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## Palo Verde 2 – Quarterly Performance Indicators

### 2Q/2017 Performance Indicators

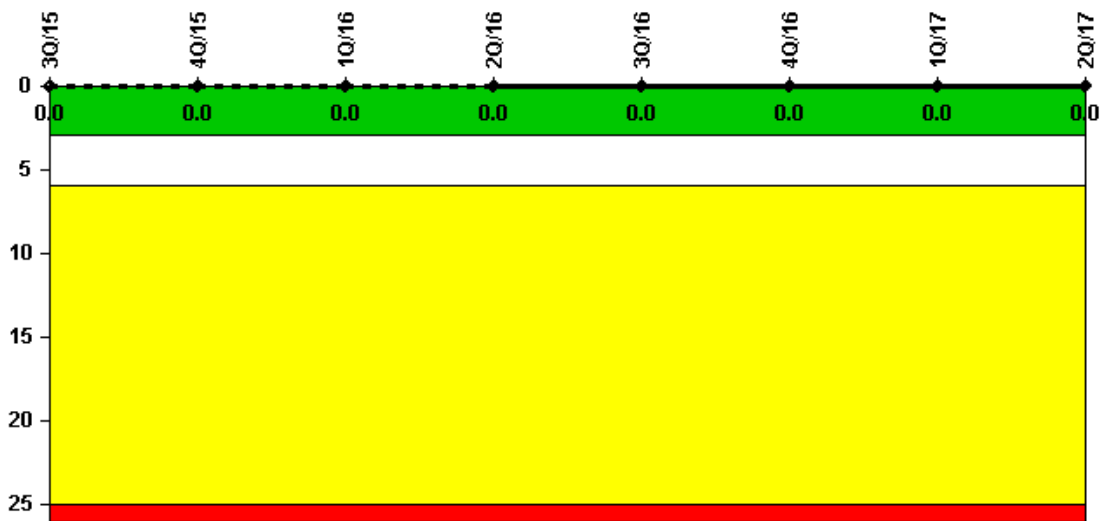
The solid trend line represents the current reporting period.

Licensee's General Comments: none

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### Unplanned Scrams per 7000 Critical Hrs



Thresholds: White > 3.0 Yellow > 6.0 Red > 25.0

#### Notes

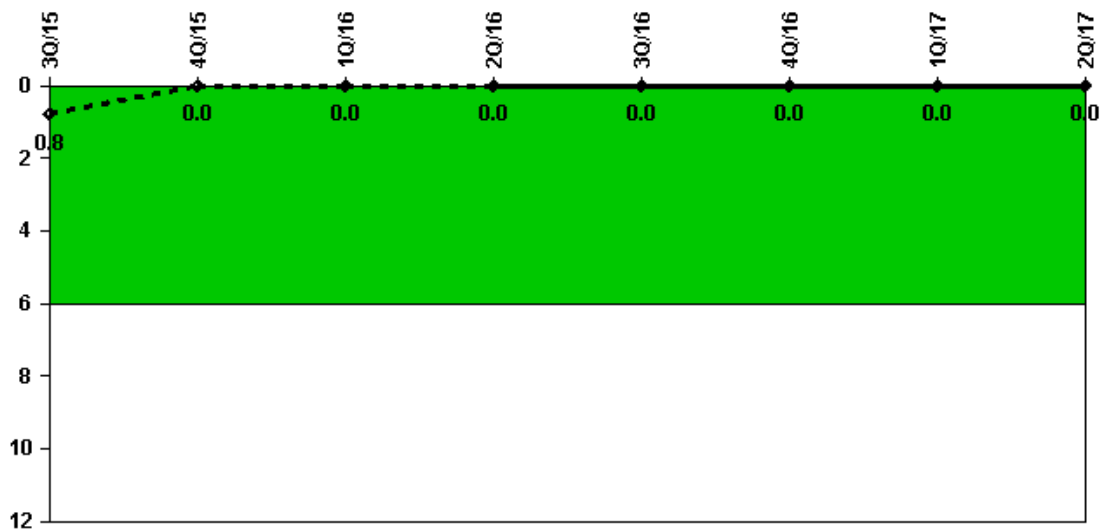
| Unplanned Scrams per 7000 Critical Hrs | 3Q/15  | 4Q/15  | 1Q/16  | 2Q/16  | 3Q/16  | 4Q/16  | 1Q/17  | 2Q/17  |
|--|--------|--------|--------|--------|--------|--------|--------|--------|
| Unplanned scrams                       | 0      | 0      | 0      | 0      | 0      | 0      | 0      | 0      |
| Critical hours                         | 2208.0 | 1363.6 | 2184.0 | 2184.0 | 2208.0 | 2208.0 | 2160.0 | 1463.2 |

