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Palo Verde 1 – Quarterly Performance Indicators

4Q/2017 Performance Indicators

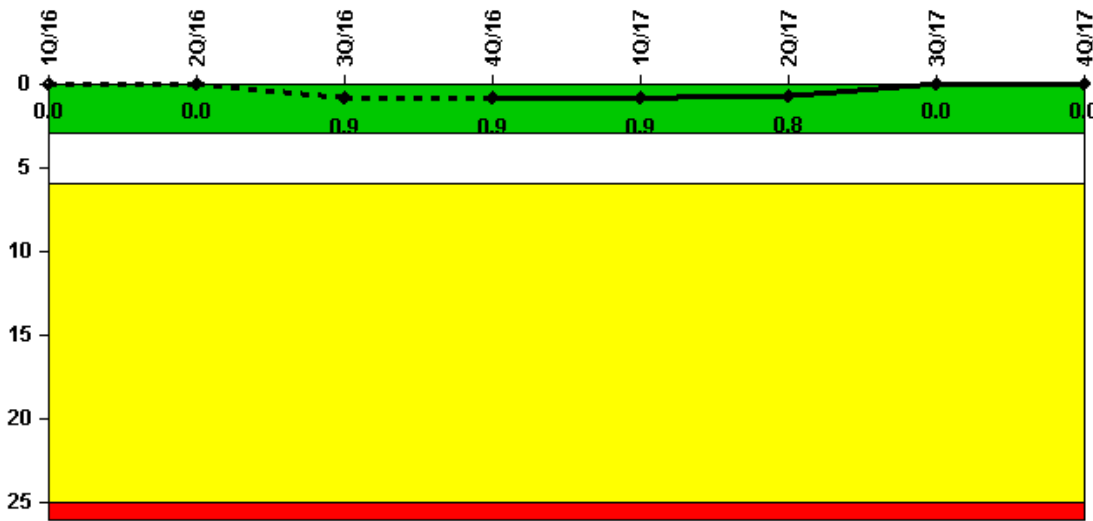
The solid trend line represents the current reporting period.

Licensee's General Comments: none

On this page:

- Unplanned Scrams (IE01)
- Unplanned Power Changes per 7000 Critical Hours (IE03)
- Unplanned Scrams with Complications (IE04)
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- Cooling Water Systems (MS10)
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- Drill/Exercise Performance (EP01)
- Emergency Response Organization Drill Participation (EP02)
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Unplanned Scrams per 7000 Critical Hrs



Thresholds: White > 3.0 Yellow > 6.0 Red > 25.0

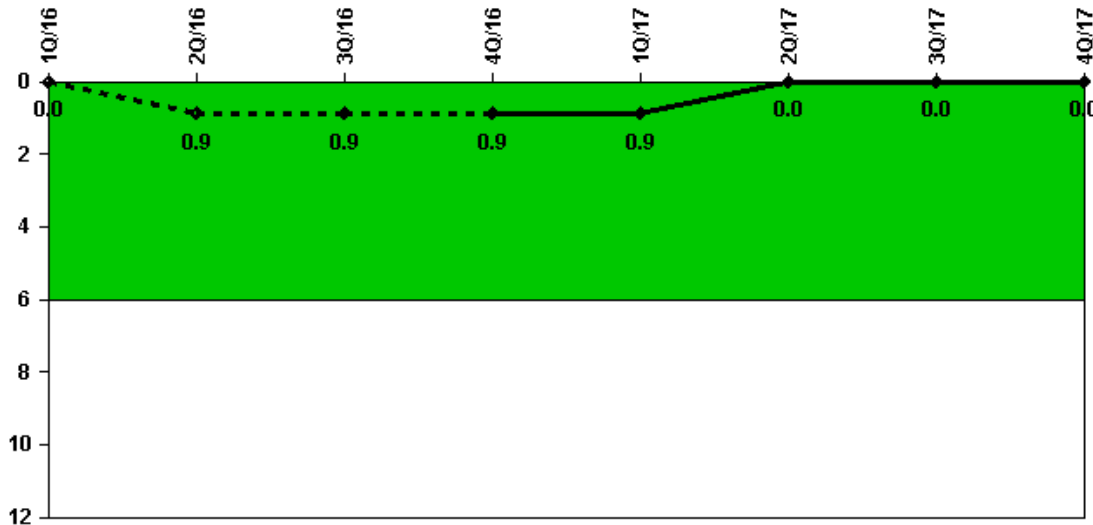
Notes

Unplanned Scrams per 7000 Critical Hrs	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Unplanned scrams	0	0	1.0	0	0	0	0	0
Critical hours	2184.0	1346.9	2099.8	2208.0	2160.0	2184.0	2208.0	1494.9
Indicator value	0	0	0.9	0.9	0.9	0.8	0	0

