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## Braidwood 2 – Quarterly Performance Indicators

### 4Q/2017 Performance Indicators

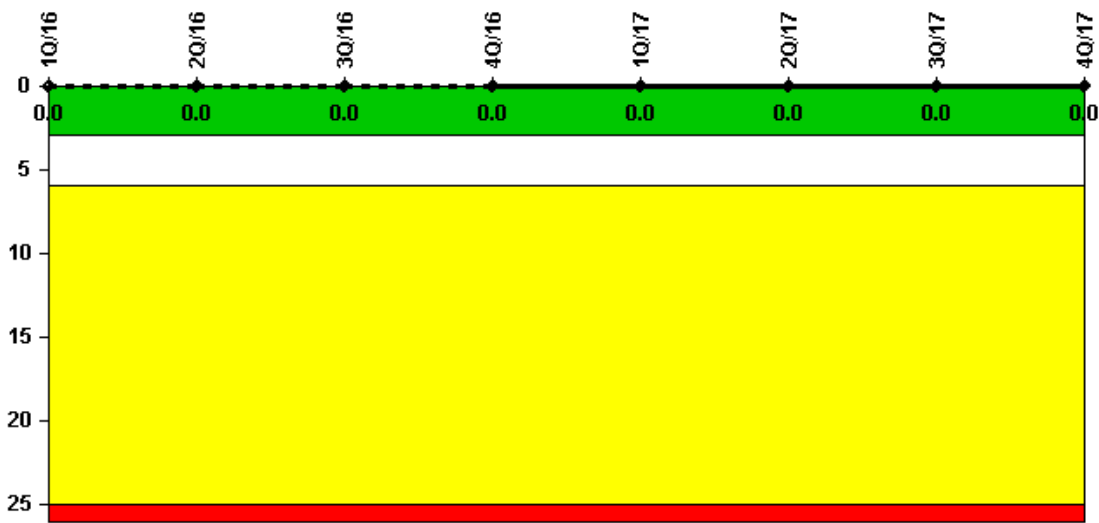
The solid trend line represents the current reporting period.

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**

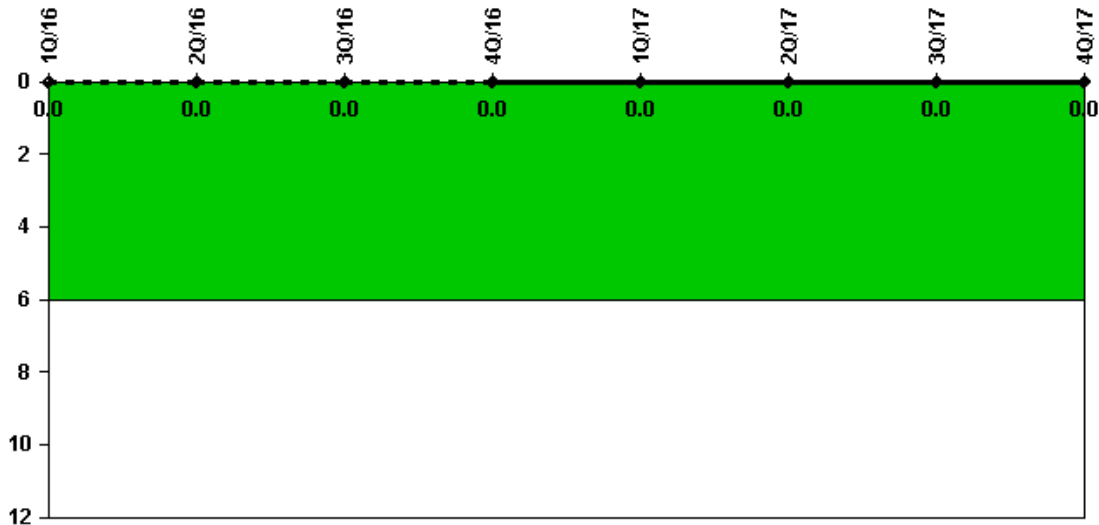
Unplanned Scrams per 7000 Critical Hrs	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Unplanned scrams	0	0	0	0	0	0	0	0
Critical hours	2183.0	2184.0	2208.0	2209.0	2159.0	1556.0	2208.0	2209.0