| 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**

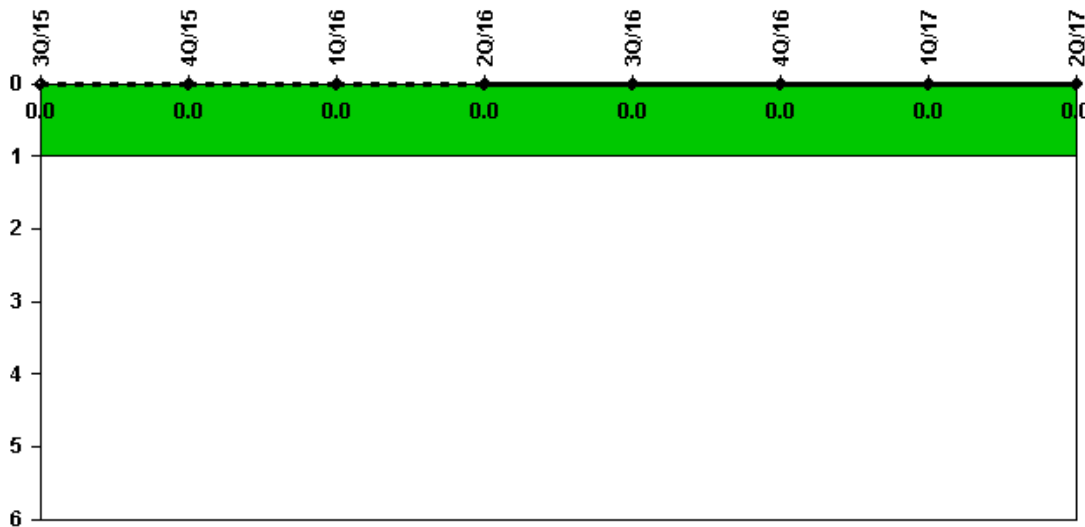
| Unplanned Power Changes per 7000 Critical Hrs | 3Q/15      | 4Q/15    | 1Q/16    | 2Q/16    | 3Q/16    | 4Q/16    | 1Q/17    | 2Q/17    |
|---|------------|----------|----------|----------|----------|----------|----------|----------|
| Unplanned power changes                       | 0          | 0        | 0        | 0        | 0        | 0        | 0        | 0        |
| Critical hours                                | 2208.0     | 1363.6   | 2184.0   | 2184.0   | 2208.0   | 2208.0   | 2160.0   | 1463.2   |
| <b>Indicator value</b>                        | <b>0.8</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:

3Q/15: On September 25, 2015, Unit 2 was granted an exigent amendment to Technical Specification Surveillance Requirement 3.1.5.3 to eliminate further quarterly performance for control element assemble #88 for the remainder of the 19th Unit 2 operating cycle. Reference ADAMS Accession # ML 15266A005.

**Unplanned Scrams with Complications**



Thresholds: White > 1.0

**Notes**

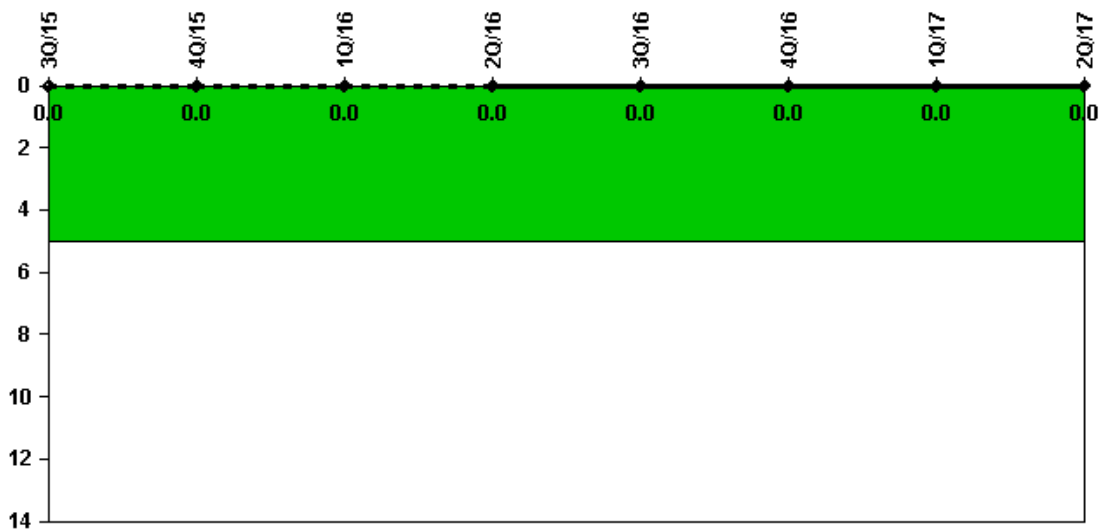
| Unplanned Scrams with Complications | 3Q/15 | 4Q/15 | 1Q/16 | 2Q/16 | 3Q/16 | 4Q/16 | 1Q/17 | 2Q/17 |
|-------------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Scrams with complications           | 0     | 0     | 0     | 0     | 0     | 0     | 0   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

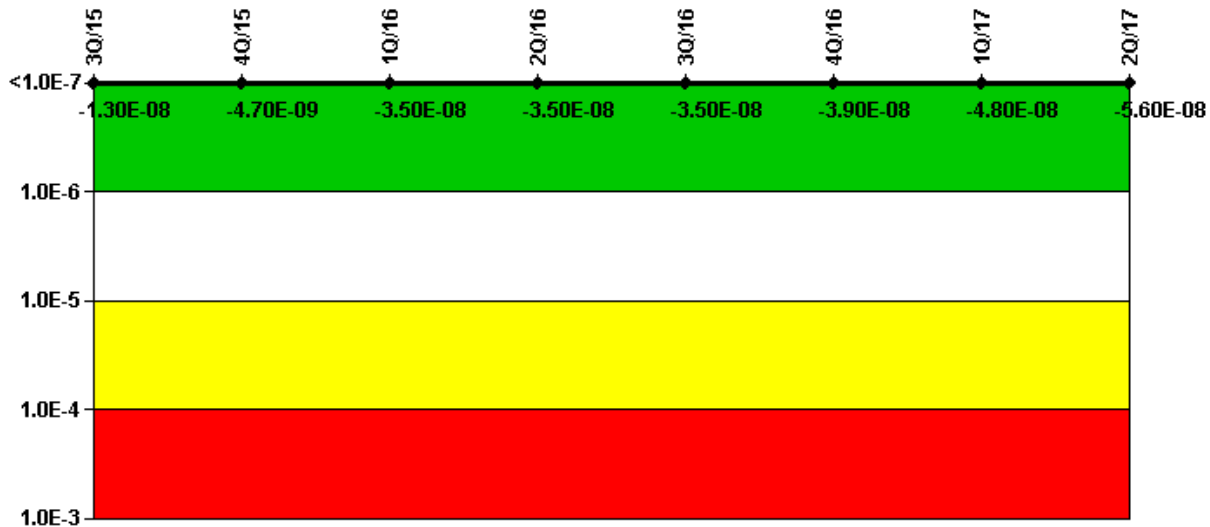
Safety System Functional Failures 0 0 0 0 0 0 0 0

