Enclosure 3
Meeting Summary Handouts
of the January 19, 2012
ROP Public Meeting

NRC Staff White Paper on
Performance Indicator Validity during
Extended Shutdown and Start-Up Conditions

Purpose

This white paper proposes to incorporate guidance into the current revision of NEI 99-02, "Regulatory Assessment Performance Indicator Guideline," for determining performance indicator (PI) validity for plants in extended shutdown conditions, the start-up of plants that were in extended shutdown conditions, and the start-up of new plants for which the PIs in NEI 99-02 will be applicable.

Guidance in NEI 99-02 for determining PI validity would support the ROP objectives of being objective, understandable, and predictable, as well as the NRC objectives of being open and effective. Such guidance would provide a publicly available decision-making framework for determining PI validity during extended shutdowns and plant start-ups. This framework would result in predictable NRC actions and improved effectiveness in communicating PI results to stakeholders and in developing inspection plans for plants.

Background

NEI 99-02 currently provides guidance for determining the applicability or validity of some PIs under certain conditions. However, NEI 99-02 does not provide guidance for determining the validity for other PIs and plant conditions. Plant conditions that would need such determinations include: an extended shutdown, which IMC 0608, "Performance Indicator Program," defines as a condition where the reactor has been subcritical for at least 6 months; the start-up of a plant from an extended shutdown; and the start-up of new plants for which the PIs in NEI 99-02 will be applicable.

Past examples that demonstrate the need for such guidance include the restart of the Browns Ferry Nuclear Plant, Unit 1, the extended shutdown of the Crystal River Nuclear Generating Plant, Unit 3 (CR-3), and plants that were in the oversight process prescribed in IMC 0350, "Oversight of Reactor Facilities in a Shutdown Condition due to Significant Performance and/or Operational Concerns." Future determinations of PI validity will be needed for plants in the IMC 0350 process, plants in the oversight process described in IMC 0351, "Implementation of The Reactor Oversight Process at Reactor Facilities in an Extended Shutdown Condition for Reasons Other Than Significant Performance Problems," the restart of CR-3, and the start-up of new plants for which PIs in NEI 99-02 will be applicable (e.g., Watts Bar Nuclear Plant, Unit 2).

Discussion

<u>IE01: Unplanned Scrams per 7,000 Critical Hours</u>

This indicator measures the rate of unplanned scrams over the previous four quarters. The indicator value is the number of unplanned scrams while critical in the previous four quarters times the ratio of 7,000 hours to the total number of hours critical in the previous four quarters.

NEI 99-02, Revision 6, page 10, lines 25 – 27, states: "If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A ["Not Applicable"] because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned scrams and critical hours) are still reported." This guidance is sufficient for determining validity of this indicator for when a plant enters an extended shutdown.

However, additional guidance is needed for determining exactly when the PI becomes valid for start-up from an extended shutdown and for new plant start-ups.

For plants starting up from an extended shutdown, the NRC staff proposes that the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants, the indicator should become valid when 2400 critical hours are reached and after the ROP takes effect at a new plant. For new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 12 of NEI 99-02 should be revised to reflect this guidance; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after 2400 critical hours are reached.

Recommended Changes to NEI 99-02, Revision 6:

Page 10, lines 25 – 27 (red text is proposed new text):
If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned scrams and critical hours) are still reported. For plants starting up from an extended shutdown, the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants for which this PI will be applicable, the indicator becomes valid when 2400 critical hours are reached and after the ROP takes effect at a new plant.

Page 12, data example and corresponding change to the graph:

Unplanned Scrams per 7,000 Critical Hours *** indicates quarter of new reactor start-up and assumes ROP is already in effect**											
	2Q97*	**3Q97**	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	**~~Prev. Qtr~~ 1Q99**	**2Q99**	**3Q99**	**4Q99**
# of Scrams critical in qtr	1	0	0	1	1	1	2	2	0	0	0
Total Scrams ~~over~~within 4 qtrs	1	0	0	2	2	3	5	6	5	4	2
# of Hrs Crit in qtr	1500	1000	2160	2136	2160	2136	2136	1751	0	0	0
Total Hrs Critical in 4 qtrs	1500	2500	4660	6796	7456	8592	8568	8183	6023	3707	1751
		3Q97	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	**~~Prev. Q~~ 1Q99**	**2Q99**	**3Q99**	**4Q99**
Indicator value	N/A	2.8	1.5	2.1	1.9	2.4	4.1	5.1	5.8	7.55	N/A

IE03: Unplanned Power Changes per 7000 Critical Hours

This indicator measures the rate of unplanned power changes over the previous four quarters. The indicator value is the number of unplanned power changes in the previous four quarters times the ratio of 7,000 hours to the total number of hours critical in the previous four quarters.

NEI 99-02, Revision 6, page 13, lines 35 – 38 state: "If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A ["Not Applicable"] because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned power changes and critical hours) are still reported." This guidance is sufficient for determining validity of this indicator for when a plant enters an extended shutdown. However, additional guidance is needed for determining exactly when the PI becomes valid for start-up from an extended shutdown and for new plant start-ups.

For plants starting up from an extended shutdown, the NRC staff proposes that the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants, the indicator should become valid when 2400 critical hours are reached and after the ROP takes effect at a new plant. For new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 17 of NEI 99-02 should be revised to reflect this guidance; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after 2400 critical hours are reached.

Recommended Changes to NEI 99-02, Revision 6:

Page 13, lines 35 – 38 (red text is proposed new text):
If there are fewer than 2,400 critical hours in the previous four quarters the indicator value is displayed as N/A because rate indicators can produce misleadingly high values when the denominator is small. The data elements (unplanned scrams and critical hours) are still reported. For plants starting up from an extended shutdown, the indicator becomes valid the quarter in which the total number of critical hours within the past four quarters, regardless of the plant operating status during those four quarters, reaches 2400. For new plants for which this PI will be applicable, the indicator becomes valid when 2400 critical hours are reached and after the ROP takes effect at a new plant.