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

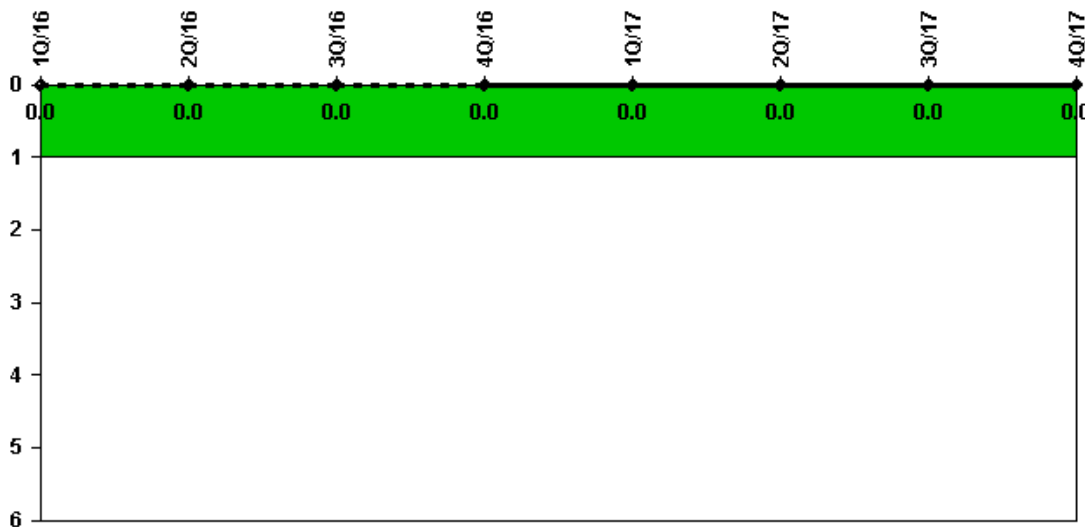
**Notes**

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	0	0	0	0	0	0	0
Critical hours	2183.0	2184.0	2208.0	2209.0	2159.0	1556.0	2208.0	2209.0
<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

**Unplanned Scrams with Complications**



Thresholds: White > 1.0

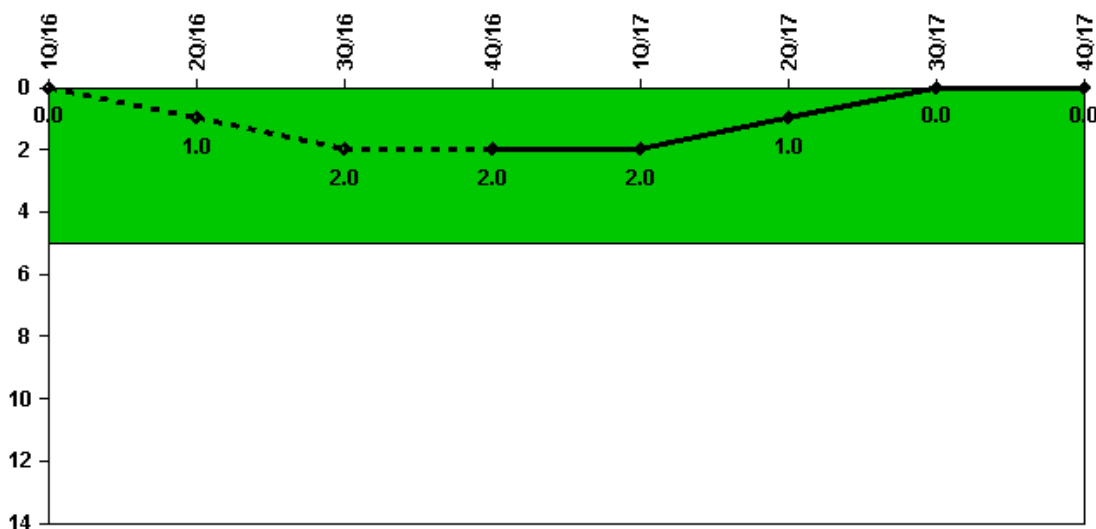
**Notes**

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
<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)** 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17 4Q/17

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

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

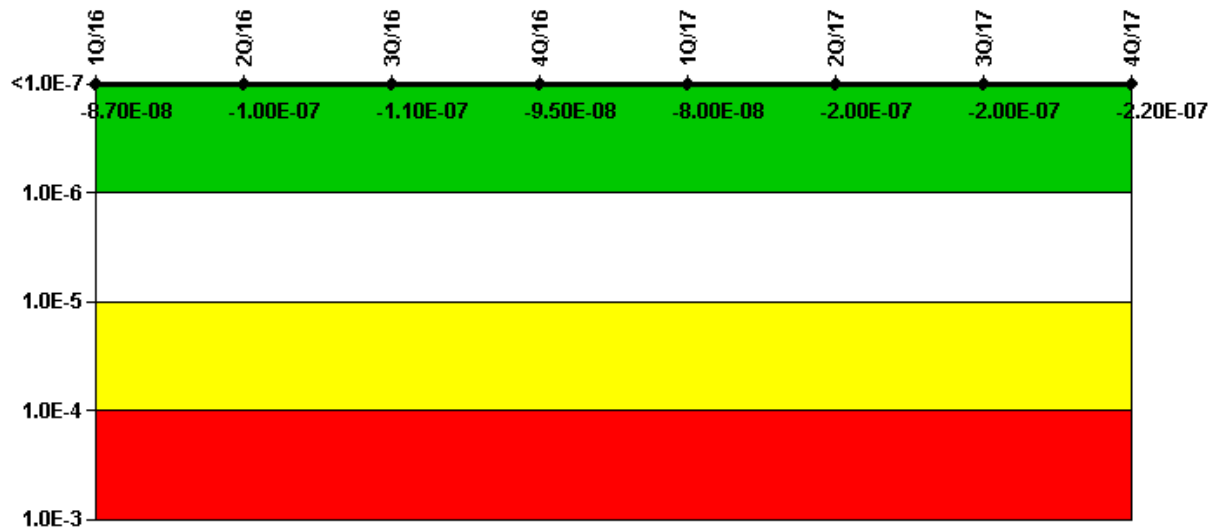
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Licensee Comments:

3Q/16: Licensee Event Report 2016-002-00 - Inadequate Protection from Tornado Missiles Identified Due to Non-Conforming Design Conditions

2Q/16: LER 2016-001-00: Auxiliary Feedwater Diesel Intake Design Deficiency Related to Turbine Building High Energy Line Break Resulted in an Unanalyzed Condition Due to Insufficient Validation of Vendor Analysis Inputs

