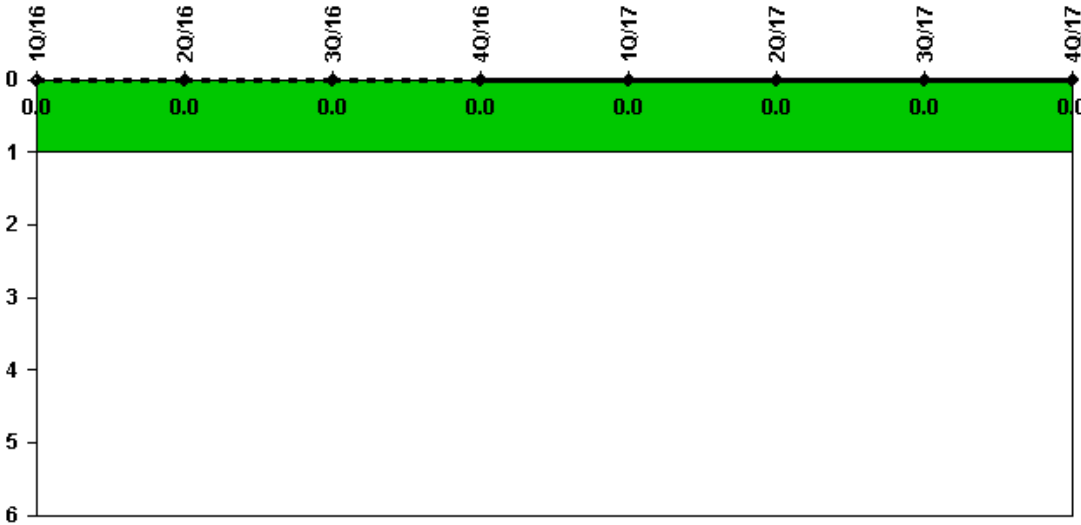
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Licensee Comments:

2Q/17: Data for April 2016 was changed due to counting excluded hours as included hours. No color change occurred as a result of this data change.

2Q/16: Data for April 2016 was changed due to counting excluded hours as included hours. No color change occurred as a result of this data change.

**Unplanned Scrams with Complications**



Thresholds: White > 1.0

**Notes**

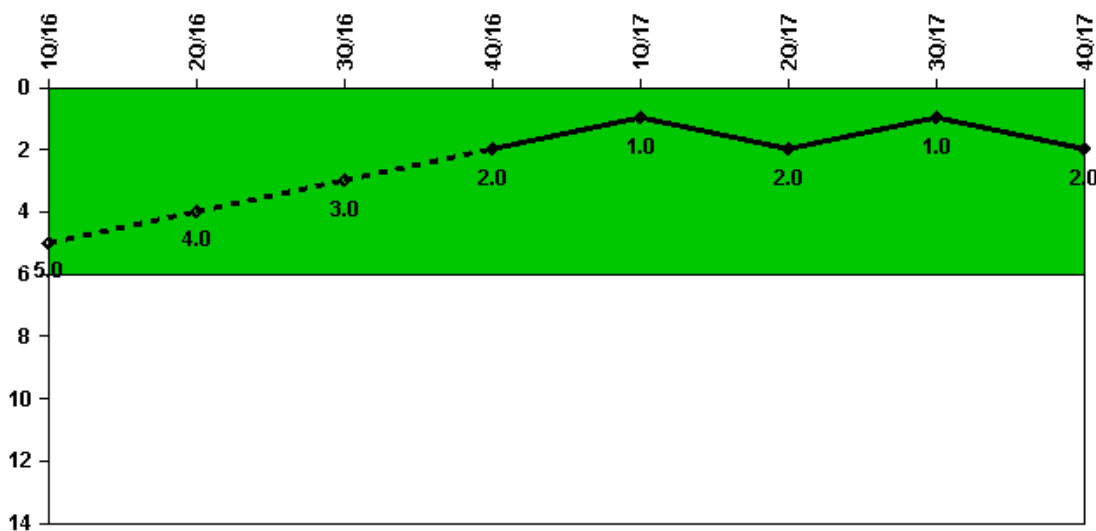
<b>Unplanned Scrams with Complications</b>	<b>1Q/16</b>	<b>2Q/16</b>	<b>3Q/16</b>	<b>4Q/16</b>	<b>1Q/17</b>	<b>2Q/17</b>	<b>3Q/17</b>	<b>4Q/17</b>
Scrams with complications	0	0	0	0	0	0	0	0

<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 (BWR)