Page 17, data example and conforming change to the graph:

	2Q97*	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	~~Prev. Qtr~~ 1Q99	2Q99	3Q99	4Q99
# of Power Changes in previous qtr	1	0	0	1	2	2	1	3	0	0	0
Total Power Changes in previous 4 qtrs	1	1	1	2	3	5	6	8	6	4	3
# of Hrs Critical in qrtr	1500	1000	2160	2136	2160	2136	2136	1751	0	0	0
Total Hrs Critical in previous 4 qtrs	1500	2500	4660	6796	7456	8592	8568	8183	6023	3707	1751
	2Q97	**3Q97**	**4Q97**	**1Q98**	**2Q98**	**3Q98**	**4Q98**	~~**Prev. Q**~~ **1Q99**	**2Q99**	**3Q99**	**4Q99**
Indicator value	N/A	2.8	1.5	2.1	2.8	4.1	4.9	6.8	7.0	7.6	N/A
*** indicates first quarter of new reactor start-up and assumes ROP is in effect**											

IE04: Unplanned Scrams with Complications (USwC)

This indicator measures the number of unplanned scrams with complications while the reactor was critical during the past four quarters. NEI 99-02 does not provide guidance for determining PI validity for extended shutdown conditions or for start-ups. The data example on page 24 of NEI 99-02 could be misinterpreted to mean that the indicator is not valid until four quarters have elapsed after start-up. For plants that are in extended shutdown conditions, the NRC staff believes the PI should become invalid when the reactor has not been critical for two full quarters. The staff chose two quarters because of the IMC 0608 definition of an extended shutdown and because any scrams that occurred prior to the shutdown would have caused the indicator to reach its maximum value for assessment purposes. If a transient initiates from a sub-critical condition that terminates in a scram after the reactor becomes critical, then the scram would be counted in this indicator, and the PI would become valid again. For a plant restart from an extended shutdown, the PI should be valid the first quarter a reactor becomes critical because the indicator value is not dependent on the number of hours the reactor has

been critical. For new plant start-ups, the PI should be valid the quarter in which the reactor becomes critical and after the ROP takes effect.

Recommended Changes to NEI 99-02, Revision 6:

Page 19, between current guidance at lines 3 and 5:
For plants that are in extended shutdown conditions, the PI becomes invalid (i.e., displayed as "Not Applicable") when the reactor has not been critical for two full quarters. If a transient initiates from a sub-critical condition that terminates in a scram after the reactor becomes critical, then the scram would be counted in this indicator, and the PI becomes valid again the quarter containing the scram. For plants starting up after an extended shutdown, the PI will be valid the first quarter the reactor becomes critical and will include data from the past four quarters in the indicator value. For new plants for which this PI will be applicable, the PI will be valid the quarter in which the reactor becomes critical and after the ROP takes effect.

Page 24, data example and conforming change to the graph:

	1Q05*	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07**	3Q07
# of Scrams with complications	0	1	0	0	1	0	1	0	0	1	0
in prev qtr											
Total over 4 quarters	0	1	1	1	2	1	2	2	1	2	1
	1Q05	2Q05	3Q05	4Q05	1Q06	2Q06	3Q06	4Q06	1Q07	2Q07	3Q07
Indicator value	0	1	1	1	2	1	2	2	N/A	2	1
* indicates 1st quarter criticality is reached and assumes the ROP is in effect for that plant. ** In this example, the reactor was shut down in the middle of 3Q06 and restarted in 2Q07.											

MS05: Safety System Functional Failures

This indicator monitors the number of events or conditions that prevented or could have prevented the fulfillment of the safety function of structures or systems in the previous four quarters. NEI 99-02 does not provide explicit guidance for determining PI validity for extended shutdown conditions or for start-ups. This indicator remains valid during an extended shutdown. The data example on page 30 of NEI 99-02 could be misinterpreted to mean that the indicator is not valid until four quarters have elapsed after a start-up. The indicator should remain valid upon start-up from an extended shutdown. For a new plant, the PI should become valid the quarter in which 10 CFR 50.73 becomes applicable and after ROP is in effect for that plant.

Recommended Changes to NEI 99-02:

Page 29, beginning a new line at 34:
For plants that are in extended shutdown conditions, the PI remains valid. For a subsequent start-up from an extended shutdown, the PI continues to be valid, and the total SSFFs from the previous four quarters continue to be reported data elements and included in the indicator value. For new plants for which this PI will be applicable, the PI will be valid the first quarter in which 10 CFR 50.73 becomes applicable and after ROP is in effect for that plant.

Page 30, data example and conforming change to the graph:

Quarter	2Q98*	3Q98	4Q98	1Q~~89~~99	2Q~~89~~99**	3Q~~89~~99	4Q~~89~~99	~~Prev. Q~~ 1Q00**	2Q00
SSFF in ~~the previous~~that qtr	1	3	2	1	1	2	0	1	0
	2Q98	3Q98	4Q98	1Q~~89~~99	2Q~~89~~99	3Q~~89~~99	4Q~~89~~99	~~Prev. Q~~ 1Q00	2Q00
Indicator: Number of SSFFs over 4 Qtrs	1	4	6	7	7	6	4	4	3
* indicates 1st quarter in which both 10 CFR 50.73 and ROP are both in effect for that plant. ** In this example, the reactor was shut down in 2Q99 and restarted in 1Q00.									

MS06, MS07, MS08, MS09, MS10: Mitigating System Performance Index (MSPI)

These PIs monitor the performance of selected systems based on their ability to perform risk-significant functions. The MSPI is the sum of the changes in a simplified core damage frequency evaluation resulting from differences in unavailability and unreliability relative to industry standard baseline values. The MSPI is supplemented with system component performance limits. An unavailability index (UAI), unreliability index (URI), and a determination as to whether a system exceeded its component performance limits are reported data elements.

NEI 99-02 currently does not provide guidance for determining MSPI validity during extended shutdowns, start-ups from extended shutdowns, or for new plant restarts. The UAI is dependent on the number of critical hours over a 12-quarter period. Both the UAI and URI consider the past 12 quarters of data.

Proposed guidance for extended shutdown conditions, start-ups from extended shutdowns, and new plant start-ups is provided as an attachment to this white paper.

BI01: Reactor Coolant System (RCS) Specific Activity

This indicator monitors the maximum monthly RCS activity in accordance with Technical Specifications (TS) and is expressed as a percentage of the TS limit. The indicator is determined by multiplying 100 by the ratio of the maximum monthly value of calculated activity to the TS limit. The indicator is not dependent on the number of critical hours. A plant's TS specify the modes in which the specific activity shall be within limits.