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Licensee Comments: none

Unplanned Power Changes per 7000 Critical Hrs



Thresholds: White > 6.0

Notes

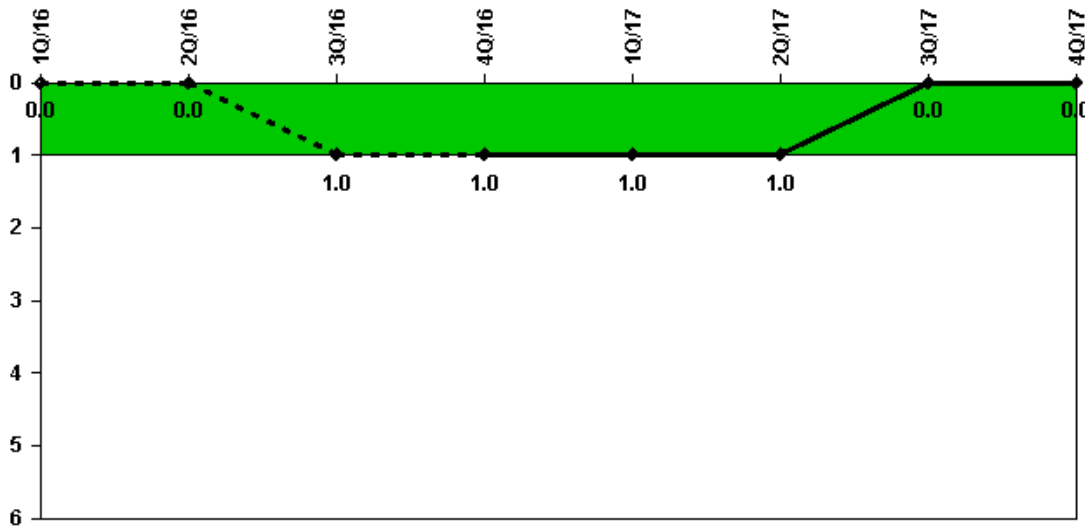
Unplanned Power Changes per 7000 Critical Hrs	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Unplanned power changes	0	1.0	0	0	0	0	0	0
Critical hours	2184.0	1346.9	2099.8	2208.0	2160.0	2184.0	2208.0	1494.9

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

Unplanned Scrams with Complications



Thresholds: White > 1.0

Notes

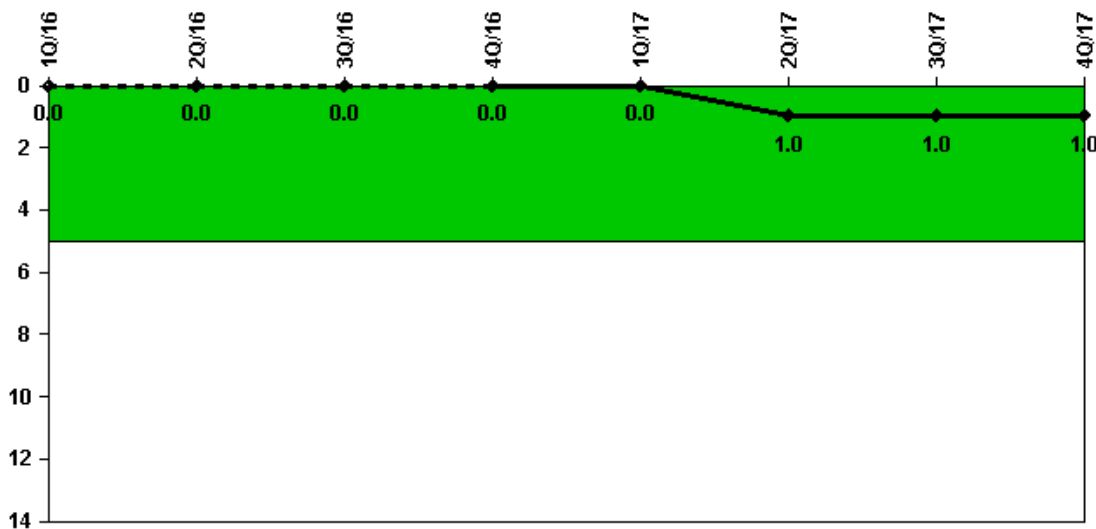
Unplanned Scrams with Complications	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Scrams with complications	0	0	1.0	0	0	0	0	0