Thresholds: White > 6.0

**Notes**

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

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

Indicator value    5    4    3    2    1    2    1    2

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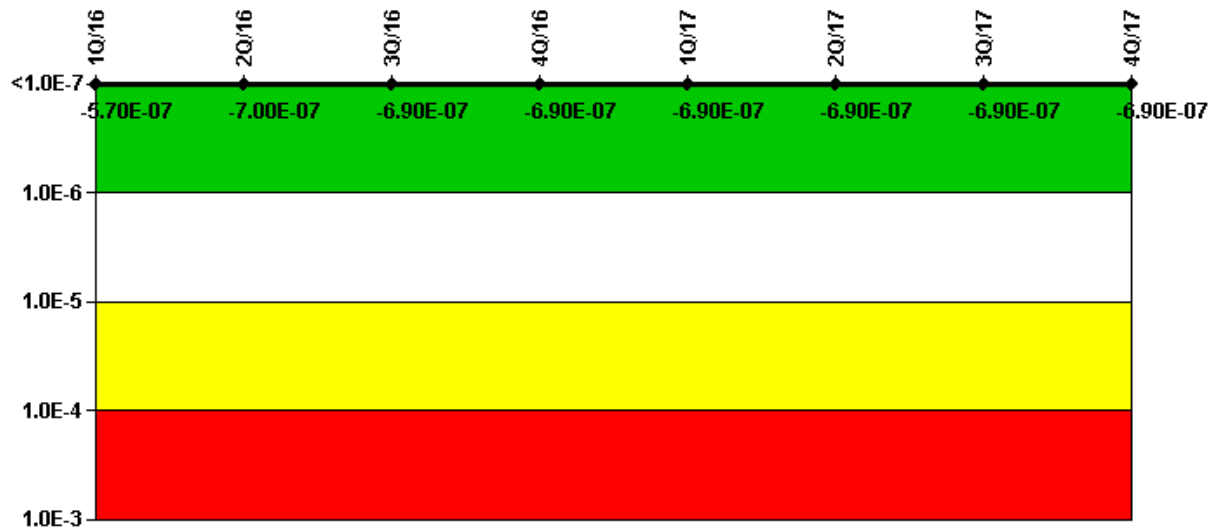
Licensee Comments:

2Q/17: LER 50-259/2017-003-00 - Unanalyzed Condition for Tornado Missiles Striking the Emergency Diesel Generator Fuel Oil Vent Lines

3Q/16: LER 50-296/2016-006-00: High Pressure Coolant Injection System Found to be Inoperable During Testing

1Q/16: LER 296/2016-001-00 : Inoperable Residual Heat Removal Pump Results in Condition Prohibited by Technical Specifications and Safety System Functional Failure

### 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)	3.06E-08	-3.78E-08	-3.78E-08	-3.78E-08	-3.78E-08	-3.78E-08	-3.78E-08	-3.78E-08
URI (ΔCDF)	-6.04E-07	-6.65E-07	-6.51E-07	-6.51E-07	-6.51E-07	-6.51E-07	-6.51E-07	-6.51E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-5.70E-07</b>	<b>-7.00E-07</b>	<b>-6.90E-07</b>	<b>-6.90E-07</b>	<b>-6.90E-07</b>	<b>-6.90E-07</b>	<b>-6.90E-07</b>	<b>-6.90E-07</b>

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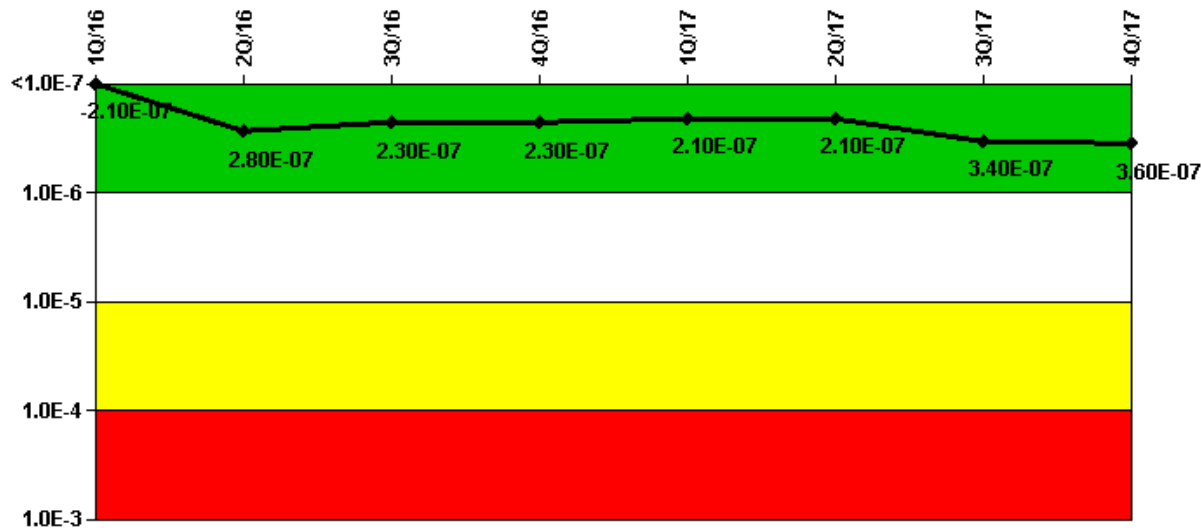
Licensee Comments:

4Q/16: Changed PRA Parameter(s). NDN-000-999-2010-0003 Revision 12 was updated to show the Failure to Run and Failure to Start basic event importances in each of the tables per CR 1110732-001. The Unit 3 MSPI Basis Document Revision 16 was approved on 9/30/2016 to reflect that change. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised to reflect the change. Additionally, this revision incorporates the changes to the EECW System Description as required by CR 1202022.