Indicator value 0 0 0 0 0 0 0 0

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Licensee Comments: none

### 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**

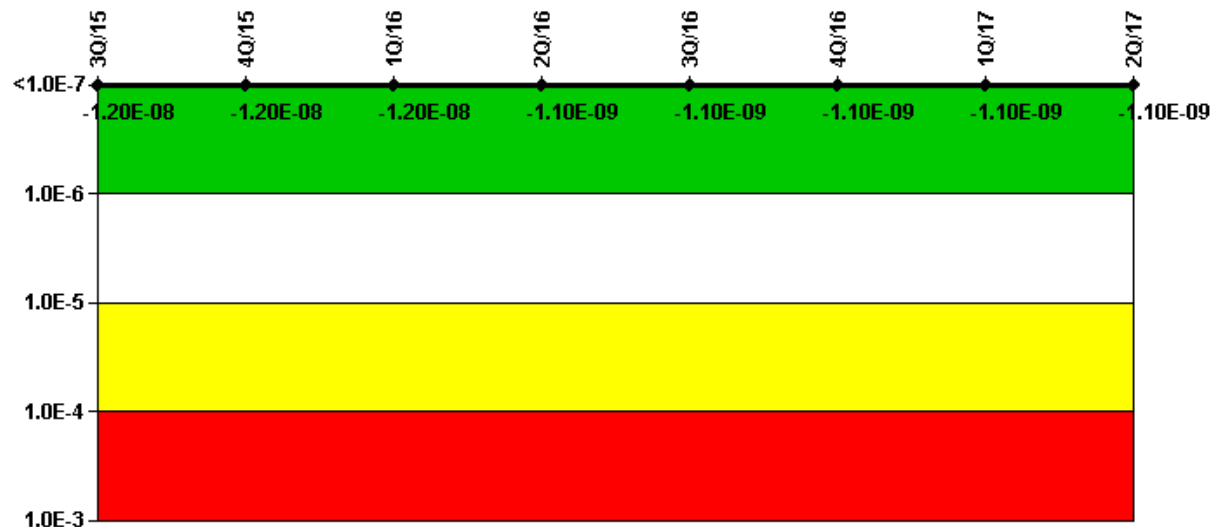
|                        | 3Q/15            | 4Q/15            | 1Q/16            | 2Q/16            | 3Q/16            | 4Q/16            | 1Q/17            | 2Q/17            |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| UAI (ΔCDF)             | -1.65E-10        | 8.25E-09         | 1.59E-08         | 1.59E-08         | 1.57E-08         | 1.22E-08         | 3.09E-09         | -5.02E-09        |
| URI (ΔCDF)             | -1.29E-08        | -1.29E-08        | -5.09E-08        | -5.09E-08        | -5.09E-08        | -5.09E-08        | -5.09E-08        | -5.09E-08        |
| PLE                    | NO               | NO               | NO               | NO               | NO               | NO               | NO               | NO               |
| <b>Indicator value</b> | <b>-1.30E-08</b> | <b>-4.70E-09</b> | <b>-3.50E-08</b> | <b>-3.50E-08</b> | <b>-3.50E-08</b> | <b>-3.90E-08</b> | <b>-4.80E-08</b> | <b>-5.60E-08</b> |

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Licensee Comments:

1Q/16: In March 2016, fuel oil head tank support bracket bolts (2) on the 2A emergency diesel generator were discovered to be laying beneath the brackets. The preliminary determination is the engine would have provided its key safety function for its PRA mission time and the discovered condition does not constitute a MSPI failure. Further engineering analysis is in progress to make a final determination.  
 3Q/15: In 3rd Quarter 2015, updated unavailability for EDG 2A for September 2012, net change was ( ) 1.91 hours and EDG 1B for April 2014 and February 2015, net change was (-) 25.72 hours , no color change as a result.

**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**

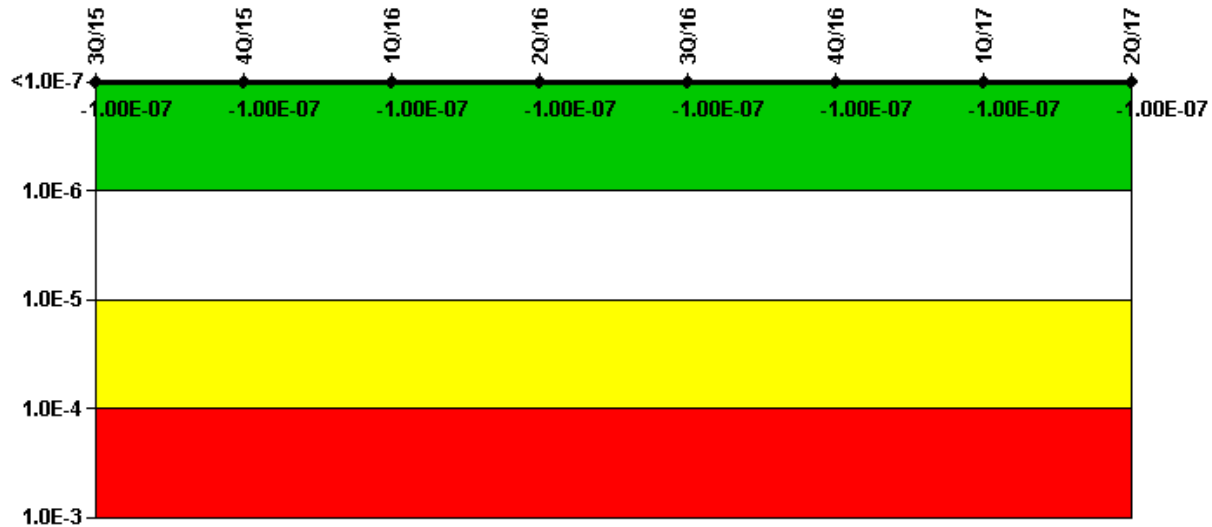
|            | 3Q/15     | 4Q/15     | 1Q/16     | 2Q/16     | 3Q/16     | 4Q/16     | 1Q/17     | 2Q/17     |
|------------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|-----------|
| UAI (ΔCDF) | -1.52E-09 | -1.52E-09 | -1.52E-09 | -1.52E-09 | -1.52E-09 | -1.52E-09 | -1.52E-09 | -1.52E-09 |
| URI (ΔCDF) | -1.03E-08 | -1.03E-08 | -1.03E-08 | 3.87E-10  | 3.87E-10  | 3.87E-10  | 3.87E-10  | 3.87E-10  |
| PLE        | NO        | NO        | NO        | NO        | NO        | NO        | NO        | NO        |