### 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)	3.58E-08	2.21E-08	8.75E-09	2.49E-08	4.06E-08	4.42E-08	4.42E-08	2.01E-08
URI (ΔCDF)	-1.23E-07	-1.23E-07	-1.22E-07	-1.20E-07	-1.21E-07	-2.41E-07	-2.42E-07	-2.38E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-8.70E-08	-1.00E-07	-1.10E-07	-9.50E-08	-8.00E-08	-2.00E-07	-2.00E-07	-2.20E-07

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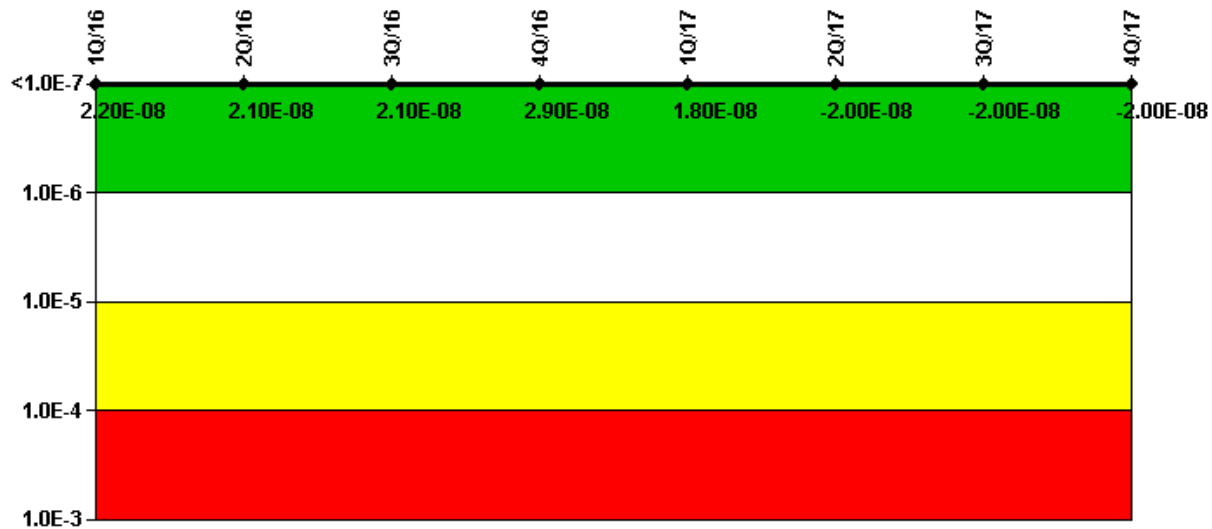
Licensee Comments:

2Q/17: Braidwood PRA Model Revision BB016a, approved March 31, 2017, revised Unit 1 and Unit 2 PRA inputs as part of the periodic data update process.

2Q/16: Changed PRA Parameter(s).

1Q/16: Changed PRA Parameter(s). 4/15/16: Braidwood ASM PRA Model Revision No. BB011b4 approved September 30, 2015, revised Byron Unit 1 and Braidwood Unit 2 PRA inputs for installation of Westinghouse Generation 3 RCP safe shutdown seal installation. These seals were installed in 4Q15 at Braidwood.

### 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)	-1.79E-08	-1.84E-08	-1.86E-08	-1.07E-08	-2.18E-08	-1.42E-08	-1.42E-08	-1.42E-08
URI (ΔCDF)	3.96E-08	3.96E-08	3.96E-08	3.96E-08	3.96E-08	-5.98E-09	-6.01E-09	-6.14E-09
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>2.20E-08</b>	<b>2.10E-08</b>	<b>2.10E-08</b>	<b>2.90E-08</b>	<b>1.80E-08</b>	<b>-2.00E-08</b>	<b>-2.00E-08</b>	<b>-2.00E-08</b>

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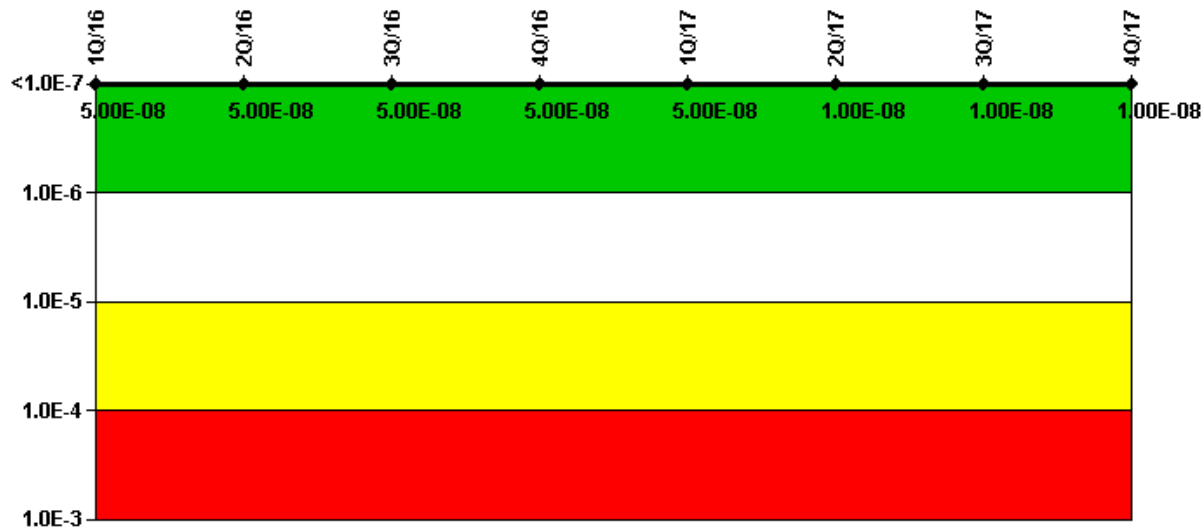
Licensee Comments:

2Q/17: Braidwood PRA Model Revision BB016a, approved March 31, 2017, revised Unit 1 and Unit 2 PRA inputs as part of the periodic data update process.