Current NEI 99-02 Guidance for PI Validity: NEI 99-02, Revision 6, page 38, lines 27 – 29 state, "If in the entire month, plant conditions do not require RCS activity to be calculated, the data field is left blank for that month and the status "Final – N/A" is selected." The staff believes the current guidance in NEI 99-02 is sufficient for determining PI validity for extended shutdown conditions. The data example on page 39 of NEI 99-02 could not be interpreted to mean that the indicator is invalid until a certain time has elapsed after start-up; therefore, the staff believes the current guidance is sufficient for determining that the PI remains valid as a plant starts up from extended shutdown conditions. For a new plant, the PI should become valid when the ROP is in effect for that plant and the applicable modes for the RCS specific activity TS requirements are entered.

The staff does not believe that additional guidance is not needed in NEI 99-02 for extended shutdown conditions or subsequent start-ups; however, a clarifying note on page 38 of NEI 99-02 should be added at line 29 that states, "For a new plant for which this PI is applicable, the PI becomes valid when the ROP is in effect for that plant and the applicable modes for the RCS specific activity TS requirements are entered."

BI02: Reactor Coolant System Leakage

This indicator monitors the maximum monthly RCS leakage in accordance with Technical Specifications (TS) and is expressed as a percentage of the TS limit. The indicator is determined by multiplying 100 by the ratio of the maximum monthly value of identified (or total) leakage to the TS limit. The indicator is not dependent on the number of critical hours. A plant's TS specify the modes in which the leakage shall be within limits.

NEI 99-02, Revision 6, page 40, lines 37 – 39, states, "If in the entire month, plant conditions do not require RCS leakage to be calculated, the data field is left blank for that month and the status "Final – N/A" is selected[.]" The staff believes the current guidance in NEI 99-02 is sufficient for determining PI validity for extended shutdown conditions. The data example on page 42 of NEI 99-02 could not be interpreted to mean that the indicator is invalid until a certain time has elapsed after start-up; therefore, the staff believes the current guidance is sufficient for determining that the PI remains valid as a plant starts up from extended shutdown conditions. For a new plant, the PI should become valid when the ROP is in effect for that plant and the applicable modes for the RCS leakage TS requirements are entered.

The staff does not believe that additional guidance is not needed in NEI 99-02 for extended shutdown conditions or subsequent start-ups; however, a clarifying note on page 40 of NEI 99-02 should be added at line 39 that states, "For a new plant for which this PI will be applicable, the PI becomes valid when the ROP is in effect for that plant and the applicable modes for the RCS leakage TS requirements are entered."

EP01: Drill/Exercise Performance

This indicator monitors timely and accurate licensee performance in emergency preparedness (EP) drills, exercises, and actual events when presented with opportunities for classification of emergencies, notification of offsite authorities, and development of protective action recommendations (PARs). The indicator is calculated as a ratio (expressed as a percent) of the number of timely and accurate classifications, notifications, and PARs during the previous eight quarters to the total number of opportunities to perform these actions during the previous eight quarters.

NEI 99-02 does not provide explicit guidance for determining PI validity for extended shutdown conditions or for start-ups. The data example on page 49 of NEI 99-02 could imply that the indicator is not valid until eight quarters have elapsed after a start-up. This indicator should remain valid during an extended shutdown because drills, exercises, or actual events will or could still occur. The indicator should remain valid upon start-up from an extended shutdown with no interruption or reset in reporting.

For a new plant at an existing site (for which the indicator will be applicable), the indicator should be valid the first quarter after the ROP takes effect without any grace period if the indicator is reported as a site-wide value rather than calculated separately per unit (i.e., the site has one emergency response organization (ERO) for all units).

For a new plant at an existing site (for which the indicator will be applicable), the indicator should be valid the fourth full quarter after the ROP takes effect if the new unit's ERO is separate from the other unit's/units' ERO. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit.

For a new plant at a new site (for which the indicator will be applicable), the indicator should be valid the fourth full quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit.

Recommended Changes to NEI 99-02, Revision 6:

Page 48, line 14:
This indicator remains valid during extended shutdowns and upon subsequent start-ups with no interruption or reset in calculations and reporting.

For a new plant (for which the indicator will be applicable) at an existing site, the indicator will be valid the first quarter after the ROP takes effect if the site has one emergency response organization (ERO) for all units.

For a new plant (for which the indicator will be applicable) at an existing site, the indicator will be valid the fourth full quarter after the ROP takes effect if the new unit's ERO is separate from the other unit's/units' ERO. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit and start reporting the overall indicator value for the fourth full ROP quarter.

For a new plant (for which the indicator will be applicable) at a new site, the indicator will be valid the fourth full quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit and start reporting the overall indicator value for the fourth full ROP quarter.

Page 49, data example, conforming changes to the chart, and thresholds table:

	3Q96*	4Q96	1Q97	2Q97	3Q97	4Q97	1Q98	2Q98	3Q98
Successful classifications, notifications ,& PARs over qtr	0	0	11	11	0	8	10	0	23
Opportunities to perform classifications, notifications, & PARs in 8 qtrs	0	0	12	12	0	12	12	0	24
Total # of successful classifications, notifications, & PARs in 8 qtrs	0	0	11	22	22	30	40	40	63
Total # of opportunities to perform classifications, notifications, & PARs in 8 qtrs	0	0	12	24	24	36	48	48	72
	3Q96*	**4Q96**	**1Q97**	**2Q97**	**3Q97**	**4Q97**	**1Q98**	**2Q98**	**3Q98**
Overall Indicator value (expressed as a percentage)	N/A	N/A	N/A	91.7%	91.7%	83.3%	83.3%	83.3%	87.5%
*** indicates 1st full quarter after ROP was applicable at a new plant at a new plant at a new site (or a new plant with a separate ERO)**									

Thresholds	
Green	≥ 90.0%
White	< 90.0%
Yellow	< 70.0%
Red	N/A

EP02: Emergency Response Organization (ERO) Drill Participation

This indicator monitors the participation of ERO members assigned to fill key positions in EP performance-enhancing experiences. The indicator is calculated as a ratio (expressed as a percent) of the number of ERO members assigned to key positions that have participated in drills, exercises, or actual events during the previous eight quarters to the total number of key positions assigned to ERO members.