Indicator value -1.20E-08   -1.20E-08   -1.20E-08   -1.10E-09   -1.10E-09   -1.10E-09   -1.10E-09   -1.10E-09

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Licensee Comments: none

### Mitigating Systems Performance Index, Heat Removal System



Thresholds: White >  $1.00E-6$  Yellow >  $1.00E-5$  Red >  $1.00E-4$

#### Notes

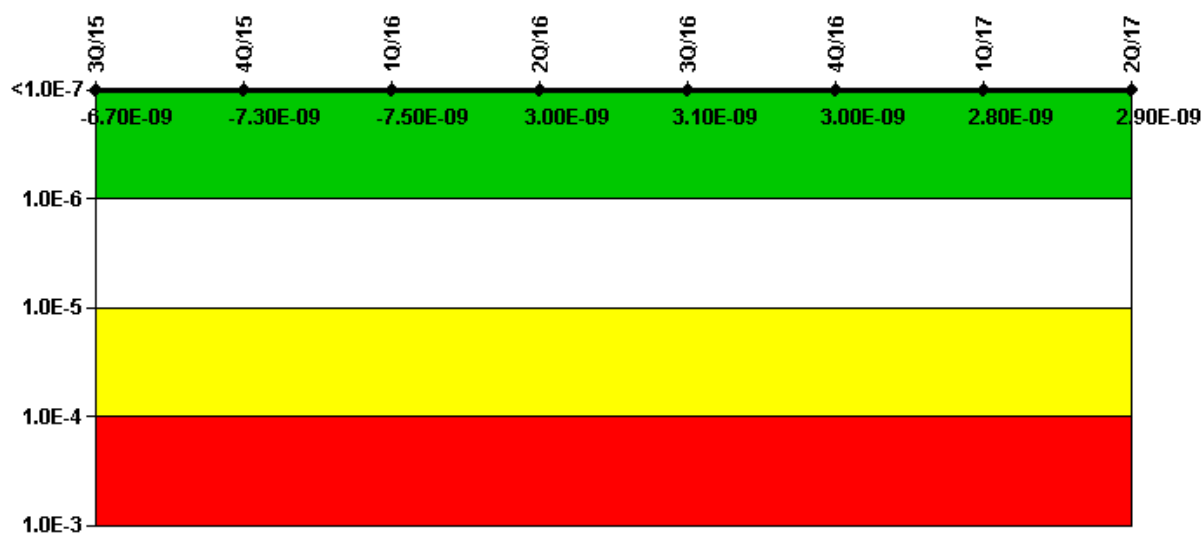
#### Mitigating Systems Performance Index, Heat Removal System

|                     | 3Q/15       | 4Q/15       | 1Q/16       | 2Q/16       | 3Q/16       | 4Q/16       | 1Q/17       | 2Q/17       |
|---------------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|-------------|
| UAI ( $\Delta$ CDF) | $-4.84E-08$ | $-4.84E-08$ | $-4.84E-08$ | $-4.84E-08$ | $-4.84E-08$ | $-4.84E-08$ | $-4.84E-08$ | $-4.84E-08$ |
| URI ( $\Delta$ CDF) | $-5.15E-08$ | $-5.15E-08$ | $-5.15E-08$ | $-5.15E-08$ | $-5.15E-08$ | $-5.15E-08$ | $-5.15E-08$ | $-5.15E-08$ |
| PLE                 | NO          | NO          | NO          | NO          | NO          | NO          | NO          | NO          |
| Indicator value     | $-1.00E-07$ | $-1.00E-07$ | $-1.00E-07$ | $-1.00E-07$ | $-1.00E-07$ | $-1.00E-07$ | $-1.00E-07$ | $-1.00E-07$ |