3Q/16: Changed PRA Parameter(s). The MSPI Basis documents for all three units were revised to incorporate PRA changes. The PRA was updated to show the Failure to Run and Failure to Start basic event importance in each of the tables. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Section F 2.3.3. Previously, Option 1 as described in NEI 99-02 F2.3.3, was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, and RHRSW were revised.

2Q/16: Unit 3: The CAFTA PRA Model Revision 7 was approved on 03/29/2016 with a corresponding MSPI Basis Document Revision 15 approved on 3/31/2016. The PRA model revision was a periodic update to the model which included a data update, HRA update and incorporating recent plant modifications. As a result of the PRA model change, the CDF, Fussel-Vesely and Basic Event Probabilities for all monitored trains and components were revised.

### 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)	-3.25E-08	-3.18E-09	-2.74E-09	-2.57E-09	-2.66E-08	-2.67E-08	1.10E-07	1.25E-07
URI (ΔCDF)	-1.79E-07	2.83E-07	2.35E-07	2.35E-07	2.35E-07	2.35E-07	2.35E-07	2.35E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-2.10E-07</b>	<b>2.80E-07</b>	<b>2.30E-07</b>	<b>2.30E-07</b>	<b>2.10E-07</b>	<b>2.10E-07</b>	<b>3.40E-07</b>	<b>3.60E-07</b>

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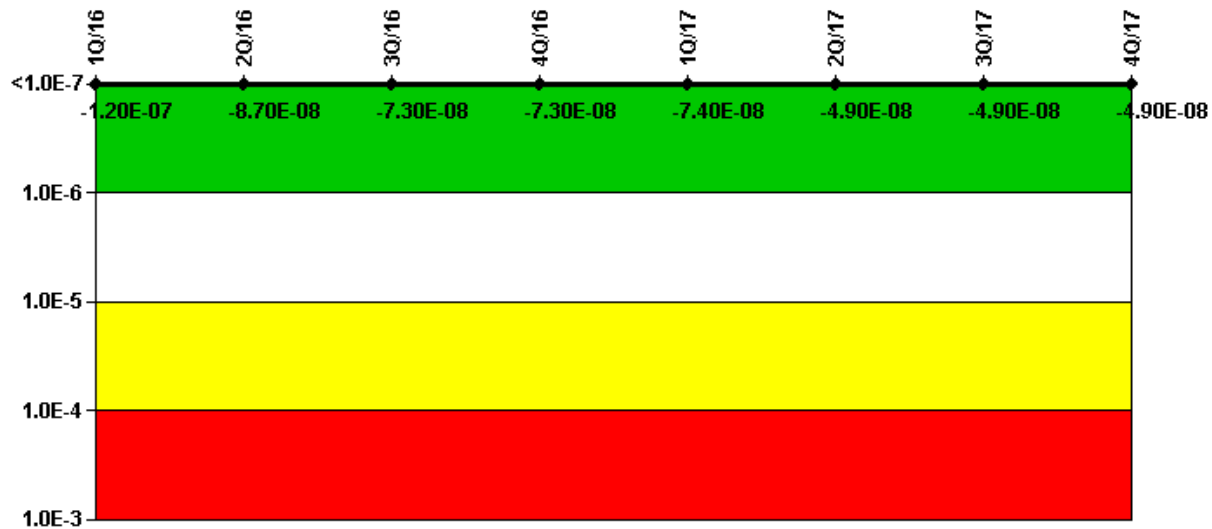
Licensee Comments:

4Q/16: Changed PRA Parameter(s). NDN-000-999-2010-0003 Revision 12 was updated to show the Failure to Run and Failure to Start basic event importances in each of the tables per CR 1110732-001. The Unit 3 MSPI Basis Document Revision 16 was approved on 9/30/2016 to reflect that change. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised to reflect the change. Additionally, this revision incorporates the changes to the EECW System Description as required by CR 1202022.

3Q/16: Changed PRA Parameter(s). The MSPI Basis documents for all three units were revised to incorporate PRA changes. The PRA was updated to show the Failure to Run and Failure to Start basic event importance in each of the tables. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 as described in NEI 99-02 F2.3.3, was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised.