Indicator value	0.0	0.0	1.0	1.0	1.0	1.0	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 0 0 0 0 1 0 0

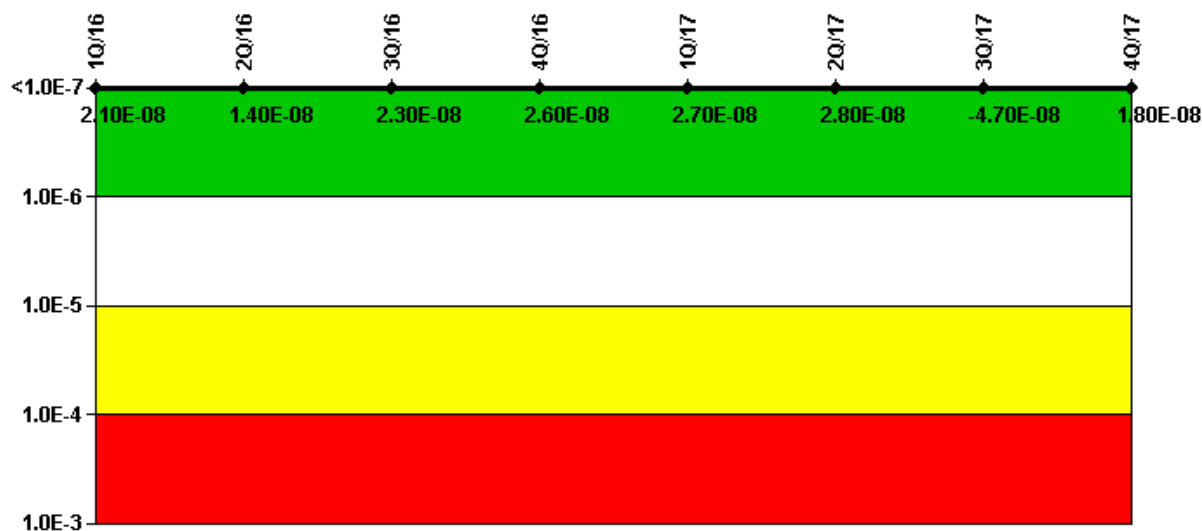
Indicator value 0 0 0 0 0 1 1 1

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Licensee Comments:

2Q/17: LER 2017-001-00 for the Unit 1 train B essential chilled water system chiller failure was reported on June 14, 2017.

Mitigating Systems Performance Index, Emergency AC Power System



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

Notes

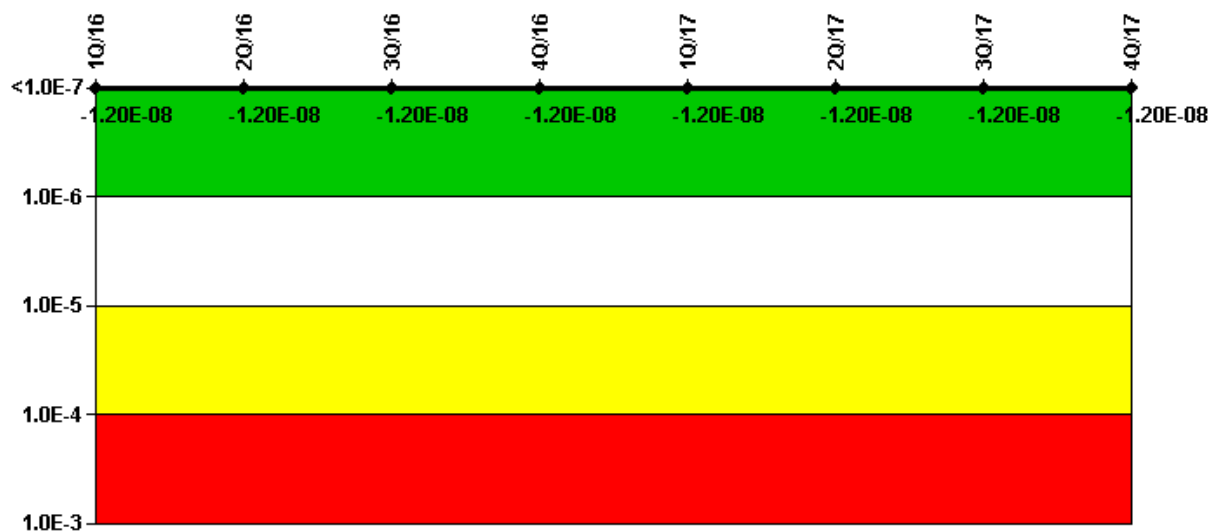
Mitigating Systems Performance Index, Emergency AC Power System