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Licensee Comments: none

### Mitigating Systems Performance Index, Residual Heat Removal System



Thresholds: White > 1.00E-6 Yellow > 1.00E-5 Red > 1.00E-4

#### Notes

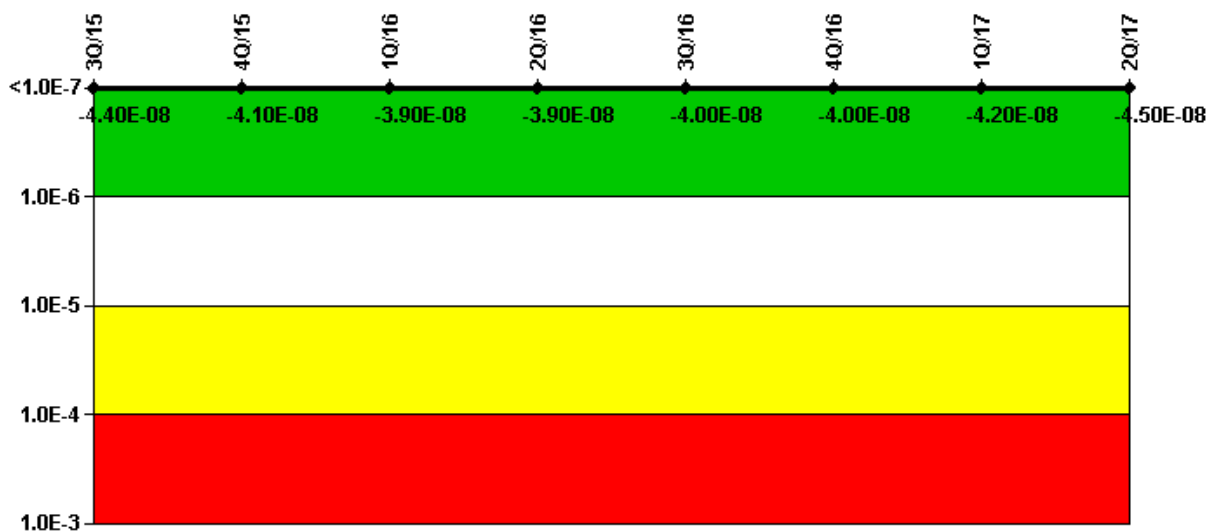
#### Mitigating Systems Performance Index, Residual Heat Removal System

|                        | 3Q/15            | 4Q/15            | 1Q/16            | 2Q/16           | 3Q/16           | 4Q/16           | 1Q/17           | 2Q/17           |
|------------------------|------------------|------------------|------------------|-----------------|-----------------|-----------------|-----------------|-----------------|
| UAI ( $\Delta$ CDF)    | -2.94E-10        | -9.14E-10        | -1.10E-09        | -1.26E-09       | -1.20E-09       | -1.26E-09       | -1.46E-09       | -1.40E-09       |
| URI ( $\Delta$ CDF)    | -6.37E-09        | -6.37E-09        | -6.37E-09        | 4.26E-09        | 4.26E-09        | 4.26E-09        | 4.26E-09        | 4.26E-09        |
| PLE                    | NO               | NO               | NO               | NO              | NO              | NO              | NO              | NO              |
| <b>Indicator value</b> | <b>-6.70E-09</b> | <b>-7.30E-09</b> | <b>-7.50E-09</b> | <b>3.00E-09</b> | <b>3.10E-09</b> | <b>3.00E-09</b> | <b>2.80E-09</b> | <b>2.90E-09</b> |

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Licensee Comments: none

### 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**

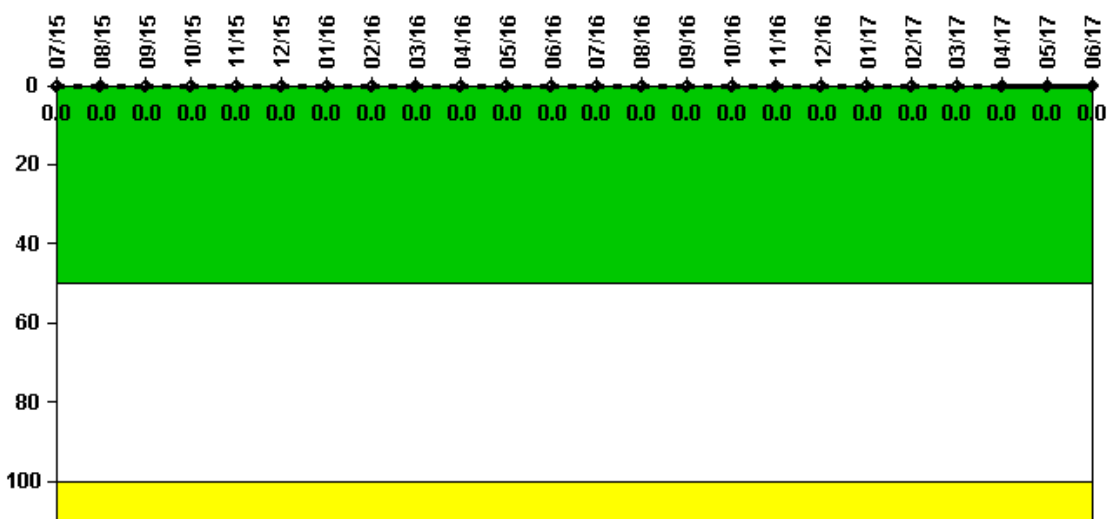
|                        | 3Q/15            | 4Q/15            | 1Q/16            | 2Q/16            | 3Q/16            | 4Q/16            | 1Q/17            | 2Q/17            |
|------------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|------------------|
| UAI (ΔCDF)             | 1.24E-09         | 4.62E-09         | 6.36E-09         | 6.29E-09         | 6.12E-09         | 5.68E-09         | 3.66E-09         | 4.38E-10         |
| URI (ΔCDF)             | -4.57E-08        | -4.57E-08        | -4.57E-08        | -4.57E-08        | -4.57E-08        | -4.57E-08        | -4.57E-08        | -4.57E-08        |
| PLE                    | NO               | NO               | NO               | NO               | NO               | NO               | NO               | NO               |
| <b>Indicator value</b> | <b>-4.40E-08</b> | <b>-4.10E-08</b> | <b>-3.90E-08</b> | <b>-3.90E-08</b> | <b>-4.00E-08</b> | <b>-4.00E-08</b> | <b>-4.20E-08</b> | <b>-4.50E-08</b> |