NEI 99-02 does not provide explicit guidance for determining PI validity for extended shutdown conditions or for start-ups. The data example on page 55 of NEI 99-02 could imply that the indicator is not valid until eight quarters have elapsed after a start-up. This indicator should remain valid during an extended shutdown because drills, exercises, or actual events will and/or

could still occur. The indicator should remain valid upon start-up from an extended shutdown with no interruption or reset in reporting.

For a new plant at an existing site (for which the indicator will be applicable), the indicator should be valid the first quarter after the ROP takes effect without any grace period if the indicator is reported as a site-wide value rather than calculated separately per unit (i.e., the site has one emergency response organization (ERO) for all units).

For a new plant at an existing site (for which the indicator will be applicable), the indicator should be valid the fourth full quarter after the ROP takes effect if the new unit's ERO is separate from the other unit's / units' ERO. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit.

For a new plant at a new site (for which the indicator will be applicable), the indicator should be valid the fourth full quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit.

Recommended Changes to NEI 99-02, Revision 6:

Page 54, line 4:
This indicator remains valid during extended shutdowns and upon subsequent start-ups with no interruption or reset in calculations and reporting.

For a new plant (for which the indicator will be applicable) at an existing site, the indicator will be valid the first quarter after the ROP takes effect if the site has one emergency response organization (ERO) for all units.

For a new plant (for which the indicator will be applicable) at an existing site, the indicator will be valid the fourth full quarter after the ROP takes effect if the new unit's ERO is separate from the other unit's/units' ERO. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit and start reporting the overall indicator value for the fourth full ROP quarter.

For a new plant (for which the indicator will be applicable) at a new site, the indicator will be valid the fourth full quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit and start reporting the indicator value for the fourth full ROP quarter.

Page 55, data example and conforming changes to the chart:

Quarter	*3Q96	4Q96	1Q97	2Q97	3Q97	4Q97	1Q98	2Q98	3Q98	…
Total # of key ERO personnel	56	56	56	56	56	56	56	56	56	…
# of key personnel participating in drill/event in 8 qtrs	10	20	30	45	45	48	48	48	52	…
	3Q96*	4Q96	1Q97	2Q97	3Q97	4Q97	1Q98	2Q98	3Q98	…
Overall Indicator value (expressed as a percentage)	N/A	N/A	N/A	80%	80%	86%	86%	86%	93%	…
* indicates 1st full quarter after ROP was applicable at a new plant at a new site										

EP03: Alert and Notification System Reliability

This indicator monitors the reliability of the offsite ANS and is a percentage of the sirens that are capable of performing their safety function. The indicator is calculated as the ratio (expressed as a percentage) of the number of successful siren-tests in the previous four quarters to the total number of siren-tests in the previous four quarters.

NEI 99-02 does not provide explicit guidance for determining PI validity for extended shutdown conditions or for start-ups. The data example on page 60 of NEI 99-02 could imply that the indicator is not valid until four quarters have elapsed after a start-up.

This indicator should remain valid during an extended shutdown because the potential need for alerting the public still exists during extended shutdowns. The indicator should remain valid upon start-up from an extended shutdown with no interruption or reset in reporting.

For a new plant at an existing site (for which the indicator will be applicable), the indicator should be valid the fourth full quarter after the ROP takes effect if the new unit's ANS is separate from the other unit's / units' ANS. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit.

For a new plant at an existing site (for which the indicator will be applicable), the indicator should be valid the first quarter after the ROP takes effect, without any grace period if the indicator is reported as a site-wide value rather than calculated separately per unit.

For a new plant at a new site (for which the indicator will be applicable), the indicator should be valid the fourth full quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit. FEMA requires 12 months of testing with greater than 90% success rate before it considers an approved the siren system operable. The completed FEMA data will be used, to the extent it is available, and the PI is to be considered valid 12 months from the beginning of the FEMA testing, unless there has been ANS testing post-FEMA acceptance for the new plant.

Recommended Changes to NEI 99-02, Revision 6:

Page 59, line 18:
This indicator remains valid during extended shutdowns and upon subsequent start-ups with no interruption or reset in reporting.

For a new plant (for which the indicator will be applicable) at an existing site, the indicator will be valid the first quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit and start reporting the overall indicator value for the fourth full ROP quarter.

For a new plant (for which the indicator will be applicable) at a new site, the indicator will be valid the fourth full quarter after the ROP takes effect. The licensee should still report the data elements minus the overall indicator value beginning the first quarter after the ROP is in effect for that unit and start reporting the indicator value for the fourth full ROP quarter. FEMA operability testing results will be used, to the extent it is available, to establish the four-quarter average if the ROP takes effect prior to or upon completion of the FEMA operability testing.

Page 60, data example and conforming change to the graph:

Quarter	3Q97*	4Q97*	1Q98*	2Q98*	3Q98**	4Q98	Prev. Q
Number of successful siren-tests in the qtr	47	48	49	49	49	54	52
Total # of sirens tested in the qtr	50	50	50	50	50	55	55
# of successful siren-tests over 4 qtrs	47	95	144	193	195	201	204
Total # of sirens tested over 4 qtrs	50	100	150	200	200	205	210
	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
Overall Indicator expressed as a percentage of sirens	N/A	N/A	N/A	N/A~~96.5%~~	97.5%	98.0%	97.1%
* indicates siren testing results for FEMA approval of siren system ** indicates 1st quarter after ROP is applicable at a new plant at a new site.							

OR01: Occupational Exposure Control Effectiveness

This indicator sums the number of occurrences for each of the following three data elements over the previous four quarters at the site.

- The number of TS high radiation area occurrences during the previous quarter
- The number of very high radiation area occurrences during the previous quarter
- The number of unintended exposure occurrences during the previous quarter

This indicator does not depend on the operational status of the plant (e.g., critical hours) and is intended to be valid during extended shutdowns and subsequent start-ups. The current guidance is sufficient for extended shutdown conditions. For start-ups after extended shutdowns and for new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 66 of NEI 99-02 should be revised to reflect this; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after start-up have elapsed.

Recommended Changes to NEI 99-02:

Page 65, line 28:
For a new plant for which this PI will be applicable, this PI becomes valid the quarter the ROP is applicable to the plant.