	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (Δ CDF)	5.38E-09	-7.47E-10	8.26E-09	1.07E-08	1.16E-08	1.28E-08	4.25E-09	2.54E-09
URI (Δ CDF)	1.52E-08	1.52E-08	1.52E-08	1.52E-08	1.52E-08	1.52E-08	-5.09E-08	1.52E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	2.10E-08	1.40E-08	2.30E-08	2.60E-08	2.70E-08	2.80E-08	4.70E-08	1.80E-08

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Licensee Comments: none

Mitigating Systems Performance Index, High Pressure Injection System



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

Notes

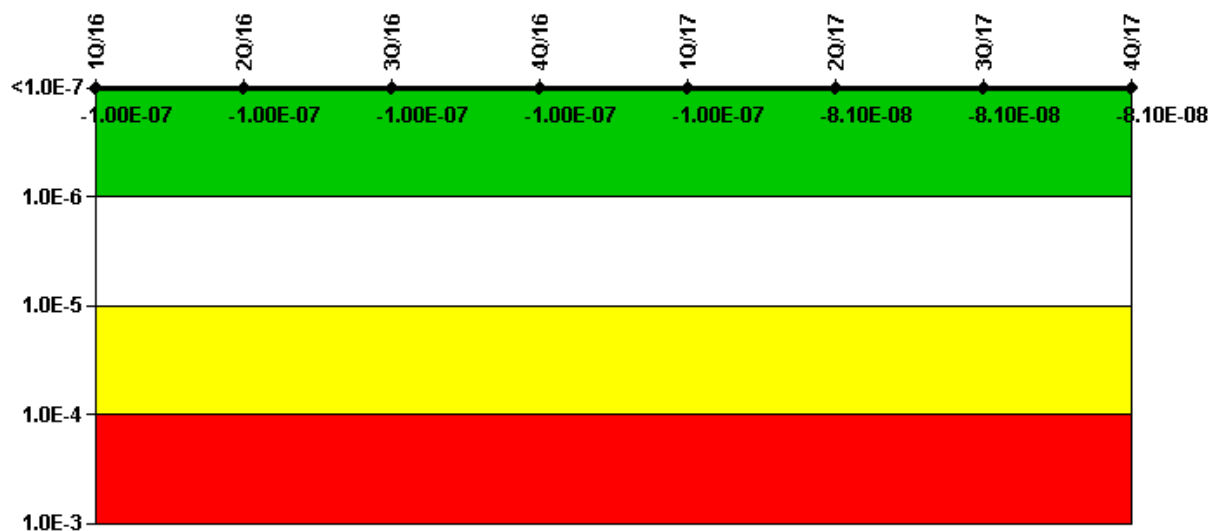
Mitigating Systems Performance Index, High Pressure Injection System

	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (Δ CDF)	-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 (Δ CDF)	-1.03E-08	-1.03E-08	-1.03E-08	-1.03E-08	-1.03E-08	-1.03E-08	-1.03E-08	-1.03E-08
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-1.20E-08	-1.20E-08	-1.20E-08	-1.20E-08	-1.20E-08	-1.20E-08	-1.20E-08	-1.20E-08

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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

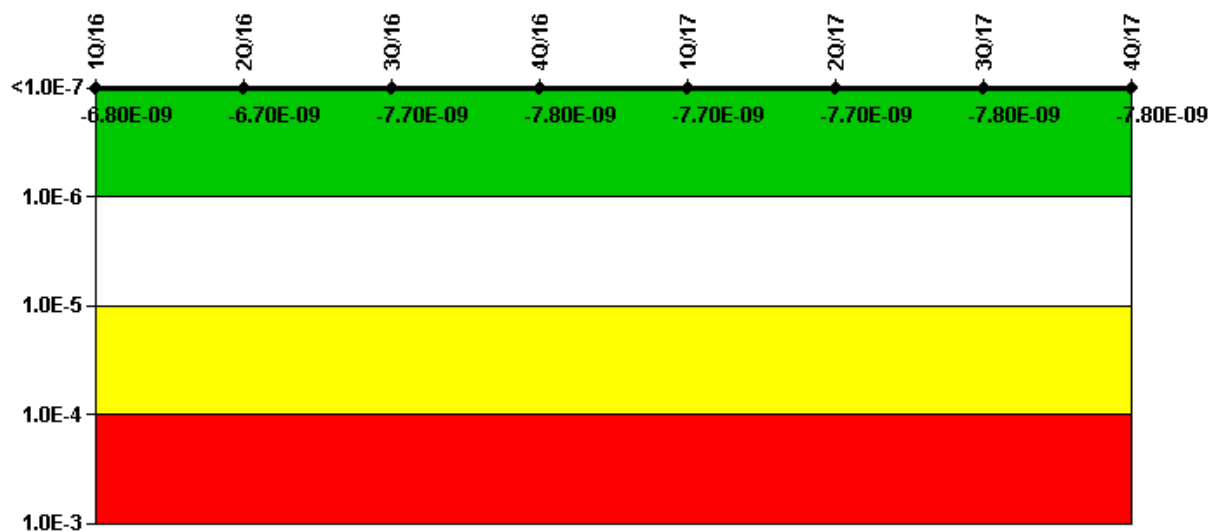
Mitigating Systems Performance Index, Heat Removal System