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### 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)	1.65E-08	-1.64E-08	-1.22E-08	-1.24E-08	-1.35E-08	1.19E-08	1.17E-08	1.20E-08
URI (ΔCDF)	-1.40E-07	-7.10E-08	-6.08E-08	-6.08E-08	-6.08E-08	-6.08E-08	-6.08E-08	-6.08E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-1.20E-07</b>	<b>-8.70E-08</b>	<b>-7.30E-08</b>	<b>-7.30E-08</b>	<b>-7.40E-08</b>	<b>-4.90E-08</b>	<b>-4.90E-08</b>	<b>-4.90E-08</b>

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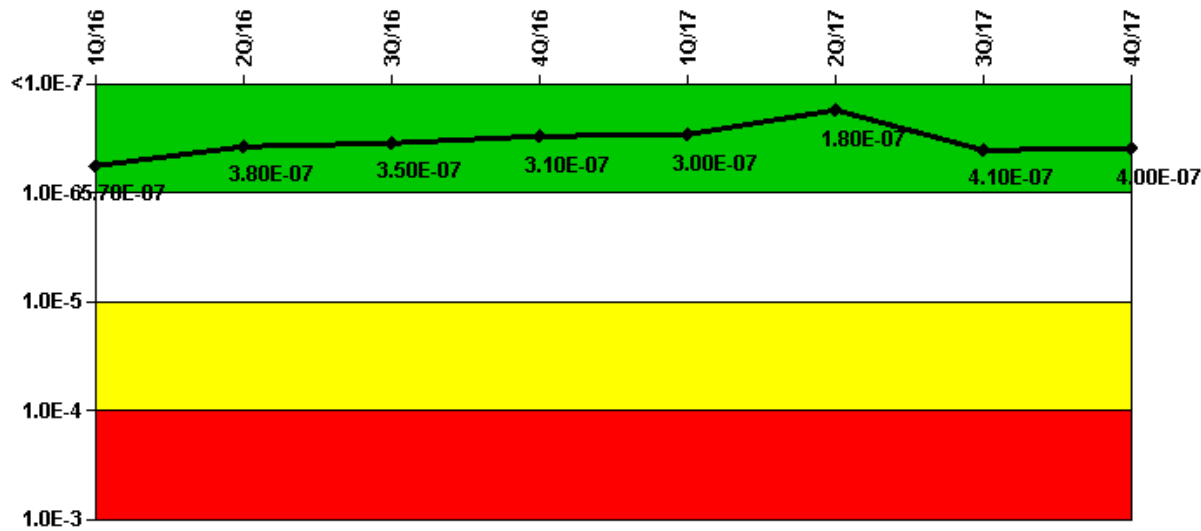
Licensee Comments:

4Q/16: Changed PRA Parameter(s). NDN-000-999-2010-0003 Revision 12 was updated to show the Failure to Run and Failure to Start basic event importances in each of the tables per CR 1110732-001. The Unit 3 MSPI Basis Document Revision 16 was approved on 9/30/2016 to reflect that change. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised to reflect the change. Additionally, this revision incorporates the changes to the EECW System Description as required by CR 1202022.

3Q/16: Changed PRA Parameter(s). The MSPI Basis documents for all three units were revised to incorporate PRA changes. The PRA was updated to show the Failure to Run and Failure to Start basic event importance in each of the tables. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 as described in NEI 99-02 F2.3.3, was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised.

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### 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)	7.77E-08	1.03E-07	7.57E-08	3.60E-08	2.79E-08	-3.63E-09	1.01E-07	9.18E-08
URI (ΔCDF)	4.93E-07	2.73E-07	2.73E-07	2.73E-07	2.73E-07	1.82E-07	3.06E-07	3.06E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>5.70E-07</b>	<b>3.80E-07</b>	<b>3.50E-07</b>	<b>3.10E-07</b>	<b>3.00E-07</b>	<b>1.80E-07</b>	<b>4.10E-07</b>	<b>4.00E-07</b>

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Licensee Comments:

4Q/16: Changed PRA Parameter(s). NDN-000-999-2010-0003 Revision 12 was updated to show the Failure to Run and Failure to Start basic event importances in each of the tables per CR 1110732-001. The Unit 3 MSPI Basis Document Revision 16 was approved on 9/30/2016 to reflect that change. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised to reflect the change. Additionally, this revision incorporates the changes to the EECW System Description as required by CR 1202022.

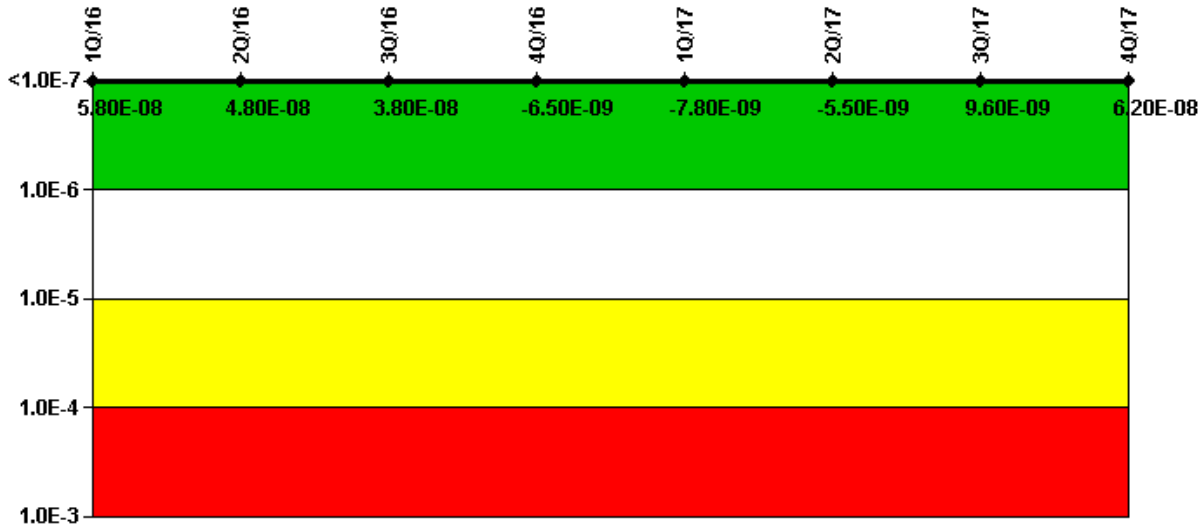
3Q/16: Changed PRA Parameter(s). The MSPI Basis documents for all three units were revised to incorporate PRA changes. The PRA was updated to show the Failure to Run and Failure to Start basic event importance in each of the tables. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 as described in NEI 99-02 F2.3.3, was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised.