Page 66, data example and conforming changes to the graph:

Quarter	3Q95*	4Q95	1Q96	2Q96	3Q96	4Q96	1Q97	2Q97	3Q97	4Q97	…	…
Number of TS HRA occurrences during the quarter	0	0	3	0	0	0	0	0	0	0	…	…
Number of very HRA occurrences during the quarter	0	0	0	0	0	0	1	0	1	0	…	…
Number of unintended exposure occurrences during the quarter	1	0	0	0	0	0	0	0	0	0	…	…
Reporting Quarter	3Q95	4Q95	1Q96	2Q96	3Q96	4Q96	1Q97	2Q97	3Q97	4Q97	…	…
Total # of occurrences in the previous 4 qtrs	1	1	4	4	3	3	1	1	2	2	…	…
* indicates 1st quarter in which indicator becomes valid.												

PR01: REST/ODCM Radiological Effluent Occurrence

This indicator calculates the number of RETS/ODCM radiological effluent occurrences (dose rates from liquid and gaseous effluents that exceed rates listed in NEI 99-02) per site in the previous four quarters. This indicator is independent of the operational status of the plant (e.g., critical hours) and is intended to be valid during extended shutdowns and subsequent start-ups. The current guidance is sufficient for extended shutdown conditions. For start-ups after

extended shutdowns and for new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 69 of NEI 99-02 should be revised to reflect this; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after start-up have elapsed.

Recommended Changes to NEI 99-02:

Page 68, line 17:
For a new plant for which this PI will be applicable, this PI becomes valid the quarter the ROP is applicable to the plant.

Page 69, data example, conforming changes to the graph, and thresholds table:

RETS/ODCM Radiological Effluent Indicator							
Quarter	3Q97*	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
Number of RETS/ODCM occurrences in the qtrs	1	0	0	1	0	0	1
Reporting Quarter	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
Number of RETS/ODCM occurrences in the previous 4 qtrs	1	1	1	2	1	1	2
* indicates 1st quarter in which indicator becomes valid.							

Thresholds	
Green	≤ 1
White	> 1
Yellow	> 3
Red	N/A

PP01: Protected Area (PA) Security Equipment Performance Index

This indicator monitors the availability of security equipment. The PI value is the sum of two indices divided by two. The two indices are the number of compensatory hours (the hours a guard needs to be posted because of the unavailability of security equipment) in the previous four quarters divided by the product of a normalization factor and 8760 hours. This indicator is independent of the operating mode of the plant and is intended to be valid during extended shutdowns and subsequent start-ups. The current guidance is sufficient for extended shutdown conditions. For start-ups after extended shutdowns and for new plant start-ups, a total of four quarters after start-up would not need to elapse in order for the data to be valid; data can be valid prior to completing four quarters after start-up. The data example on page 77 of NEI 99-02 should be revised to reflect this; otherwise, it could be misinterpreted to mean that the indicator is not valid until four quarters after start-up have elapsed.

Recommended Changes to NEI 99-02:

Page 76, line 37:
PI Validity: For a new plant for which this PI will be applicable, this PI becomes valid the quarter the ROP is applicable to the plant.

Page 77, data example, conforming changes to the graph, and thresholds table:

[Note, the number of significant digits needs to be corrected throughout the table.]

Quarter	2Q97*	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
IDS Compensatory Hours in the qtr	36	48	96	126	65	45	60	55
CCTV Compensatory Hours in the qtr	24	36	100	100	48	56	53	31
IDS Compensatory Hrs in previous 4 qtrs	36	84	180	306	335	332	296	225
CCTV Compensatory Hrs in previous 4 qtrs	24	60	160	260	284	304	257	188
IDS Normalization Factor	1.05	1.05	1.05	1.05	1.1	1.1	1.1	1.1
CCTV Normalization Factor	1.2	1.2	1.2	1.2	1.3	1.3	1.3	1.3
IDS Unavailability Index	0.003914	0.009132	0.01957	0.033268	0.034765	0.034454	0.030718	0.02335
CCTV Unavailability Index	0.002283	0.005708	0.01522	0.024734	0.024939	0.026695	0.022568	0.016509
Reporting Quarter	2Q97	3Q97	4Q97	1Q98	2Q98	3Q98	4Q98	Prev. Q
Indicator Value	0.0031	0.0074	0.017	0.0329	0.030	0.031	0.0327	0.020
* indicates 1st quarter in which indicator becomes valid.								

Thresholds	
Green	≤0.080
White	>0.080
Yellow	N/A
Red	N/A

Changes to NEI 99-02, Appendix B, to account for N/A values

To be determined at a later date.

Proposed MSPI Outage/Start-up Schemes

Scheme	Gap	Limit 2 Quarters	Limit 6 Quarters	Generic
Applicability				
Extended Outages	Yes	Yes	Yes	Yes
New Plants Start-up	No	Yes	Yes	Yes
Performance				
Artificial Degradation (3-year active data window maintained)	Small	Moderate	Large	None
Sensitivity (replacement data decreases effectiveness)	Good	Good	Good	Moderate to Large
Invalid Period (length of time where data is not available)	Small	Large	Moderate	Small
Early Trend (ability to provide indication of performance when data is available)	Good	Poor	Moderate	Good
Implementation (difficulty to implement)	Complex	Simple	Simple	Simple

Gap Approach

The MSPI would be considered invalid for any full calendar quarter that a plant is in an outage or shutdown; however, a full 3-year rolling average would be maintained by considering quarters prior to the 3-year window. Full calendar quarters of outage/shutdown would not be considered in the indicator. Previous quarters with operational data would continue to be considered, which would extend the overall time consideration to more than 3 years. This approach would not be applicable to new plant start-ups because no data exist prior to start-up.

For example, assume a 6-month outage starting in February and ending in August. The 2nd calendar quarter (2Q) would be a full calendar quarter in which the plant was in an outage. The 2Q data results would be reported as "N/A" and would be grayed out on the NRC's Web site.

The data elements minus the overall indicator would still be reported. The 3Q data would be reported as if 2Q did not exist. Any failures occurring during 2Q would become inspection samples. To maintain 12 quarters of data, the MSPI would use data from quarters prior to the current 3-year window. In this case, MSPI would have a 3.25-year "look back" period until 2Q (the outage quarter) drops off.

CDE would have to be configured (or a work around would have to be put in place) to allow skipping or "gapping" quarters. Performance prior to the outage should be unchanged from that after the outage.