	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (Δ CDF)	-4.84E-08	-4.84E-08	-4.84E-08	-4.84E-08	-4.84E-08	-2.90E-08	-2.90E-08	-2.90E-08
URI (Δ 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	-8.10E-08	-8.10E-08	-8.10E-08

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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

	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (ΔCDF)	-4.58E-10	-2.81E-10	-1.28E-09	-1.38E-09	-1.29E-09	-1.29E-09	-1.46E-09	-1.46E-09
URI (ΔCDF)	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09	-6.37E-09
PLE	NO	NO	NO	NO	NO	NO	NO	NO
Indicator value	-6.80E-09	-6.70E-09	-7.70E-09	-7.80E-09	-7.70E-09	-7.70E-09	-7.80E-09	-7.80E-09

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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

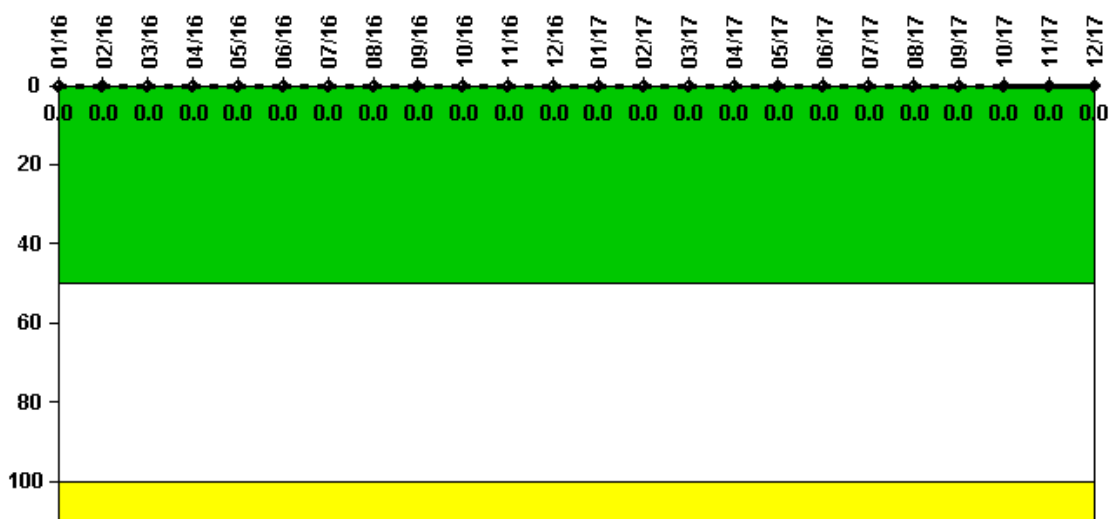
Mitigating Systems Performance Index, Cooling Water Systems

	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
UAI (Δ CDF)	1.06E-08	4.84E-09	8.65E-09	8.53E-09	8.37E-09	6.35E-09	2.69E-09	4.81E-10
URI (Δ CDF)	-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
Indicator value	-3.50E-08	-4.10E-08	-3.70E-08	-3.70E-08	-3.70E-08	-3.90E-08	-4.30E-08	-4.50E-08