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Licensee Comments: none



### Reactor Coolant System Activity



Thresholds: White > 50.0 Yellow > 100.0

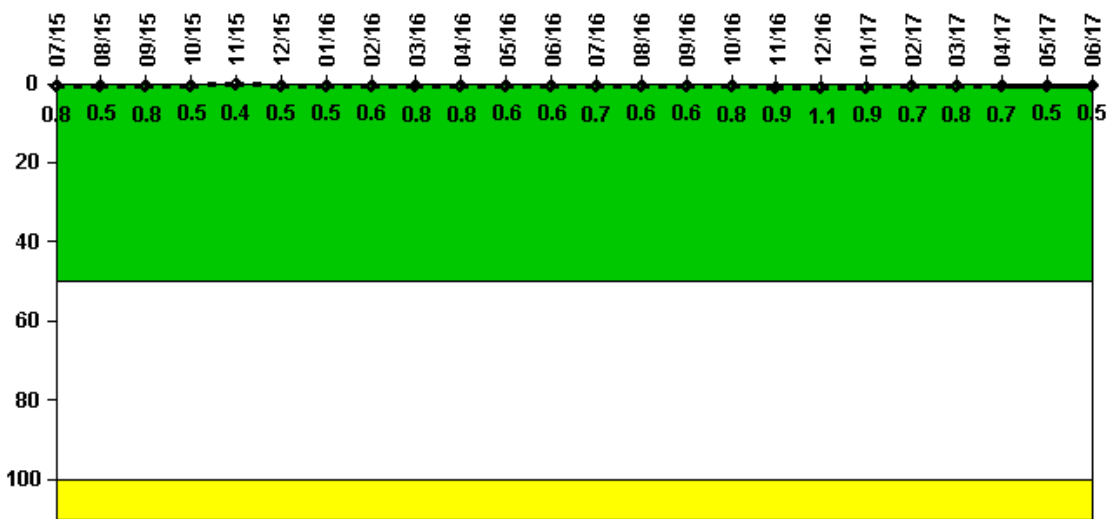
**Notes**

| Reactor Coolant System Activity | 7/15     | 8/15     | 9/15     | 10/15    | 11/15    | 12/15    | 1/16     | 2/16     | 3/16     | 4/16     | 5/16     | 6/16     |
|---------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|----------|
| Maximum activity                | 0.000194 | 0.000190 | 0.000226 | 0.000221 | 0.000198 | 0.000259 | 0.000160 | 0.000162 | 0.000166 | 0.000166 | 0.000172 | 0.000179 |
| 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      |
| <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> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> |
| Reactor Coolant System Activity | 7/16     | 8/16     | 9/16     | 10/16    | 11/16    | 12/16    | 1/17     | 2/17     | 3/17     | 4/17     | 5/17     | 6/17     |
| Maximum activity                | 0.000177 | 0.000182 | 0.000186 | 0.000194 | 0.000200 | 0.000196 | 0.000197 | 0.000207 | 0.000204 | 0.000206 | 0.000154 | 0.000153 |
| 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      |
| <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> | <b>0</b> | <b>0</b> | <b>0</b> | <b>0</b> |

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Licensee Comments: none

### Reactor Coolant System Leakage



Thresholds: White > 50.0 Yellow > 100.0

**Notes**

| Reactor Coolant System Leakage | 7/15  | 8/15  | 9/15  | 10/15 | 11/15 | 12/15 | 1/16  | 2/16  | 3/16  | 4/16  | 5/16  | 6/16  |
|--------------------------------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|
| Maximum leakage                | 0.077 | 0.052 | 0.079 | 0.047 | 0.039 | 0.047 | 0.054 | 0.059 | 0.083 | 0.080 | 0.064 | 0.061 |
| 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  |

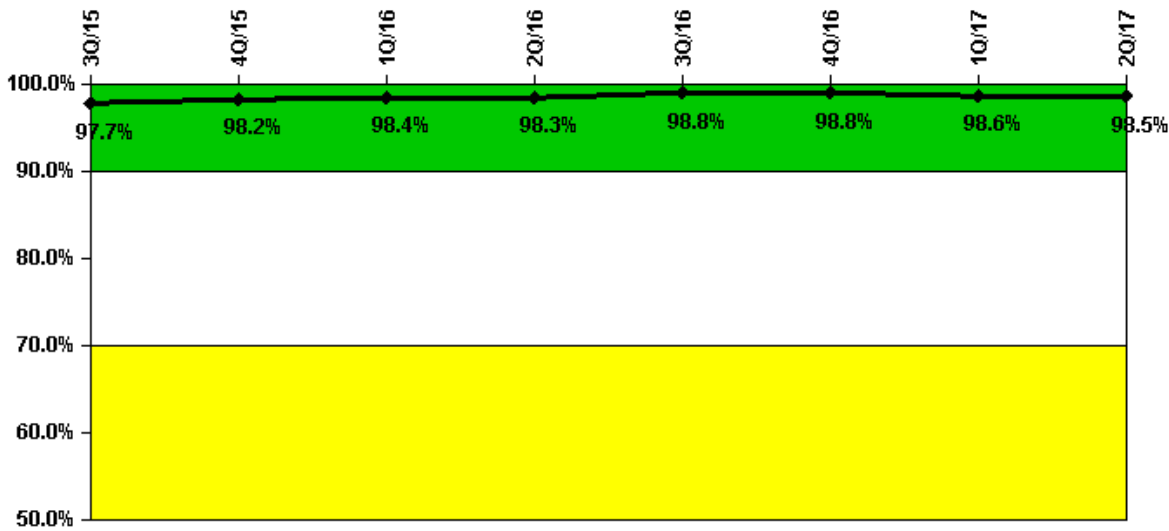
| <b>Indicator value</b>         | <b>0.8</b> | <b>0.5</b> | <b>0.8</b> | <b>0.5</b> | <b>0.4</b> | <b>0.5</b> | <b>0.5</b> | <b>0.6</b> | <b>0.8</b> | <b>0.8</b> | <b>0.6</b> | <b>0.6</b> |
|--------------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|
| Reactor Coolant System Leakage | 7/16       | 8/16       | 9/16       | 10/16      | 11/16      | 12/16      | 1/17       | 2/17       | 3/17       | 4/17       | 5/17       | 6/17       |
| Maximum leakage                | 0.069      | 0.060      | 0.056      | 0.077      | 0.089      | 0.109      | 0.090      | 0.071      | 0.080      | 0.070      | 0.048      | 0.051      |
| 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>0.6</b> | <b>0.6</b> | <b>0.8</b> | <b>0.9</b> | <b>1.1</b> | <b>0.9</b> | <b>0.7</b> | <b>0.8</b> | <b>0.7</b> | <b>0.5</b> | <b>0.5</b> |
|------------------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|------------|