This approach provides a good indication of performance by minimizing the time when the indicator is not applicable; however, it is not applicable during new plant start-up conditions. The approach maintains a 3-year rolling average, which minimizes artificial degradation of the indicator. A worst-case scenario of 6 months of degradation (where 6 months of outage time would be included in the indicator) would be an outage that starts the day after a calendar quarter begins and ends on day before the next quarter ends.

Limit Approach

In this approach, MSPI would be considered valid for x quarters (a limit) after a plant shuts down. Upon subsequent start-up and for new plant start-ups, the MSPI would be considered valid (12-x) quarters after the plant starts up.

An assumption used in this approach is that if the MSPI becomes invalid x quarters after shutdown, then the indicator is valid with 12-x quarters of operation. A smaller limit value for x would result in a smaller number of quarters in which the PI would artificially degrade (because of decreasing number of critical hours) after a shutdown. However, a smaller limit value would mean a longer amount of time would have to elapse before considering the indicator valid again. A larger limit value would result in a larger number of quarters in which the PI would artificially degrade after a shutdown; however, less time would be needed to consider the PI valid again after a start-up.

Changes to CDE are assumed to be minimal. The data elements reported to NRC would have to include a value or character for "N/A" so that the PI turns gray on the website. Inspection samples may be needed for failures that occur while the MSPI is N/A.

Generic Approach

In this approach, any full quarter in which the plant was shut down receives baseline data values. These values might need to be modified based on any equipment failures or unavailability during shutdown conditions. For new plant starts, the indicator is valid immediately using generic data if available. This approach allows for early trending of performance and maintains a 3-year window. The indicator would never be invalid. However, the generic baseline data may not be representative of actual performance.

Changes to CDE are assumed to be minimal.

Tentative NRC Response to
FAQ 11-12, FitzPatrick Downpowers

Plant: James A. FitzPatrick Nuclear Power Plant

Date of Event: June 7, 2011 & June 9, 2011

Submittal Date: Introduced October 26, 2011

Licensee Contact: Gene Dorman 315-349-6810 / gdorman@entergy.com

NRC Contact: Ed Knutson 315-349-6667 / edward.knutson@nrc.gov

Performance Indicator: Unplanned Power Changes per 7,000 Critical Hours

Site-Specific FAQ (Appendix D): (YES) / ~~NO~~

FAQ requested to become effective when approved or _____.

Question

Downpowers were performed on June 7 & 9, 2011 as a result of marine fouling of the main condenser waterboxes during a maintenance activity.

NEI 99-02 Rev 6 Guidance

Page 14; lines 42 – 47

Page 15; lines 1 – 15

Anticipated power changes greater than 20% in response to expected environmental problems (such as accumulation of marine debris, biological contaminants, animal intrusion, environmental regulations, or frazil icing) may qualify for an exclusion from the indicator. The licensee is expected to take reasonable steps to prevent intrusion of animals, marine debris, or other biological growth from causing power reductions. Intrusion events that can be anticipated as a part of a maintenance activity or as part of a predictable cyclic behavior would normally be counted, unless the downpower was planned 72 hours in advance or the event meets the guidance below.

In order for an environmental event to be excluded, any of the following may be applied:

If the conditions have been experienced before and the exhibit a pattern of predictability or periodicity (e.g., seasons, temperatures, weather events, animal, etc.), the station must have a monitoring procedure in place or make a permanent modification to prevent recurrence for the event to be considered for exclusion from the indicator. If monitoring identifies the condition, the licensee must have implemented a proactive procedure (or procedures) to specifically address mitigation of the condition before it results in impact to operation. This procedure cannot be a general Abnormal Operating Procedure (AOP) or Emergency Operating Procedure (EOP) addressing the symptoms or consequences of the condition (e.g., low condenser vacuum); rather it must be a condition-specific that directs actions to be taken to address the specific environmental conditions (e.g., jellyfish, gracilaria, frazil ice, etc.)

Event or Circumstances

On June 6, 2011, a first time Preventive Maintenance (PM) activity was performed on the traveling water screens. In order to support the PM, gates were installed in the intake structure to isolate the screen being maintained. Based on prior operating experience at the plant, prior to this activity cleaning of the accessible portions of the intake structure was performed and

the condition of the condenser was monitored in accordance with Circulating Water System Operating Procedure, OP-4 (Reference 1 in transmittal e-mail) to determine if the condenser was being negativity impacted and a contingency downpower was scheduled for condenser flushing if necessary.

Within 24 hours of installing the gates the condenser water box differential temperature increased to a point where a downpower was initiated to perform a backwashing operation in accordance with Circulating Water System Operating Procedure, OP-4 Section G.6. The initial backwashing operation was conducted on June 7, 2011. Because fouling had been recognized as a possibility when the work was planned, based on past experience with inserting the gates, and contingency plans and monitoring were in place the activity continued. As the PM activity continued, a second backwashing operation was required on June 9, 2011, based on the condenser differential temperature.

The Resident Inspector agrees with the facts of the FAQ but believes that the downpowers should count against the indicator.

Background:

Past experience with installing gates in the intake structure has demonstrated that condenser fouling may occur. This has been attributed to changes in the flow characteristics in the forebay resulting in debris in the forebay being transported to the condensers resulting in condenser fouling. In order to minimize the probability of fouling, divers cleaned the accessible portions of the forebays the week before the PM in question was scheduled.

Because past experience with installing flow gates in the intake structure had resulted in biological fouling of the condenser OP-4 was revised to include system monitoring parameters and specific guidance on addressing the fouling. As noted above this guidance is contained in Section G.6 of the procedure. Since fouling of the condenser is not certain and is not absolutely predictable a contingency for down power was included in the weekly work schedule.

The travelling water screens were replaced in 2008 and 2009 to address a problem with cladaphora algae in Lake Ontario. Since replacement there has been no carryover observed through the windows on the north side (Lake Ontario side) of the screens. Therefore, debris was thought to have been effectively removed by the sprays.

The travelling water screens have a cement filled boot below the screens that runs down to the intake bay (see Diagram 1 below). Due to this design, the annual PM now includes a boot inspection. It was to support this inspection that the gates were inserted.