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Licensee Comments: none

Reactor Coolant System Activity



Thresholds: White > 50.0 Yellow > 100.0

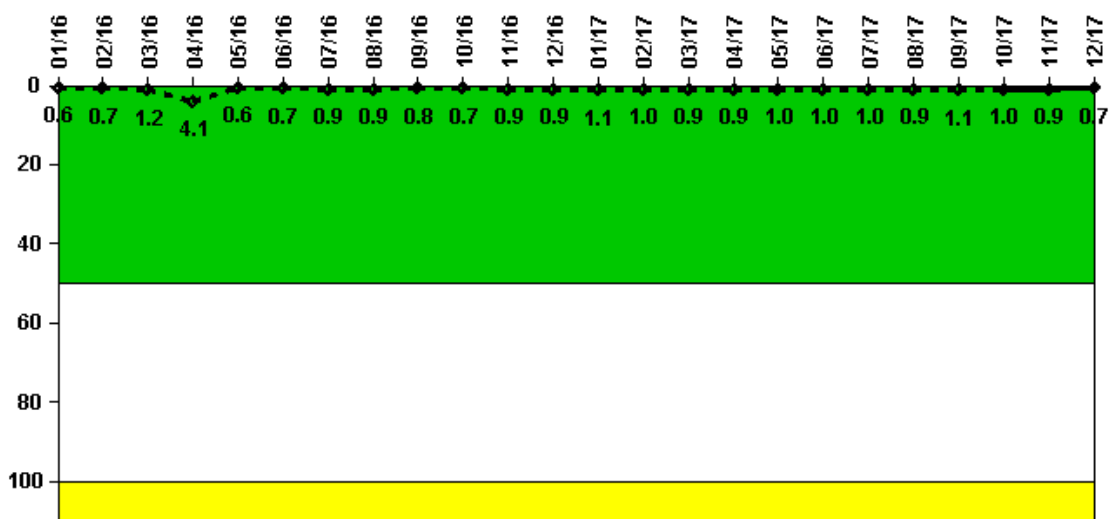
Notes

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	0.000307	0.000286	0.000292	0.000314	0.000178	0.000182	0.000193	0.000306	0.000207	0.000216	0.000223	0.000225
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	0.000217	0.000248	0.000230	0.000269	0.000274	0.000265	0.000287	0.000374	0.000273	0.000291	0.000195	0.000200
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

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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	0.071	0.122	0.411	0.062	0.072	0.085	0.087	0.084	0.065	0.088	0.093
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

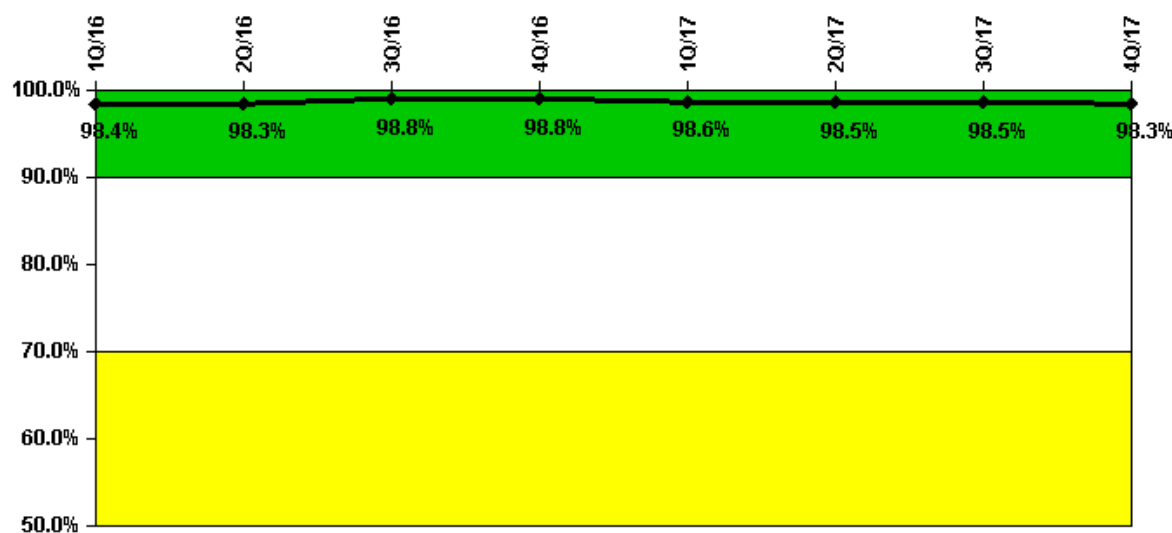
Indicator value	0.6	0.7	1.2	4.1	0.6	0.7	0.9	0.9	0.8	0.7	0.9	0.9
Reactor Coolant System Leakage	1/17	2/17	3/17	4/17	5/17	6/17	7/17	8/17	9/17	10/17	11/17	12/17
Maximum leakage	0.110	0.096	0.085	0.091	0.097	0.103	0.098	0.090	0.112	0.101	0.089	0.069
Technical specification limit	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0	10.0