2Q/16: Unit 3: The CAFTA PRA Model Revision 7 was approved on 03/29/2016 with a corresponding MSPI Basis Document Revision 15 approved on 3/31/2016. The PRA model revision was a periodic update to the model which included a data update, HRA update and incorporating recent plant modifications. As a result of the PRA model change, the CDF, Fussel-Vesely and Basic Event Probabilities for all monitored trains and components were revised.

1Q/16: Changed due to additional planned unavailability on RHR system piping flushing activities in December 2015. Change does not affect color of indicator.



### 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)	1.08E-07	7.73E-08	6.62E-08	2.19E-08	2.06E-08	2.29E-08	2.29E-08	7.53E-08
URI (ΔCDF)	-5.02E-08	-2.89E-08	-2.84E-08	-2.84E-08	-2.84E-08	-2.84E-08	-1.34E-08	-1.34E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>5.80E-08</b>	<b>4.80E-08</b>	<b>3.80E-08</b>	<b>-6.50E-09</b>	<b>-7.80E-09</b>	<b>-5.50E-09</b>	<b>9.60E-09</b>	<b>6.20E-08</b>

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Licensee Comments:

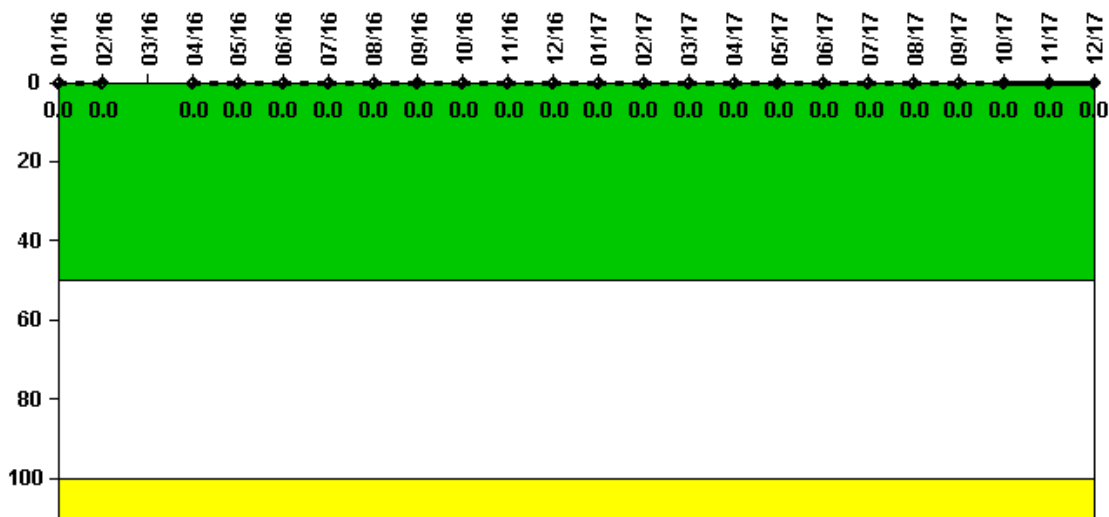
3Q/17: Changed PRA Parameter(s).

4Q/16: Changed PRA Parameter(s). NDN-000-999-2010-0003 Revision 12 was updated to show the Failure to Run and Failure to Start basic event importances in each of the tables per CR 1110732-001. The Unit 3 MSPI Basis Document Revision 16 was approved on 9/30/2016 to reflect that change. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised to reflect the change. Additionally, this revision incorporates the changes to the EECW System Description as required by CR 1202022.

3Q/16: Changed PRA Parameter(s). The MSPI Basis documents for all three units were revised to incorporate PRA changes. The PRA was updated to show the Failure to Run and Failure to Start basic event importance in each of the tables. This change allows the use of Option 2 to determine the FV/UR ratio as described in NEI 99-02, Appendix F 2.3.3. Previously, Option 1 as described in NEI 99-02 F2.3.3, was used with other ratio options shown with a strikethrough. The PRA UnR tables for EDG, HPCI, RCIC, RHR, and RHRSW were revised.