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Licensee Comments: none

### Drill/Exercise Performance



Thresholds: White < 90.0% Yellow < 70.0%

#### Notes

| Drill/Exercise Performance | 3Q/15 | 4Q/15 | 1Q/16 | 2Q/16 | 3Q/16 | 4Q/16 | 1Q/17 | 2Q/17 |
|----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Successful opportunities   | 50.0  | 163.0 | 203.0 | 3.0   | 46.0  | 51.0  | 80.0  | 4.0   |
| Total opportunities        | 50.0  | 164.0 | 206.0 | 3.0   | 48.0  | 52.0  | 82.0  | 4.0   |

**Indicator value**                    **97.7% 98.2% 98.4% 98.3% 98.8% 98.8% 98.6% 98.5%**

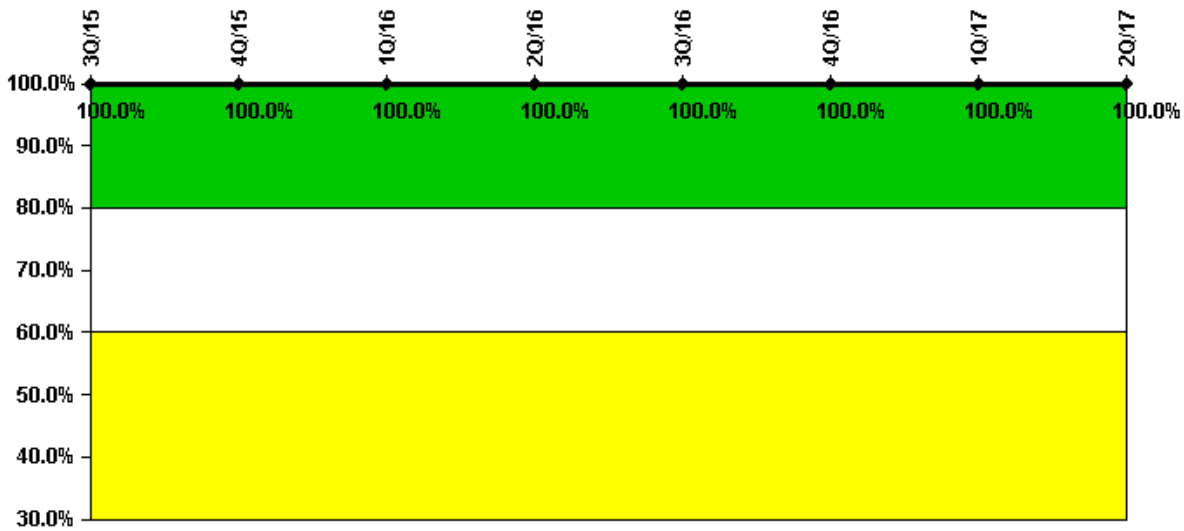
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#### Licensee Comments:

1Q/16: On March 29, 2016, a new shift manager became qualified in two key ERO positions and completed two opportunities and successes which were not included in the previously submitted data. No color change.

4Q/15: The total number of drill / exercise opportunities and successes was revised from 87 to 86 each (no additional failures). No color change resulted.

### ERO Drill Participation



Thresholds: White < 80.0% Yellow < 60.0%

#### Notes

| ERO Drill Participation     | 3Q/15 | 4Q/15 | 1Q/16 | 2Q/16 | 3Q/16 | 4Q/16 | 1Q/17 | 2Q/17 |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Participating Key personnel | 95.0  | 91.0  | 91.0  | 95.0  | 93.0  | 94.0  | 91.0  | 85.0  |
| Total Key personnel         | 95.0  | 91.0  | 91.0  | 95.0  | 93.0  | 94.0  | 91.0  | 85.0  |

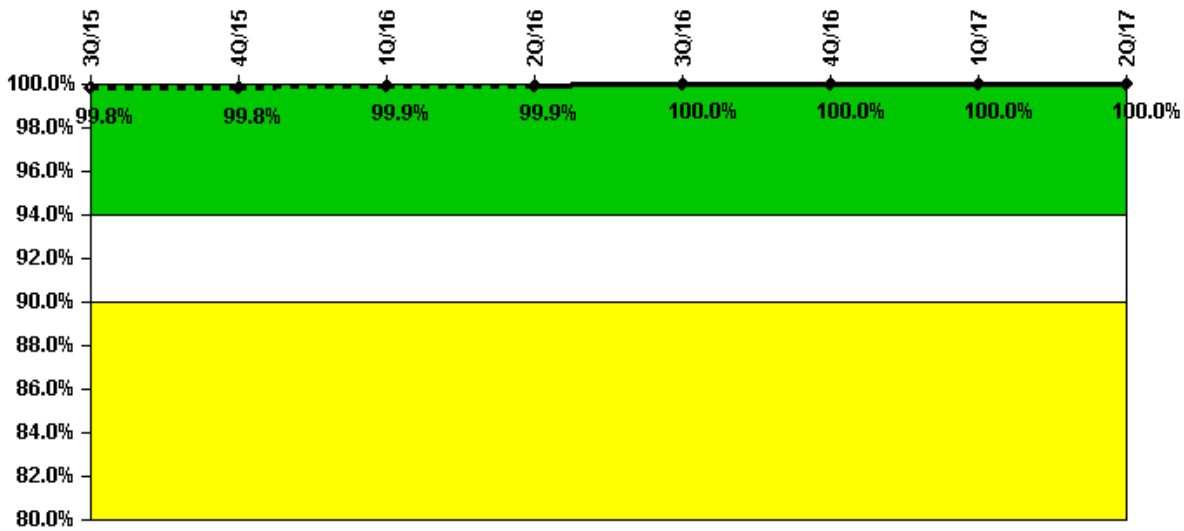
**Indicator value**                    **100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0%**

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#### Licensee Comments:

1Q/16: On March 29, 2016, a new shift manager became qualified in two key ERO positions which were not included in the previously submitted data. No color change.