2Q/16: Changed PRA Parameter(s).

1Q/16: Changed PRA Parameter(s). 4/15/16: Braidwood ASM PRA Model Revision No. BB011b4 approved September 30, 2015, revised Byron Unit 1 and Braidwood Unit 2 PRA inputs for installation of Westinghouse Generation 3 RCP safe shutdown seal installation. These seals were installed in 4Q15 at Braidwood.

### 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 ( $\Delta$ CDF)	2.25E-08	2.21E-08	2.16E-08	2.16E-08	2.16E-08	-3.40E-08	-3.40E-08	-3.40E-08
URI ( $\Delta$ CDF)	2.76E-08	2.78E-08	2.81E-08	2.84E-08	2.89E-08	4.39E-08	4.40E-08	4.42E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>5.00E-08</b>	<b>5.00E-08</b>	<b>5.00E-08</b>	<b>5.00E-08</b>	<b>5.00E-08</b>	<b>1.00E-08</b>	<b>1.00E-08</b>	<b>1.00E-08</b>

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Licensee Comments:

2Q/17: Braidwood PRA Model Revision BB016a, approved March 31, 2017, revised Unit 1 and Unit 2 PRA inputs as part of the periodic data update process.

1Q/17: Risk Cap Invoked.

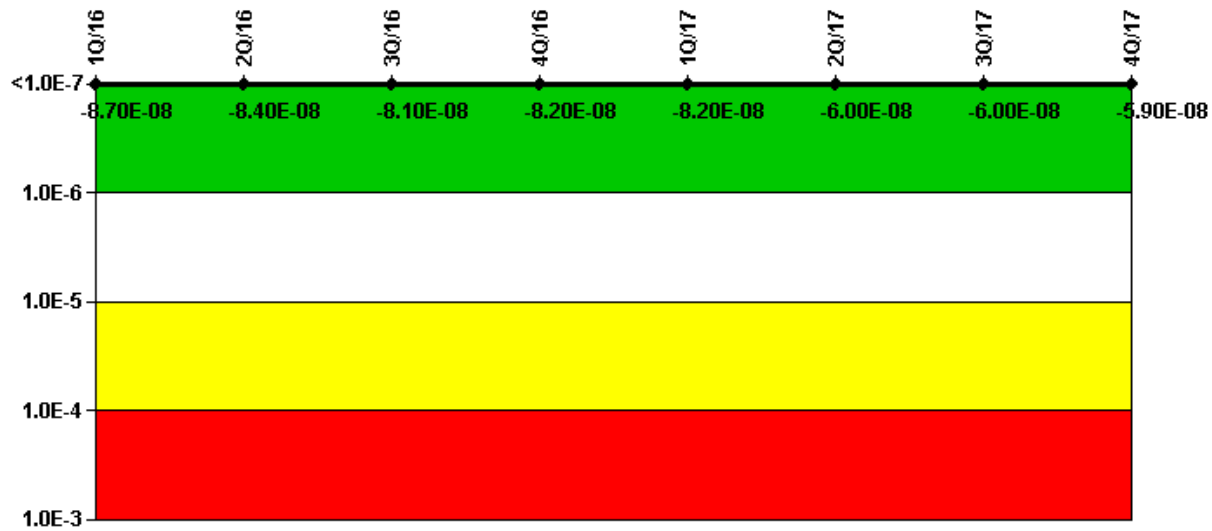
4Q/16: Risk Cap Invoked.

3Q/16: Risk Cap Invoked.

2Q/16: Risk Cap Invoked. Changed PRA Parameter(s).

1Q/16: Risk Cap Invoked. Changed PRA Parameter(s). 4/15/16: Braidwood ASM PRA Model Revision No. BB011b4 approved September 30, 2015, revised Byron Unit 1 and Braidwood Unit 2 PRA inputs for installation of Westinghouse Generation 3 RCP safe shutdown seal installation. These seals were installed in 4Q15 at Braidwood.