Indicator value	1.1	1.0	0.9	0.9	1.0	1.0	1.0	0.9	1.1	1.0	0.9	0.7
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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	203.0	3.0	46.0	51.0	90.0	4.0	20.0	55.0
Total opportunities	206.0	3.0	48.0	52.0	92.0	4.0	20.0	55.0

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

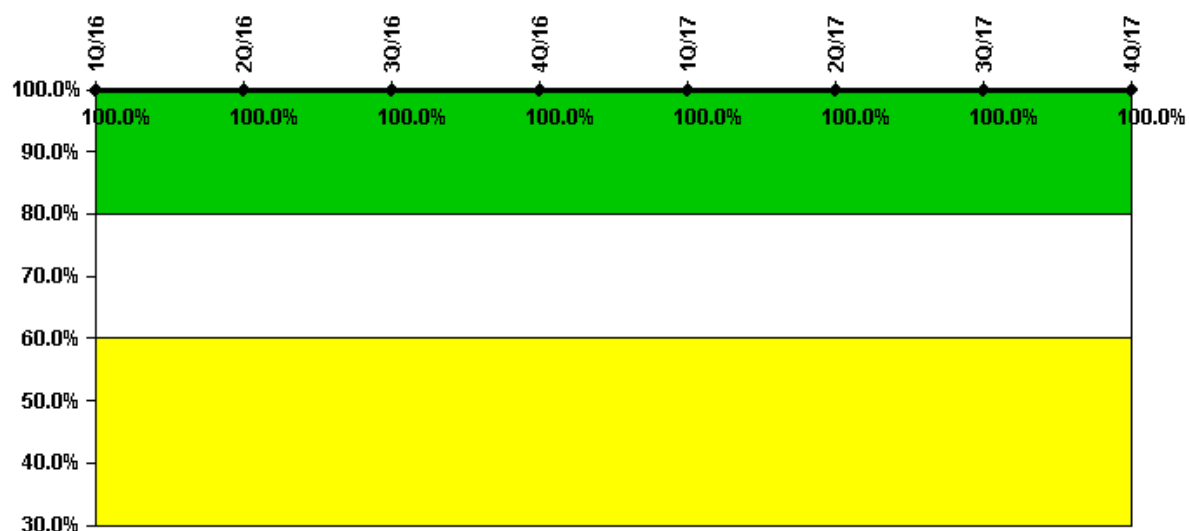
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Licensee Comments:

1Q/17: Updated ERO Drill and Exercise Performance results to include ten opportunities that had been previously left out of the first quarter submittal for January and February 2017. No color change resulted.

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.

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	91.0	95.0	93.0	94.0	91.0	85.0	81.0	77.0
Total Key personnel	91.0	95.0	93.0	94.0	91.0	85.0	81.0	77.0

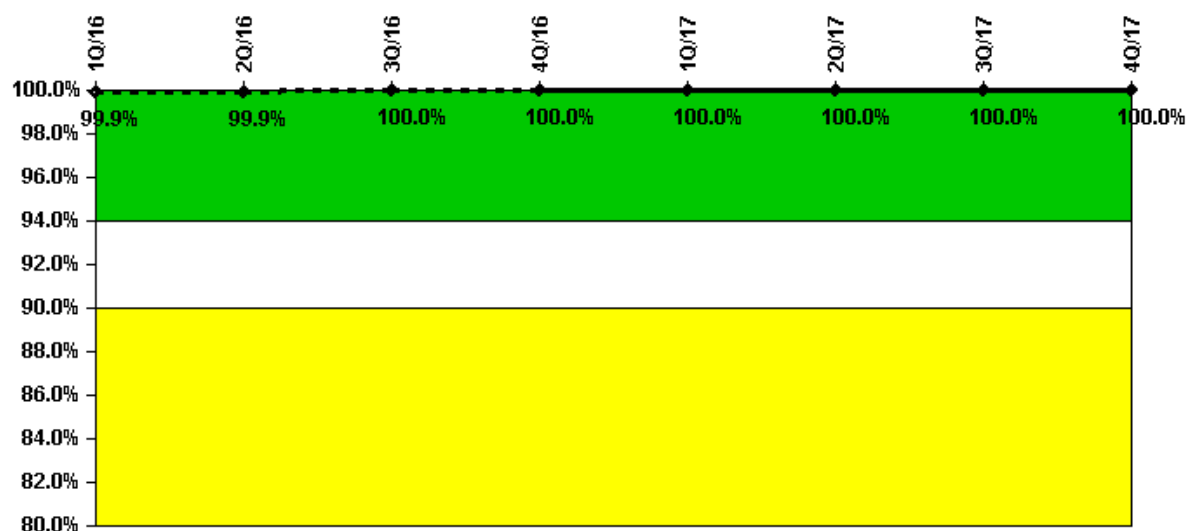
Indicator value **100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0% 100.0%**