2Q/16: Changed PRA Parameter(s). Unit 3: The CAFTA PRA Model Revision 7 was approved on 03/29/2016 with a corresponding MSPI Basis Document Revision 15 approved on 3/31/2016. The PRA model revision was a periodic update to the model which included a data update, HRA update and incorporating recent plant modifications. As a result of the PRA model change, the CDF, Fussel-Vesely and Basic Event Probabilities for all monitored trains and components were revised.

### Reactor Coolant System Activity



Thresholds: White > 50.0 Yellow > 100.0

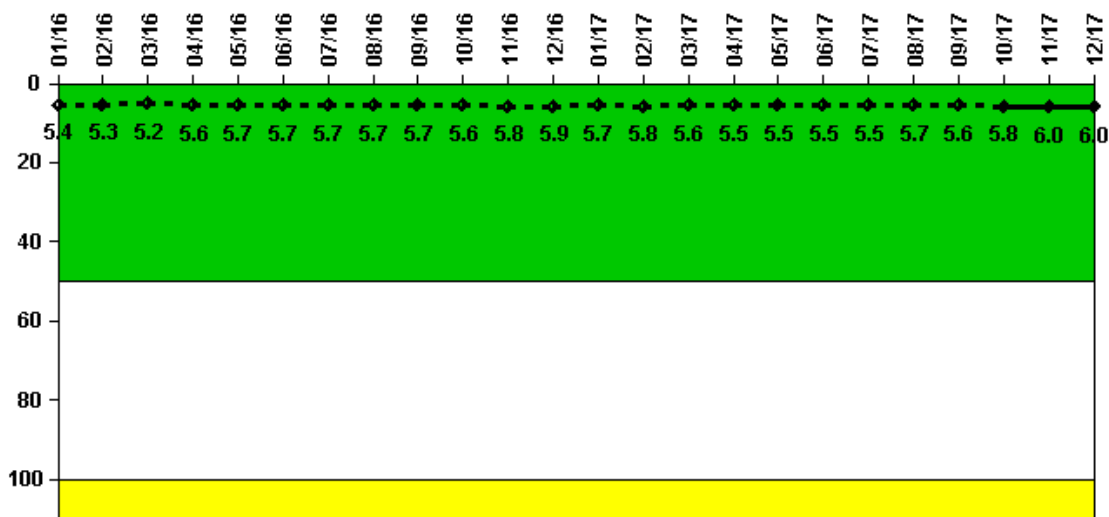
**Notes**

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	0.000033	0.000048	N/A	0.000031	0.000040	0.000037	0.000032	0.000064	0.000031	0.000029	0.000031	0.000031
Technical specification limit	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Indicator value	0	0	N/A	0	0	0	0	0	0	0	0	0
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	0.000028	0.000023	0.000037	0.000037	0.000033	0.000045	0.000033	0.000038	0.000060	0.000047	0.000061	0.000038
Technical specification limit	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2	3.2
Indicator value	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	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	1.620	1.590	1.570	1.690	1.710	1.710	1.700	1.710	1.700	1.670	1.740	1.760
Technical specification limit	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

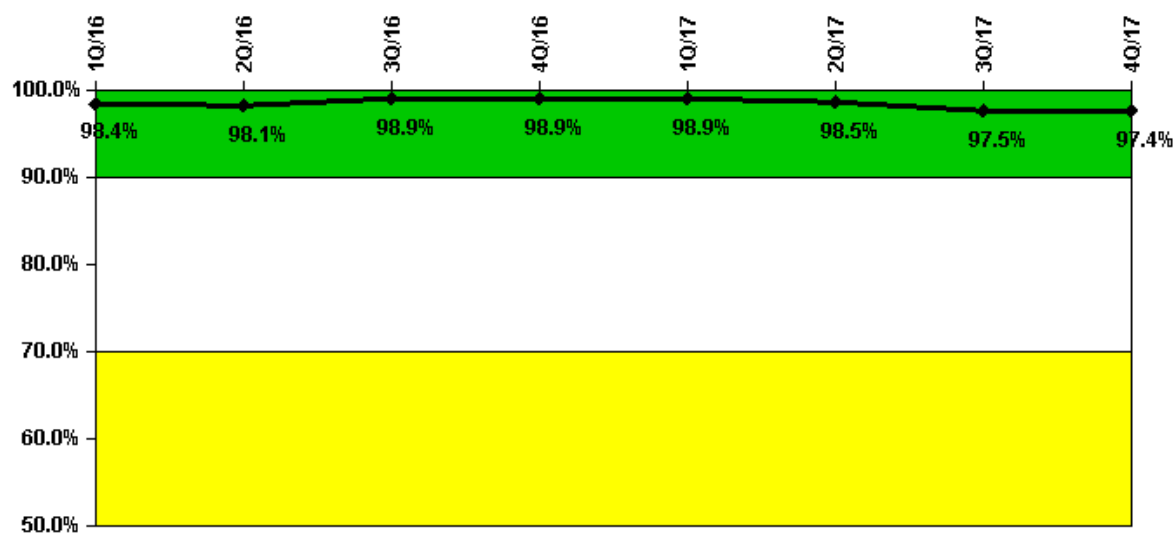
<b>Indicator value</b>	<b>5.4</b>	<b>5.3</b>	<b>5.2</b>	<b>5.6</b>	<b>5.7</b>	<b>5.7</b>	<b>5.7</b>	<b>5.7</b>	<b>5.7</b>	<b>5.6</b>	<b>5.8</b>	<b>5.9</b>
Reactor Coolant System Leakage	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17	10/17	11/17	12/17
Maximum leakage	1.720	1.730	1.670	1.650	1.650	1.660	1.650	1.700	1.680	1.740	1.810	1.810
Technical specification limit	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0	30.0