### 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)	-2.32E-08	-2.32E-08	-2.32E-08	-2.32E-08	-2.32E-08	-1.59E-08	-1.59E-08	-1.52E-08
URI (ΔCDF)	-6.40E-08	-6.08E-08	-5.81E-08	-5.84E-08	-5.88E-08	-4.37E-08	-4.38E-08	-4.39E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-8.70E-08</b>	<b>-8.40E-08</b>	<b>-8.10E-08</b>	<b>-8.20E-08</b>	<b>-8.20E-08</b>	<b>-6.00E-08</b>	<b>-6.00E-08</b>	<b>-5.90E-08</b>

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Licensee Comments:

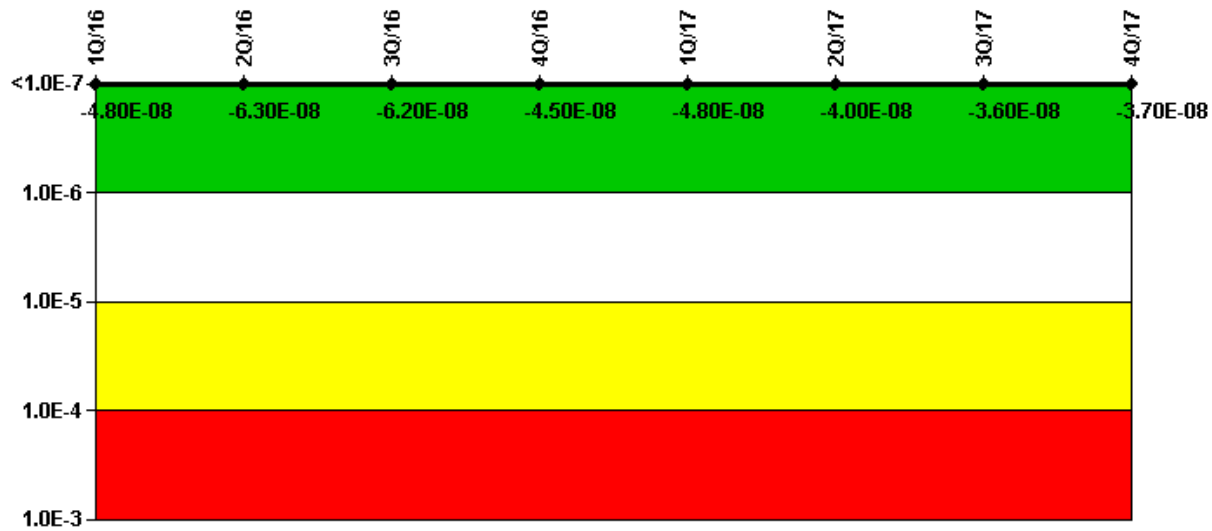
2Q/17: Braidwood PRA Model Revision BB016a, approved March 31, 2017, revised Unit 1 and Unit 2 PRA inputs as part of the periodic data update process.

2Q/16: Changed PRA Parameter(s).

1Q/16: Changed PRA Parameter(s). 4/15/16: Braidwood ASM PRA Model Revision No. BB011b4 approved September 30, 2015, revised Byron Unit 1 and Braidwood Unit 2 PRA inputs for installation of Westinghouse Generation 3 RCP safe shutdown seal installation. These seals were installed in 4Q15 at Braidwood.



### 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)	2.45E-08	1.02E-08	9.39E-09	2.70E-08	2.48E-08	6.31E-08	6.64E-08	6.50E-08
URI (ΔCDF)	-7.21E-08	-7.27E-08	-7.14E-08	-7.19E-08	-7.29E-08	-1.03E-07	-1.02E-07	-1.02E-07
PLE	NO	NO	NO	NO	NO	NO	NO	NO
<b>Indicator value</b>	<b>-4.80E-08</b>	<b>-6.30E-08</b>	<b>-6.20E-08</b>	<b>-4.50E-08</b>	<b>-4.80E-08</b>	<b>-4.00E-08</b>	<b>-3.60E-08</b>	<b>-3.70E-08</b>

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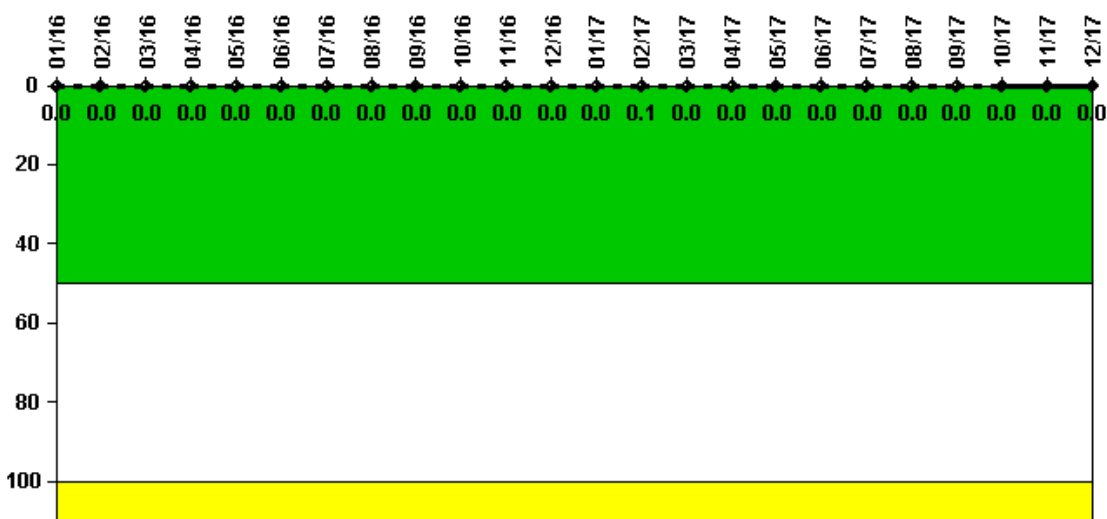
Licensee Comments:

2Q/17: Braidwood PRA Model Revision BB016a, approved March 31, 2017, revised Unit 1 and Unit 2 PRA inputs as part of the periodic data update process.