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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

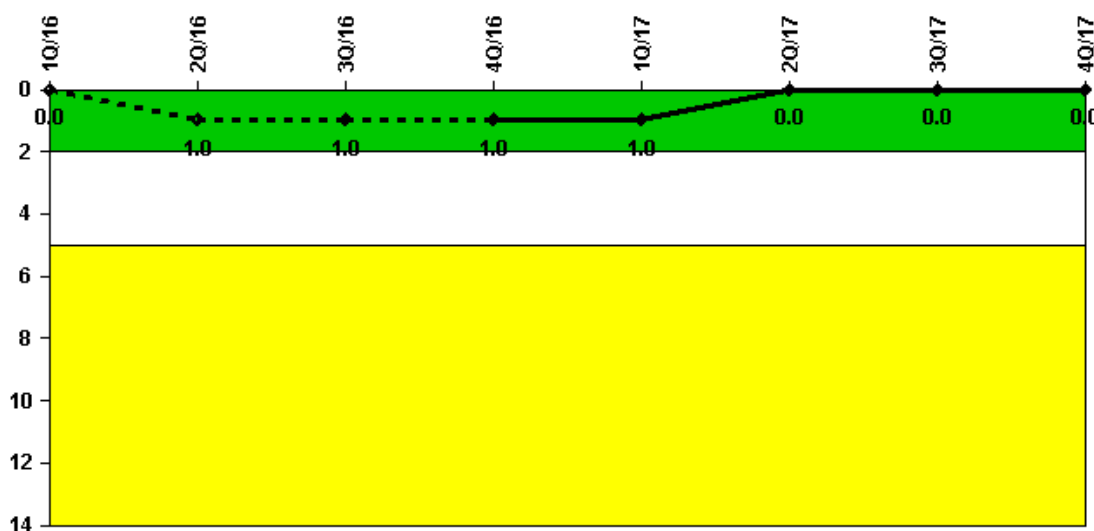
Alert & Notification System	1Q/16	2Q/16	3Q/16	4Q/16	1Q/17	2Q/17	3Q/17	4Q/17
Successful siren-tests	1102	1044	1102	1218	1102	1102	1102	1218
Total sirens-tests	1102	1044	1102	1218	1102	1102	1102	1218

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

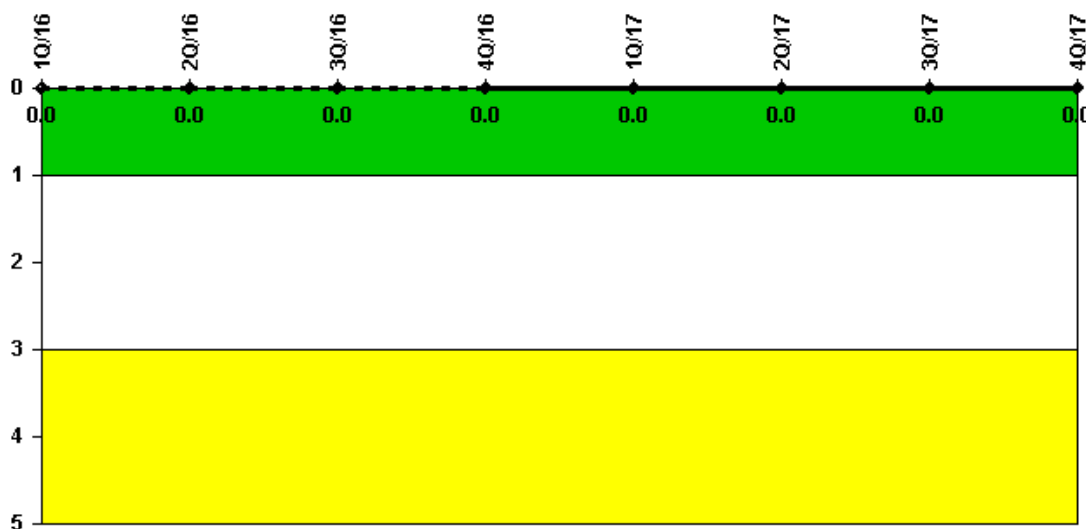
Occupational Exposure Control Effectiveness 1Q/16 2Q/16 3Q/16 4Q/16 1Q/17 2Q/17 3Q/17 4Q/17

High radiation area occurrences	0	1	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	1	1	1	1	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