The PM work order, MP-036.03 (Reference 2 in transmittal e-mail), includes a step that addresses cleaning of the intake bay. Step 7.8 states, “IF the intake canal is scheduled for cleaning, THEN PRIOR to lowering gates to isolate screen, intake bay must be cleaned of debris that can wash into circulating water pumps and main condensers.” The vendor information provided with the new traveling water screens, that was used to develop the PM, did not include any information related to potential build-up of marine debris downstream of the screens. Review of industry Operating Experience did not identify any industry OE relative to this condition.

Based on the need to downpower the unit JAF performed an apparent cause evaluation and determined that the fouling observed was from a previously unidentified source. Based on the design of the boot and the cement, it appears that a low flow area may be forming just past the

boot. There is a possibility for small debris such as silt, sand, and broken zebra mussel shells to settle in this area south of the screens (pump suction side). In this area, the silt may settle out past the boots and build up to a level to meet up with the process flow. This condition would only take a short period of time to build-up and then would remain in the condition until cleaning could remove the debris.

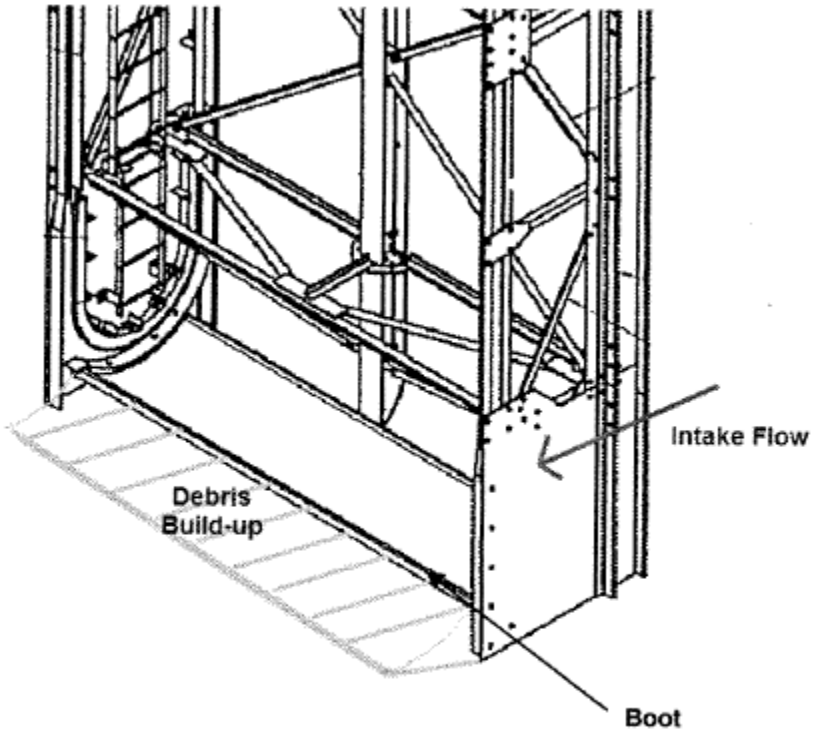

Diagram 1: Low flow area with debris build-up behind Boot

During normal operation, this debris build-up is not a significant threat to fouling because the debris is settled. However, this area becomes vulnerable when the gates are installed because of the change in flow patterns and increased velocity.

As noted above to minimize the impact of the marine debris buildup in the forebay, the annual cleaning and inspection of the intake canals was performed the week prior to the annual PM to inspect the travelling water screen boot. The cleaning included the areas of the forebay from the tempering gate to the trash racks and the area between the trash racks and the screens. However, due to the configuration of the traveling screens, pump bays, and isolation gates (see Diagram 2 below), the area south of the screens was not cleaned because it is not accessible during operation.

During the maintenance activities beginning on 6/6/2011, the south gate was inserted to provide protection for the divers. The installation of the gate caused an increase in flow, which apparently caused the settled debris in the vicinity of the gate to be picked up by localized turbulence, resulting in fouling of the condenser. The apparent cause evaluation postulated

that the turbulence could be reduced by inserting the gate north of the travelling water screens prior to installing the gate south of the travelling water screens.

Based on the apparent cause evaluation corrective actions have been proposed to 1) incorporate additional guidance in OP-4, Circulating Water System regarding the sequence for installing gates; and 2) to evaluate the PM task for scheduling optimization.

Potentially Relevant FAQs

FAQ #469 – 3/18/2010, Page 19

Anticipated power changes greater than 20% in response to expected environmental problems (such as accumulation of marine debris, biological contaminants, or frazil icing) which are proceduralized but cannot be predicted greater than 72 hours in advance may not need to be counted unless they are reactive to the sudden discovery of off-normal conditions. However, unique environmental conditions which have not been previously experienced and could not have been anticipated and mitigated by procedure or plant modification, may not count, even if they are reactive. The licensee is expected to take reasonable steps to prevent intrusion of marine or other biological growth from causing power reductions. Intrusion events that can be anticipated as part of a maintenance activity or as part of a predictable cyclic behavior would normally be counted unless the down power was planned 72 hours in advance. The circumstances of each situation are different and should be identified to the NRC in a FAQ so that a determination can be made concerning whether the power change should be counted.

Response

As stated in NEI 99-02 on page 15 lines 4 – 15 “If the conditions have been experienced before and the exhibit a pattern of predictability or periodicity (e.g., seasons, temperatures, weather events, animal, etc.), the station must have a monitoring procedure in place or make a permanent modification to prevent recurrence for the event to be considered for exclusion from the indicator. If monitoring identifies the condition, the licensee must have implemented a proactive procedure (or procedures) to specifically address mitigation of the condition before it results in impact to operation. This procedure cannot be a general Abnormal Operating Procedure (AOP) or Emergency Operating Procedure (EOP) addressing the symptoms or consequences of the condition (e.g., low condenser vacuum); rather it must be a condition-specific that directs actions to be taken to address the specific environmental conditions (e.g., jellyfish, gracilaria, frazil ice, etc.)”

These downpower events should be excluded from the indicator. The licensee had experienced condenser fouling with the original traveling water screen design and although the travelling water screens had been replaced with a new design that previous operating experience was considered in planning the work on the new screens. The licensee took reasonable steps to prevent intrusion by cleaning the forebays and provided normal operating procedural guidance for monitoring condenser differential temperatures and backwashing the condenser water boxes. Since this was the first time the boot inspections had been performed, there was no way to reasonably anticipate that the debris south of the travelling water screens would have been sufficient to cause the observed condenser fouling. In addition, the on-line schedule for that week had a contingency action to perform a downpower in order to support backwashing activities. This was shown as a contingency because there is no way to accurately predict if the condenser will foul or the speed with which it will reach a point requiring a downpower.