2Q/16: Changed PRA Parameter(s).

1Q/16: Changed PRA Parameter(s). 4/15/16: Braidwood ASM PRA Model Revision No. BB011b4 approved September 30, 2015, revised Byron Unit 1 and Braidwood Unit 2 PRA inputs for installation of Westinghouse Generation 3 RCP safe shutdown seal installation. These seals were installed in 4Q15 at Braidwood.

### Reactor Coolant System Activity



Thresholds: White > 50.0 Yellow > 100.0

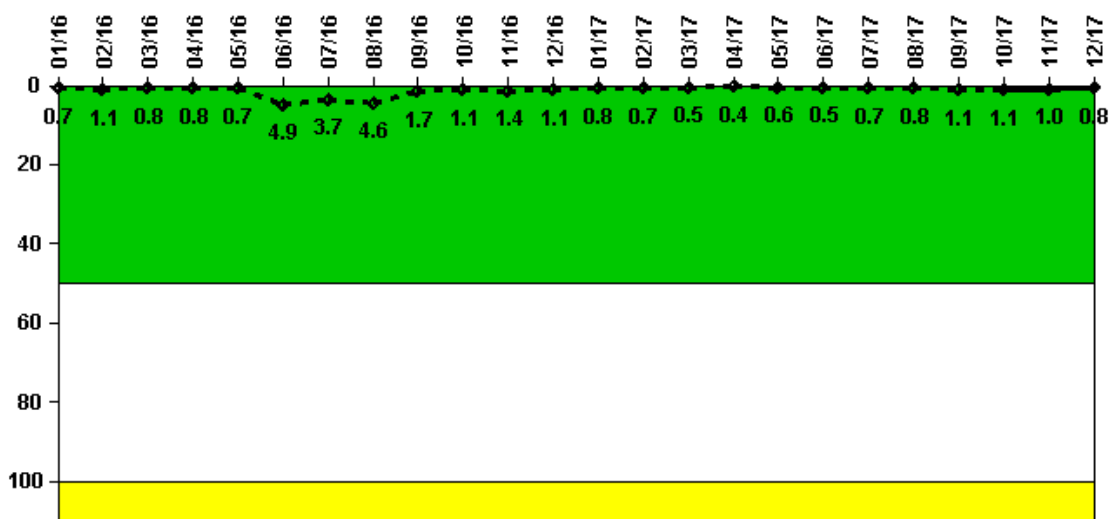
#### Notes

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	0.000151	0.000137	0.000196	0.000162	0.000173	0.000152	0.000168	0.000174	0.000190	0.000211	0.000209	0.000215
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	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	0.000230	0.000854	0.000334	0.000227	0.000074	0.000115	0.000114	0.000118	0.000140	0.000127	0.000170	0.000171
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	0.1	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	0.073	0.112	0.078	0.078	0.067	0.486	0.374	0.460	0.174	0.114	0.144	0.105
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

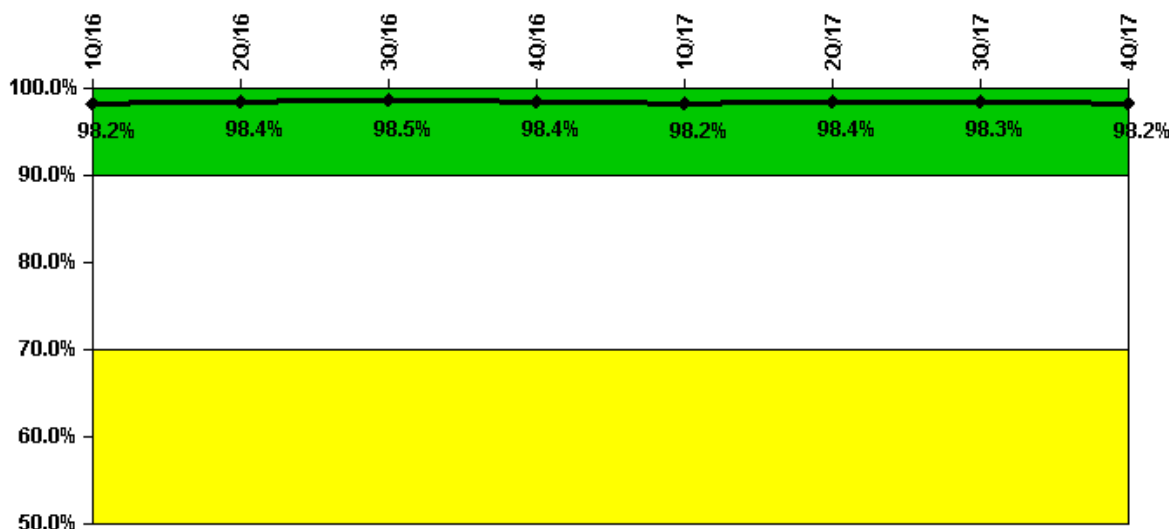
<b>Indicator value</b>	<b>0.7</b>	<b>1.1</b>	<b>0.8</b>	<b>0.8</b>	<b>0.7</b>	<b>4.9</b>	<b>3.7</b>	<b>4.6</b>	<b>1.7</b>	<b>1.1</b>	<b>1.4</b>	<b>1.1</b>
Reactor Coolant System Leakage	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17	10/17	11/17	12/17
Maximum leakage	0.080	0.066	0.048	0.044	0.057	0.051	0.067	0.083	0.113	0.108	0.101	0.080
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>0.8</b>	<b>0.7</b>	<b>0.5</b>	<b>0.4</b>	<b>0.6</b>	<b>0.5</b>	<b>0.7</b>	<b>0.8</b>	<b>1.1</b>	<b>1.1</b>	<b>1.0</b>	<b>0.8</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	63.0	63.0	46.0	46.0	20.0	88.0	22.0
Total opportunities	35.0	64.0	66.0	46.0	47.0	20.0	89.0	22.0