<b>Indicator value</b>	<b>5.7</b>	<b>5.8</b>	<b>5.6</b>	<b>5.5</b>	<b>5.5</b>	<b>5.5</b>	<b>5.5</b>	<b>5.7</b>	<b>5.6</b>	<b>5.8</b>	<b>6.0</b>	<b>6.0</b>
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Licensee Comments: none

### Drill/Exercise Performance



Thresholds: White < 90.0% Yellow < 70.0%

#### Notes

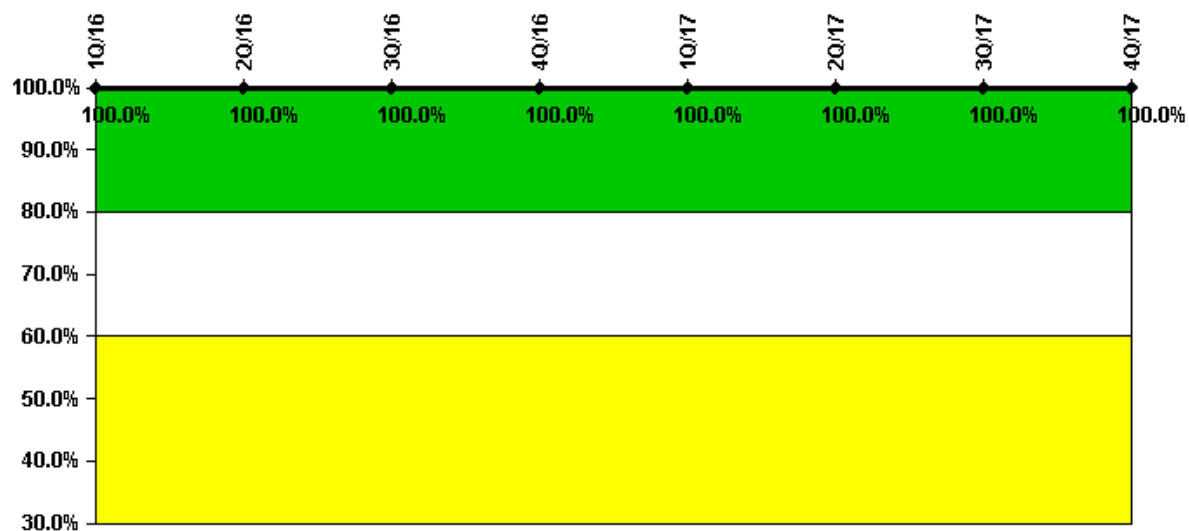
Drill/Exercise Performance	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Successful opportunities	34.0	43.0	94.0	6.0	36.0	58.0	85.0	26.0
Total opportunities	34.0	45.0	95.0	6.0	36.0	60.0	90.0	26.0

Indicator value                    98.4% 98.1% 98.9% 98.9% 98.9% 98.5% 97.5% 97.4%

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Licensee Comments: none

### ERO Drill Participation



Thresholds: White < 80.0% Yellow < 60.0%

**Notes**

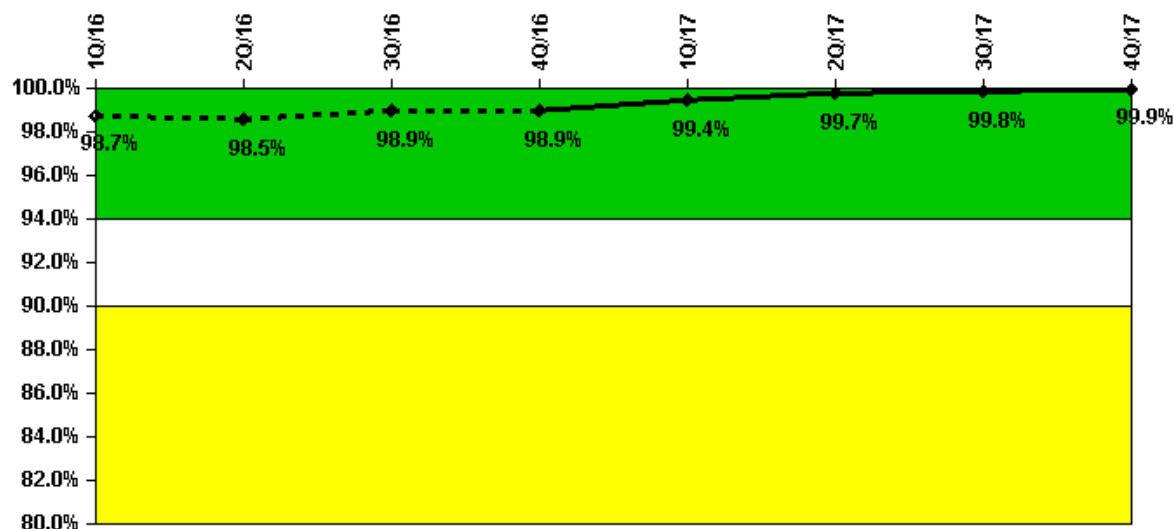
ERO Drill Participation	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Participating Key personnel	93.0	91.0	98.0	97.0	101.0	97.0	82.0	85.0
Total Key personnel	93.0	91.0	98.0	97.0	101.0	97.0	82.0	85.0