### Alert & Notification System



Thresholds: White < 94.0% Yellow < 90.0%

#### Notes

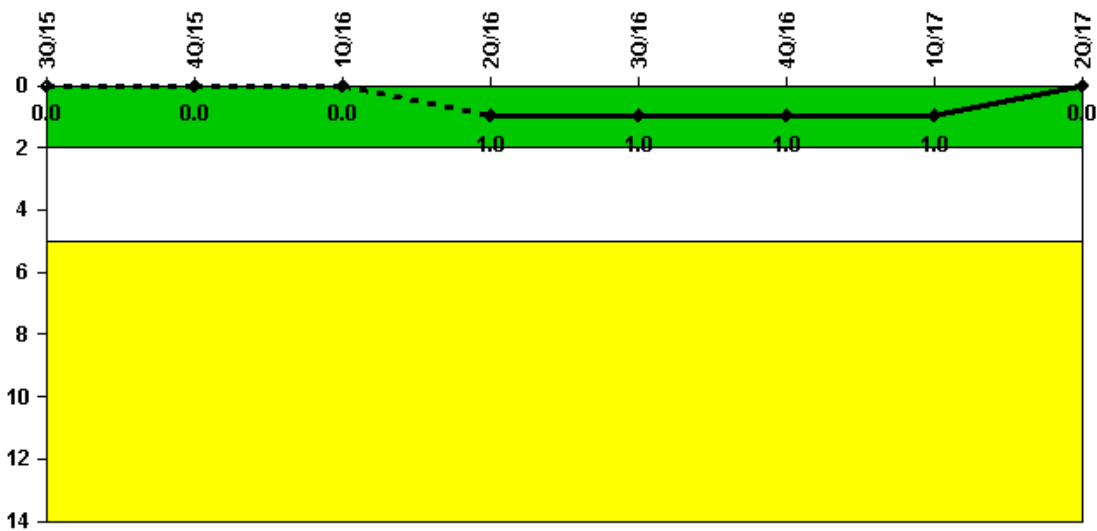
| Alert & Notification System | 3Q/15 | 4Q/15 | 1Q/16 | 2Q/16 | 3Q/16 | 4Q/16 | 1Q/17 | 2Q/17 |
|-----------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
| Successful siren-tests      | 909   | 1008  | 1102  | 1044  | 1102  | 1218  | 1102  | 1102  |
| Total sirens-tests          | 912   | 1008  | 1102  | 1044  | 1102  | 1218  | 1102  | 1102  |

**Indicator value**                    **99.8%** **99.8%** **99.9%** **99.9%** **100.0%** **100.0%** **100.0%** **100.0%**

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Licensee Comments: none

### Occupational Exposure Control Effectiveness



Thresholds: White > 2.0 Yellow > 5.0

#### Notes

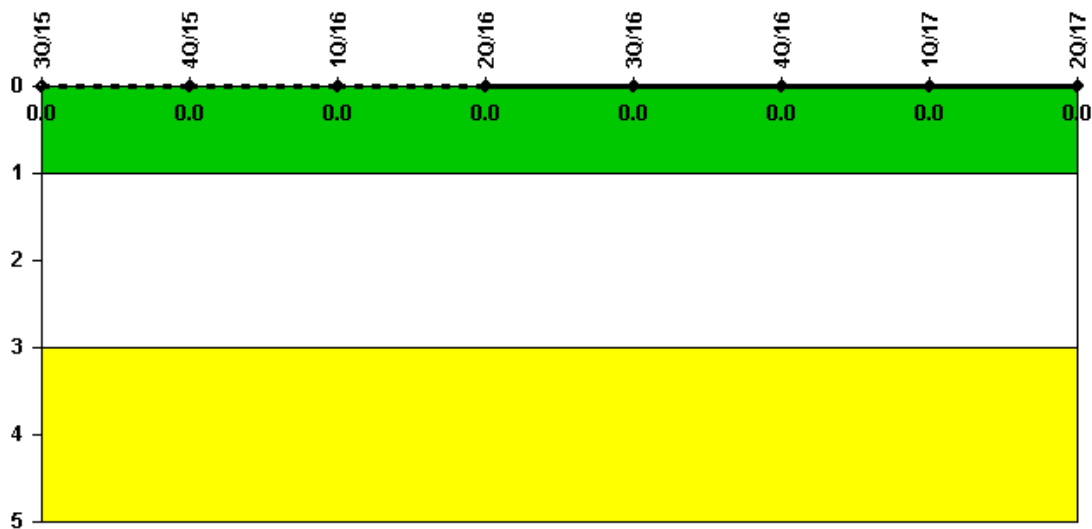
#### Occupational Exposure Control Effectiveness 3Q/15 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17

|                                      |          |          |          |          |          |          |          |          |
|--------------------------------------|----------|----------|----------|----------|----------|----------|----------|----------|
| High radiation area occurrences      | 0        | 0        | 0        | 1        | 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>1</b> | <b>1</b> | <b>1</b> | <b>1</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** 3Q/15 4Q/15 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/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: July 26, 2017*

*Page Last Reviewed/Updated Wednesday, June 07, 2017*