**Indicator value**                    **98.2% 98.4% 98.5% 98.4% 98.2% 98.4% 98.3% 98.2%**

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#### Licensee Comments:

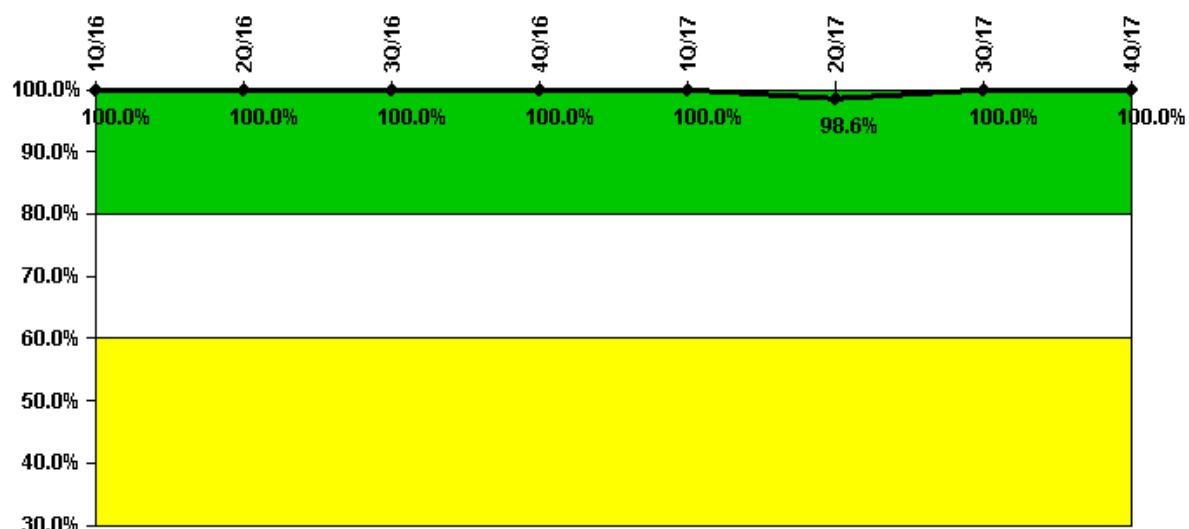
2Q/17: 8/29/17 - A review identified two additional successful DEP opportunities due to a newly qualified Shift Manager. For April 2017, data changed from 4 to 6 successful opportunities and from 4 to 6 total opportunities.

1Q/17: 7/6/17 - A review identified two additional successful DEP opportunities for March 2017. Data changed from 22 to 24 successful opportunities and from 23 to 25 total opportunities. 8/29/17 - A review identified a reduction of two successful DEP opportunities for March 2017 due to qualification timing of a new Shift Manager. Data changes from 24 to 22 successful opportunities and from 25 to 23 successful opportunities.

1Q/17: 7/6/17 - A review identified two additional successful DEP opportunities for March 2017. Data changed from 22 to 24 successful opportunities and from 23 to 25 total opportunities.

2Q/16: 8/29/17 - A review identified four additional successful DEP opportunities for May 2016. Data changed from 17 to 21 successful opportunities and from 18 to 22 total opportunities.

### 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	67.0	66.0	64.0	66.0	71.0	69.0	68.0	74.0
Total Key personnel	67.0	66.0	64.0	66.0	71.0	70.0	68.0	74.0

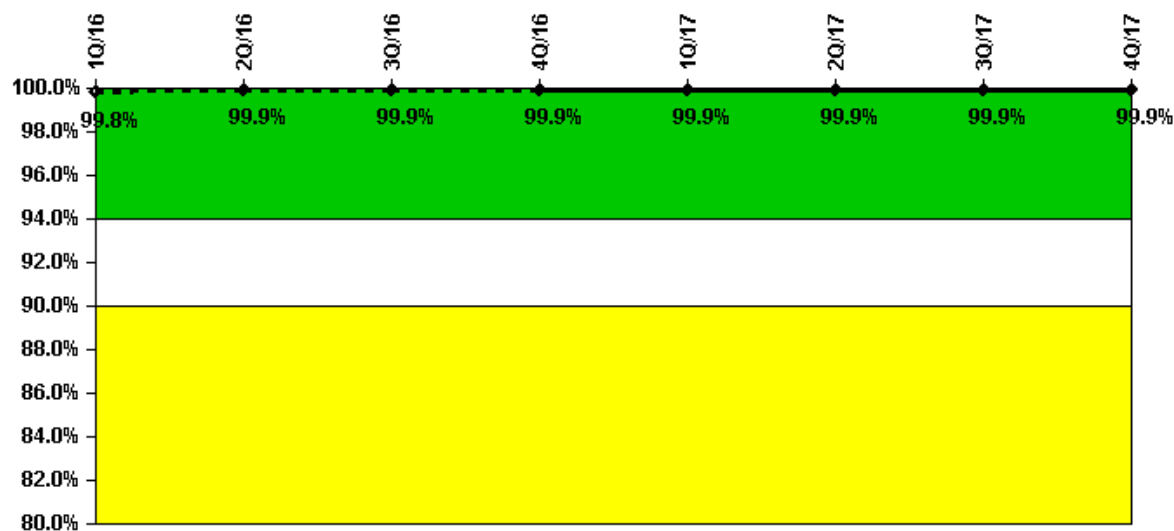
**Indicator value**                    **100.0% 100.0% 100.0% 100.0% 100.0% 98.6% 100.0% 100.0%**