**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

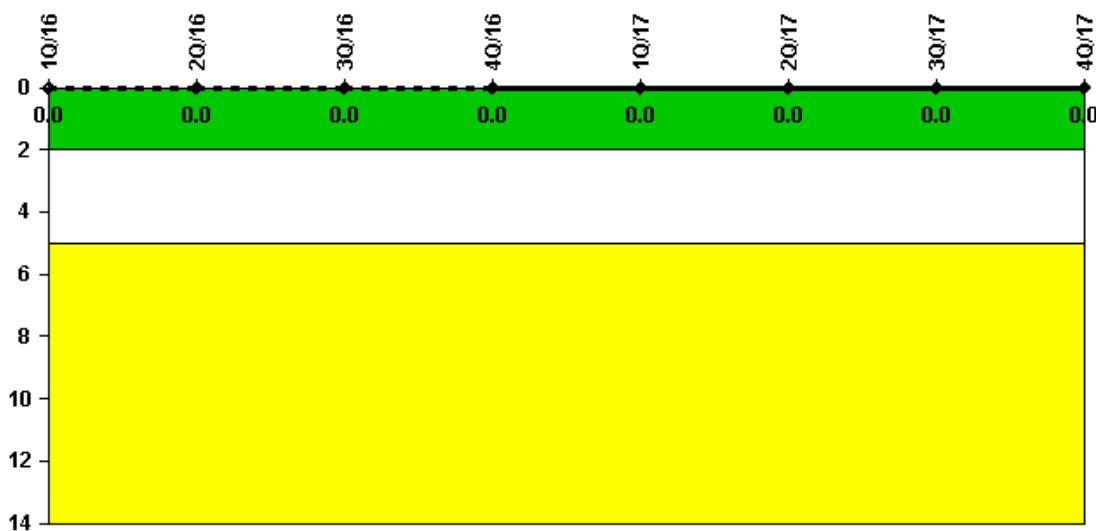
Alert & Notification System	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Successful siren-tests	881	718	932	828	831	727	832	832
Total sirens-tests	902	728	936	832	832	728	832	832

Indicator value                    98.7% 98.5% 98.9% 98.9% 99.4% 99.7% 99.8% 99.9%

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Licensee Comments: none

### Occupational Exposure Control Effectiveness



Thresholds: White > 2.0 Yellow > 5.0

**Notes**

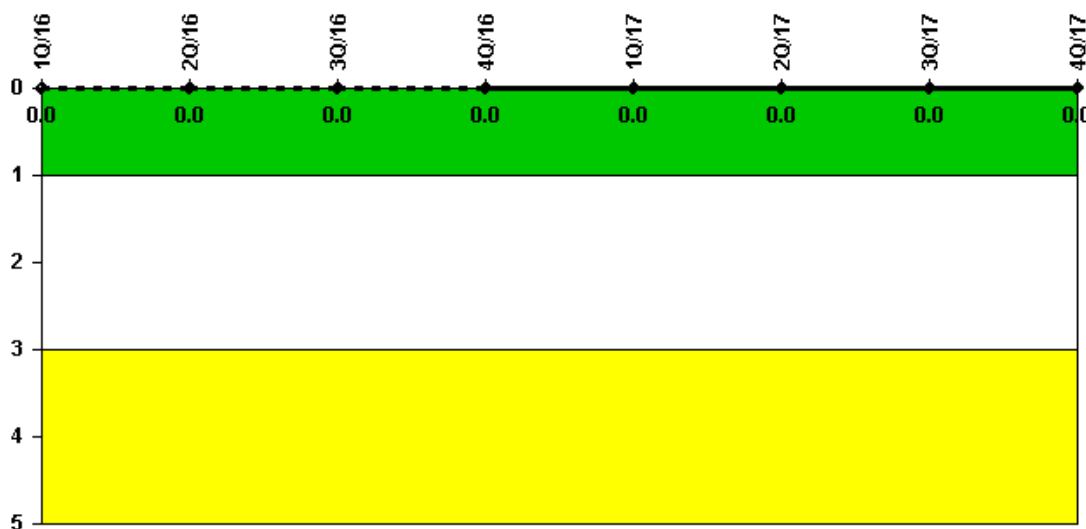
**Occupational Exposure Control Effectiveness** 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17 4Q/17

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
<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** 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*