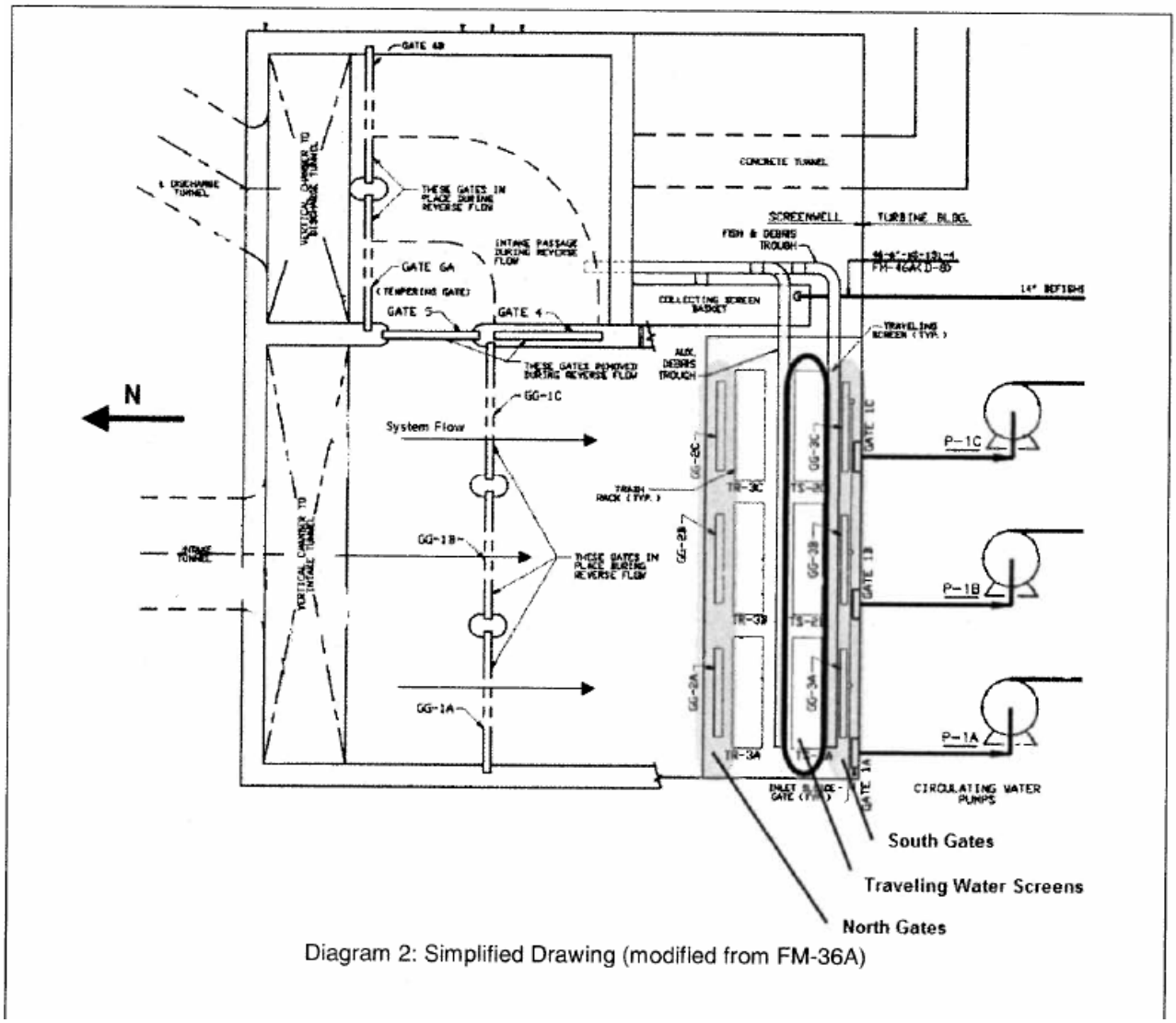

Diagram 2: Simplified Drawing (modified from FM-36A)

Tentative NRC Response:

NEI 99-02, Rev. 6, page 14, beginning with line 36, states, "Intrusion events that can be anticipated as a part of a maintenance activity or as part of a predictable cyclic behavior would normally be counted, unless the downpower was planned 72 hours in advance or the event meets the guidance below."

Although the licensee may have been aware that condenser fouling during the maintenance or inspection activity could potentially cause a downpower, the licensee was not planning to downpower to conduct the maintenance/inspection. The licensee stated in the FAQ that it could not reasonably anticipate that the debris south of the travelling water screens would have been sufficient to cause the observed condenser fouling. This statement indicates that the licensee was not planning to downpower. Therefore, the staff considers the downpowers to be unplanned.

Tentative NRC Response to
FAQ 11-12, FitzPatrick Downpowers

NEI 99-02 has guidance for allowing contingency downpowers under certain conditions (page 14, lines 6-8) and anticipatory downpowers in response to certain external events (page 14, lines 38-40) and environmental events (page 14, lines 42-47, and page 15, lines 1 – 29). The external and environmental event guidance reflects situations that are not caused by the licensee and for which the licensee cannot predict or control the timing. Although marine debris is environmental matter, the licensee's action of closing the gates created new flow patterns that transported the debris into the condenser, which has happened at this site in the past. NRC staff does not consider this situation to qualify for the contingency or external or environmental event exclusions in NEI 99-02.

NEI 99-02 also states that the licensee is expected to take reasonable steps to prevent intrusion of animals, marine debris or other biological growth from causing power reductions. Although the licensee cleaned the intake structure area prior to the maintenance, the NRC resident inspector identified licensee condition reports that indicated that several inches of debris were south of the traveling screens some time after installation of the new screens. Based on similar occurrences of this amount of debris causing condenser fouling in the past, the staff believes the condenser fouling could reasonably have been anticipated.

NEI 99-02 states that intrusion events that can be anticipated as a part of a maintenance activity would normally be counted. The staff believes these events could have been anticipated and that the exclusions provided in NEI 99-02 were not applicable. The staff's decision is that the downpowers should have been counted in the PI.