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#### Licensee Comments:

2Q/17: 8/29/17 - A review identified one newly qualified Shift Manager was not accounted for, which increased the Key Personnel by two - one for shift emergency director and one for shift communicator. For April and May 2017, data changed from 70 to 72 for participating key personnel and from 70 to 72 for total key personnel. For June 2017, data changed from 67 to 69 for participating key personnel and from 68 to 70 for total key personnel.

### Alert & Notification System



Thresholds: White < 94.0% Yellow < 90.0%

#### Notes

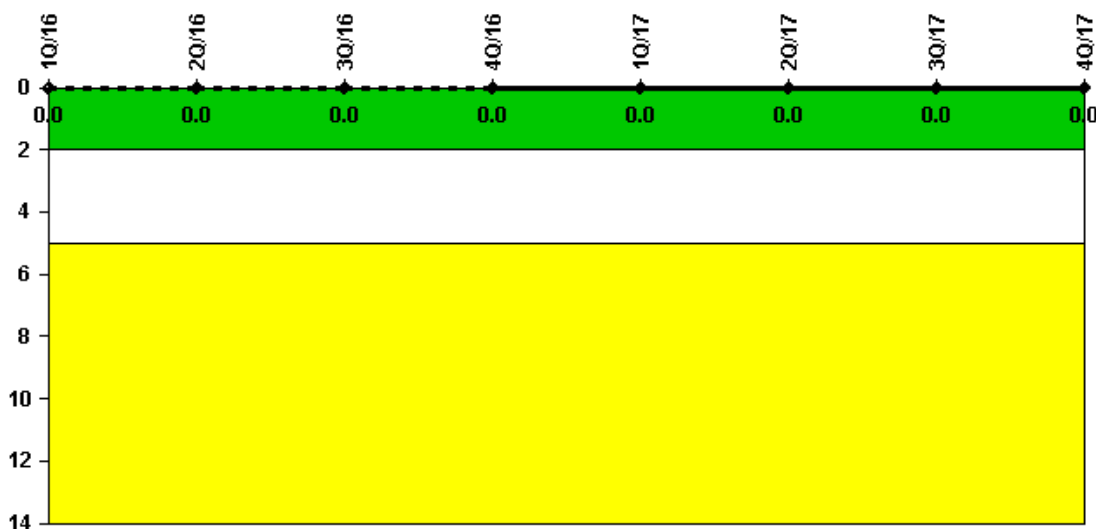
Alert & Notification System	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Successful siren-tests	3070	3071	3064	2976	3116	3067	3018	3024
Total sirens-tests	3072	3072	3072	2976	3120	3072	3024	3024

**Indicator value**                    **99.8%** **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**

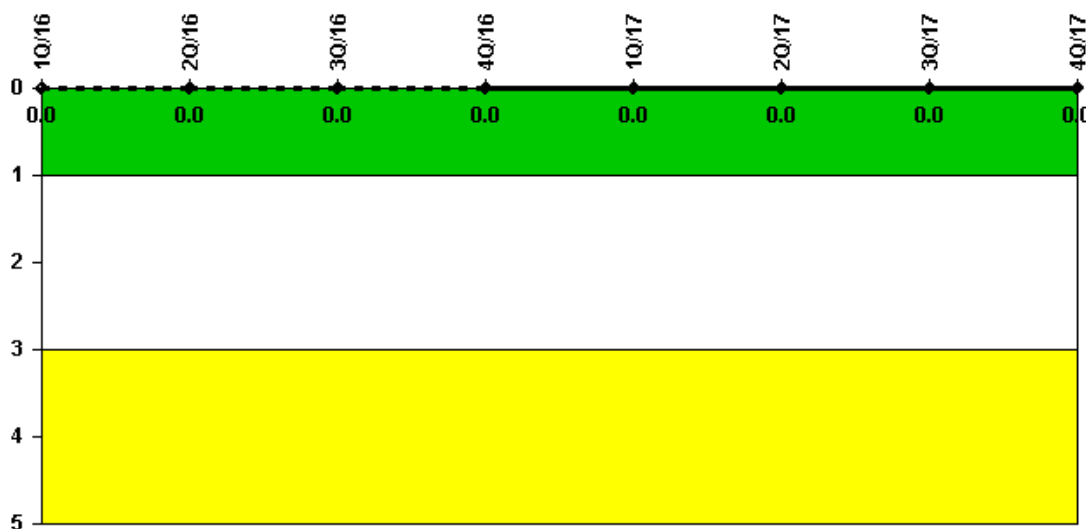
**Occupational Exposure Control Effectiveness** 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17 4Q/17

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